The Age of Interactivity:
An historical analysis of public discourses on interactivity in Ireland 1995 – 2009

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TABLE OF CONTENTS

Abstract

Interactivity is integral to media and communications and yet is a contested concept in the literature. There is little agreement on its meaning not least because of its multidisciplinary nature. Previous research, concerned with finding a single definition of interactivity, has focused narrowly on specific contexts of communication using limited methodologies. This thesis argues that several meanings of interactivity are in circulation and that the search for one bounded definition constrains understanding of its role and fails to recognise its analytical potential. The study makes an original contribution to research by presenting findings from an analysis of public discourses on interactivity, a valuable source of material neglected in research to date. It shows that at least nine thematic representations of interactivity are in circulation representing different aspects of its role in communicative events. These are identified as the Empowering, Commercial, Pedagogical, Aesthetic, Ludological, Futuropia, Hula-hoop, Sceptical and Information Society themes.

The results are based on a longitudinal content and discourse analysis of fifteen years of newspaper coverage in Ireland, an original methodological addition to research, reflecting both a unique national perspective on the concept and the flow of influential international discourses within a small state. The content analysis draws a detailed quantitative picture of how and where interactivity arises in news coverage while the discourse analysis examines qualitative aspects of the dominant, overlapping and conflicting discourses around interactivity and the discourse communities operating behind the talk.

The analysis illustrates how thematic representations of interactivity coexist both in discourse and in individual communicative events, suggesting the potential for layered *interactivities* in communication. The 'age of interactivity' describes a wide range of discourses from hype and myths around interactivity to its potentially transformative role in communication. Overall this thesis highlights the value of interactivity as a communication concept and analytical tool with rich research potential.

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Abbreviations:

CMC: Computer Mediated Communication

GUI: Graphical User Interface

HCI: Human Computer Interaction

ICT: Information and Communication Technologies

IDSN: Integrated Services Digital Network

LAN: Local Area Network

LN: LexisNexis

NII: National Information Infrastructure

PwC: PricewaterhouseCoopers (management consultants)

WIMP: Windows Icons Menus Pointer (style of graphical user interface))

CHAPTER 1
Introduction

Interactivity is integral to many everyday media and communications experiences. Television, touch screens, toys, web sites, games and exhibits are described as 'interactive' yet, as a concept, interactivity rouses questions, debate and frustration for audiences and users and within the academic community. According to the many studies on interactivity from a number of disciplinary perspectives, it is a contested concept. The media and communications literature offers many valuable theoretical and technical descriptions of interactivity but research tends to pivot on the search for a single bounded definition. This has resulted in debate over where interactivity resides, critique of the ideologies and technologies associated with it and divided opinion on whether or not it even exists.

This thesis argues that there is not *one* single definition of interactivity but possibly *many* and that the search for a single definitive understanding of the concept has constrained understanding of the role interactivity plays in communication and has limited exploration of its potential as a media and communications research tool. This study aims to show that multiple meanings of interactivity are circulating in public discourses and that these discourses, previously neglected in the research on interactivity, are a valuable source of material for analysis. This thesis also argues that the multiple meanings of interactivity in circulation may even coexist in the discussion or experience of a single communication event. Indeed the treatment of such events as potentially layered interactivities offers opportunities for deeper examination of the communication processes involved.

Strict adherence to disciplinary boundaries has limited the potential for research into this multidisciplinary concept. This thesis presents a multidisciplinary approach to the study of interactivity, using a quantitative and qualitative research design that allows the latitude for theoretical, technical, cultural, political and other perspectives on interactivity that might be addressed. It also provides the longitudinal data currently absent from research into interactivity, which is important for a concept associated with evolving technological development. The study will examine how discourses around interactivity and its meaning have developed and shifted over time and how these trends relate to discourses found in the literature. Overall, the thesis aims to describe the 'age of interactivity', a period of time over which theory evolves, technologies and practices associated with interactivity are developed and public discourses reflect the shifting meanings and practices circulating around the concept. It is also a time where personal and mediated communications are and continue to be characterised by the particular qualities that interactivity represents.

1.1 Thesis structure

This brief overview of the thesis structure describes the various stages in the research process in more detail:

a) The literature on interactivity

The literature review is structured across two chapters and presents as much of the research on interactivity as is feasible for such a multidisciplinary concept. The first chapter reviews the current state of theory on interactivity and the various 'modes' or types of interactivity identified across different disciplines both in its analogue (interaction) and digital (interactivity) forms. The second chapter reviews the common elements of interactive communication – Context, Action, Meaning/Outcome, Strategy/Intention – found across the modes. This chapter then presents an overview of the dominant discourses around interactivity arising from the literature.

The aim of the review is to present a picture of the 'age of interactivity', to show how the concept continuously shifts position and focus, with some modes appearing to coexist at the same time. The aim is also to move away from emphasis on defining the concept towards instead the analysis of the competing discourses and the role discourse plays in understanding interactivity. The review shows that both 'interaction' and 'interactivity' exist concurrently in the literature at various points, suggesting that the concept did not evolve in a linear, systematic or chronologically staged way. Therefore, rather than attempting to trace the 'evolution' of interactivity, the review addresses the evolving theoretical discourses around the concept of interactivity. Methodological approaches across the literature are also examined for both the innovations and constraints, in order to assess where gaps may lie and how this study may make a contribution to the literature on interactivity.

b) The conceptual framework for investigating interactivity

This chapter outlines the purposes of research by exploring in more detail why interactivity is important and what this study aims to add to existing theory. It describes the theoretical approach to the study through the problematisation of interactivity. This describes both the theoretical and practical problems posed by the competing discourses of interactivity in the literature and in practice. It presents the deconstructionist approach taken (Howarth 2000, after Derrida, 1981) in order to transcend the disciplinary and practice boundaries that exist in current research on interactivity.

The framework for carrying out a discourse analysis is then outlined. This describes the particular discourse analysis perspectives that inform this thesis which include the combined discourse analysis approach described by Jorgensen & Phillips (2002), the discourse theory analysis (DTA) of Carpentier & deCleen (2007) and aspects of critical discourse analysis

(CDA) described by Wodak & Meyer (2009) and Fairclough (2009). The concepts of 'discourse communities' (see Swales 1990, Wallace, 2005) and 'boundary object' (Star & Greisemer, 1989) are also introduced as the key analytical tools which will be used to reflect on the discourses around interactivity found in the data.

The thematic approach to the discourse analysis is then outlined, along with a review of the benefits of a comprehensive multidisciplinary research framework. Finally the specific research questions of the thesis are introduced, which ask what meanings of interactivity are found in public discourses, how these relate to the academic literature around interactivity, what the dominant and marginal themes are (and how these interplay) and what discourse communities are observed in the discourses. Two further questions are also addressed which relate to the role of the museum or exhibition space in discourses on interactivity and the role of interactivity as 'boundary object' .

c) The methodology selected for research

The methodology describes the specific quantitative and qualitative approach to research which has been chosen for this study on public discourses of interactivity. First, it reviews the methods used in previous studies in order to show how this study makes an original contribution. Then it outlines the research design consisting of a content analysis and discourse analysis of public discourses on interactivity. The content analysis provides quantitative and longitudinal data and fulfils the validity requirement for the discourse analysis which in turn provides the qualitative analysis of discourses and forms the core findings of the study.

The content analysis examines fifteen years worth of newspaper coverage of interactivity and includes a pilot study conducted at the outset to test the codebook (available in the Appendix), the data sources and sample size. Each of the quantitative and qualitative variables in the coding process is introduced, which include: the genre and topics of articles in the sample as well as locations referred to within, the contextual details of references to interactivity such as the venue, domain of communication and technical configuration, the meanings of interactivity emerging in the coverage through the mode of interactivity identified and the definitions inferred from the text and finally the thematic representations of interactivity arising. The thematic representations form the core material for the discourse analysis. The quantitative findings are used to select individual articles for analysis and the particular elements which inform the detailed text and intertextual analysis are outlined in detail. Finally, this chapter also addresses some limitations of the chosen method and problems encountered during the analysis while indicating where measures have been taken to ensure validity, reliability and representativeness.

d) Quantitative study: Content analysis & findings

The content analysis presents a detailed picture of the coverage of interactivity arising from the sample. The quantitative findings for each of the variables outlined in the Methodology chapter are presented here along with a discussion of the important trends found and some correlations and associations that serve to illustrate particular features of the coverage. This chapter also addresses unexpected findings and those contrasting with expectations, highlighting, where possible, how the data compares with the literature on interactivity. The final section presents the quantitative results for the thematic representations of interactivity, which forms the basis of the more detailed discourse analysis of materials that follows. It describes the features of each of the themes of interactivity, and how they were identified in the coverage along with findings of frequency, trends overall and other observations relative to the discourse analysis.

e) Qualitative study: Discourse analysis & findings

The discourse analysis forms the core of this thesis and is presented across three separate chapters, each addressing three of the nine themes found in the coverage of interactivity. The themes are presented in order of frequency from the most commonly found themes (*Empowerment, Pedagogical, Commercial),* to the mid-frequency themes (*Aesthetic, Ludological, Futuropia)* to the least frequent themes in the sample (*Hula-hoop, Sceptical, Information Society)*. However, regardless of frequency each theme is given equal footing in terms of analysis as each performs an important function in the overall public discourse on interactivity.

Each theme is addressed via a detailed examination of a number of representative articles selected from the sample. The analysis attempts to draw a picture of the thematic representation according to its components, its association with quantitative variables in the coverage, its development over time (if relevant), the overlaps, support and conflicts observed in relation to other themes and the discourse communities arising in the coverage. An intertextual analysis is also carried out where relevant on further materials, documents and discourses cited in the selected articles. Each analysis concludes with a discussion on the theme, the interplay observed with other themes and the impact of wider discourses that emerged from the literature and the intertextual analysis. It also addresses how the thematic representation of interactivity impacts on the meaning of interactivity and its application in particular contexts that are observed in the analysis. The discussions finally identify instances in the analysis where the examination of interactivity can be used to explore aspects of the communication process in more detail. This represents the 'boundary object' potential of interactivity as an analytical tool in media and communications research.

The thesis concludes with a discussion of the findings in relation to a) the relationship between thematic representations of interactivity and the elements of interactive communication identified in the literature review, b) the discourse communities operating behind the talk, both those dominating thematic representations and discourses on interactivity overall, as well as those missing from the coverage and c) the interplay of discourses arising both from the analysis and from the literature review. The discussion concludes with observations on the overall research process, opportunities for future research, a reappraisal of the research questions and a restatement of the contribution this thesis makes to interactivity research

1.2 Concluding introductory remarks

Public discourse on interactivity exists. We talk about it because of the permeation of the concept into the fabric of personal and mediated communication. Yet previous research on the concept of interactivity has neglected to include public discourse materials, which this thesis argues may provide important insights into the understanding of interactivity in theory and in practice.

Interactivity has been described as a distinct characteristic of new media (DeFleur & Ball Rokeach 1989, Lanham 1993, JF Jensen 1998, McQuail 2004, Bassett 2009), one of the key terms in the new media discourse (Pavlik 1998, KB Jensen 2002) and "one of the most sought-after goals of the new media age" (Pavlik 1998). However, interactivity has also become "a broad term which carries a cluster of associated meanings" (Lister 2003:19). It is considered "too broad to be truly useful" and in fact a tautology when applied to Human Computer Interaction (HCI), rendering it a "myth" (Manovich, 2001:p.55). Some go so far as to say that to call something interactive is to "endorse it with a magic power" (Aarseth, 1997). This makes interactivity "problematic and ideologically charged" (Newman 2002), one of the "unsettled issues" in new media and "notoriously difficult to define" (KB Jensen, 2005, see also Shultz 2000, Huhtamo 2000, Kiousis 2002, McMillan 2002, Reinhard 2011).

These contributions illustrate the state of the art in interactivity research, why the thorny issue of definition is problematic and why this thesis aims to take a different approach. Rather than seeking one definitive understanding of interactivity, the core interests of this study are to examine first, why interactivity is understood in such a variety of different and contested ways, and second, how these competing discourses around the concept relate to public discourses on interactivity. It begins with a comprehensive review of the literature on the concept, the first step in the description of the age of interactivity.

CHAPTER 2
The literature on interactivity

The evolution of discourses around interactivity in the literature occurs against the background of at least a century of technological development and research in media and communications. Various technological and theoretical milestones have been highlighted in the literature in association with it, such as the invention of the mainframe computer in the 1940s (McQuail, 1986), the emergence of cybernetic theory around the same time and its emphasis on feedback (Kiousis, 2002) and the development of Human Computer Interaction (HCI) theory (see Manovich, 2001). In the 1950s and 1960s, interactivity was associated with the increasing sophistication of computing, in connection with 'automation' and 'cybernation' (Huhtamo 1999). While by the 1980s the computer had achieved the status of medium (Winograd & Flores, 1986), and by the 1990s it had become a mass medium, indeed a 'new category of medium' (KB Jensen 2005). From then on, interactivity was widely regarded as "*the* defining characteristic of computer media" (ibid:184, his emphasis).

Throughout, interactivity has been addressed from a variety of perspectives in the physical and social sciences as well as from humanities, commercial and educational perspectives. Various styles or 'modes' of interactivity are observed across the range of perspectives – for example in face-to-face social interaction, browsing the web, email and so on. These modes emerge either as a specific communication context being examined or as referenced in critical and theoretical discussions. But before exploring the modes, the review begins by addressing the current state of theory on interactivity.

2.1 Theories of interactivity

The literature has many 'scattered and incoherent' theories on interactivity (Kiousis 2002). There are some common basic assumptions such as its association with new information and communication technologies, as an inherent characteristic of new media (DeFleur & Ball Rokeach 1989, McQuail 2000, Kayany et al 1996), and its dependence on the technologies in use (Schneiderman 1987, Durlak 1987, Steuer 1992, Lanham 1993, Bucy 2004). But these are very broad and the standard for distinguishing an interactive medium from one that is not, is somewhat ambiguous (Kiousis, 2002). Many 'definitions' presented in the literature attempt to associate interactivity with features of the technology, the messages or the participants, for example:

- *Technologies*: Interactivity is associated with new communication technologies (DeFleur & Ball Rokeach 1989), it is technologically determined (Steuer 1992), it is associated with the internet and worldwide web (Lanham 1993), it is an independent

variable to describe a medium (Kayany et al 1996) and is an attribute of technology and not of the user (Sundar, 2004).

- *Messages:* Interactivity is about the interdependence of messages (Bretz 1983), the interconnectedness of messages and the extent to which they relate to earlier messages (Rafaeli 1988) and is not a characteristic of medium but a process related construct (Rafaeli and Sudweeks 1997).

- *Participants:* Interactivity relates to the extent to which users have control over or can participate in modifying the form and content of a mediated environment in real-time (Williams et al 1988, Steuer 1992), or a measure of a medium's ability to let the user exert an influence on the content and/or form of the mediated communication (JF Jensen 1998, Ha and James 1998).

- *Perceptions:* Interactivity operates at different levels depending on user's perceptions (Newhagen et al 1995) or it is a function of the medium in parallel with the perception of participants (McMillan 2000).

- *Varieties:* There are distinctions between content and interpersonal interactivity (Massey and Levy 1999), between human interaction and interactivity with technology (Stromer-Galley 2000, 2004) and between interactivity as a property and an activity (Richards, 2006) and so on.

While useful, these definitions do not necessarily aid clarity over what is evidently a multi-faceted concept. Further conceptual strategies have attempted to grapple with the nature of interactivity by presenting a spectrum of operation, in order to move from theory building towards a more broad or 'ultimate' definition (JF Jensen 1998). This has resulted in several multi-dimensional typologies, for example: Heeter's (1989) six dimensions of interactivity, JF Jensen's (1998) 'Cube' of interactivity, McMillan's (2000) 4-part model, Downes and McMillan's (2002) multidimensional construct and Koolstra & Bos' (2009) 8-element objective measurement instrument. Further research attempts to show that interactivity exists on a continuum of 'low' to 'high', echoing Goffman's (1985) spectrum of action in social interaction, depending on the communication 'style' underway (for example Laurel 1986, Rafaeli 1988, JF Jensen 1998, Kiousis 2002, McMillan 2002, Liu & Shrum 2002).
But Bucy (2004) bemoans this 'fixation with taxonomy' as a self-defeating tendency in interactivity research. Instead, he presents his own multidimensional construct, based on where interactivity 'resides', which he concludes is *within users*. He also calls for a delimited use of the concept restricted to mediated interactions only, in order to "discourage its haphazard use", as though such a normative approach could influence discourse or further research (ibid:p.375). His critique of the taxonomy fixation and 'reinventing the wheel' that takes place in research may be somewhat justified, as is his observation that too much

discussion has taken place on 'what' exists rather than 'why things happen'. However, his own conclusions reflect yet another self-defeating tendency in the literature – the overriding concern with where interactivity 'resides', as though it is a fixed characteristic, rather than the role it plays, which is perhaps more fluid. Clarity over its role in communication would help in the understanding of how and why it is implemented.

a) Rival camps – 'unsettled issues' of characteristic, context and perception
Investigations into interactivity tend to define it as either: a) a characteristic of the medium, b) dependent on the context in which messages are exchanged, or c) "a perception in users' minds" (see Kiousis 2002:356 citing Heeter 1989 and McMillan 2000, see also Reinhard 2011). Indeed the question over which of these defines interactivity or whether it is a combination of all three, takes up much energy in the debate between 'rival camps' in the literature (see Hales 2002, Kiousis 2002, Quiring 2009). This debate mirrors three distinct concerns observed in new media discourses in general, whether new media refer to a) new technologies or techniques to mediate communication, or b) new materials which are mediated, or c) new relationships between senders/receivers or producers/users of mediated materials. Indeed again, it may be a combination of all three (see Pavlik 1998, McQuail 2000, Manovich 2001).

In much of the literature, the emphasis placed on different aspects of interactivity is largely, though not exclusively, determined by the particular technology being researched. For example, research on interactivity in websites tends to discuss user perceptions of interactivity and potential benefits for users (see Downes McMillan 2002, Stromer-Galley 2004). Computer mediated communication (CMC) research tends to emphasise characteristics of the technology and context through analysing messages or feedback (see Rafaeli and Sudweeks 1997, Shultz2000). Information and educational design studies focus both on context and characteristics of technologies, in the process or 'art' of designing interactivity (see Sims, 1997). While on the other hand hypertext and games studies focus on the *perception* of users through the sense of immersion or 'flow' produced (see Ryan, 1994). Definitions that rely on the characteristics of a technology are problematic because they quickly go out of date (JF Jensen, 1998). But it is arguable that definitions based on user perception are also limiting because they tend to emerge from a set research context, whether participant observation or a specific questionnaire design, which may itself contain a number of preconceptions (for example Downes and McMillan, 2000, KB Jensen et al 2005). Many such studies have also been designed specifically for the purposes of comparison to (and to differentiate from) social or 'human' interaction (Lunenfeld 1993), which assumes a normative standard.

Meanwhile, definitions that focus on the context in question, such as games, art or education, are frequently informed by a set of predetermined outcomes assuming beneficial links between interactivity and play, art or learning. These assumptions, as seen in science museum research for example, reflect positivist assumptions that science benefits society and are frequently ideologically and politically problematic (see Barry, 1998). Similar assumptions about its empowering and disruptive potential are also at the basis of both anarchic and civic engagement perspectives on interactivity (for example Dinkla 1994, Manovich 2001, Stromer-Galley 2004) but which emerge from theoretical critique rather than quantitative and qualitative studies. Sundar (2004) suggests that it is the disciplinary focus of research, whether information science or cultural studies that influences which definitions come to the fore in interactivity research. The multidisciplinary interest in and nature of interactivity are both a source of clarification, over- classification and confusion.

b) Hype and hybrid theories

From an evolutionary perspective, we can see that early definitions of interactivity focused on the characteristics of the technology. This most likely emerged from what Huhtamo (1999) calls the 'engineer approach' in archaeology, focusing first on practical developments in technologies, rather than their uses or effects. Later studies switched emphasis to the context in question, reflecting the rapid proliferation of 'new media' with interactive potential (Sundar 2004) combined with a research emphasis focusing more on both the 'cultural and computing' (Manovich 2003). This was accompanied by a notable parallel increase in academic interest and publications on interactivity (see Koolstra & Bos, 2009).

A number of theorists such as Lister et al (2003) argue that, by their digital nature, new media offer users opportunities to manipulate content and intervene in its meaning, thus creating their 'interactive' potential. But sceptical views also focus on the 'hype' surrounding the concept, questioning what makes a communication interactive other than being labelled as such (see Aarseth, 1997, JF Jensen 1998, Shultz 2000, Sundar 2004). By the mid-1990s, interactivity was deemed 'fashionable', giving rise to new concepts such as 'interactive shopping', 'interactive television' and 'interactive entertainment', catchwords seldom used up to that point (Huhtamo 1999). By the turn of the millennium, everything from "snoring dolls and web-based brochures to video games and online transactions" were considered interactive (Downes and McMillan 2000:157) diluting the value of the concept further.

The debate over what makes 'interactive television' interactive (see Kim & Sawhney 2002, Holmes 2004) reflects the 'ideology' of interactivity – a perceived new media characteristic deployed as a 'buzzword' to sell the capacities of multimedia (see also Shultz 2000, Lister et al 2003). Winston (1998) suggested the failure of the CD-Rom to live up to the promise of its 'interactivity' had a particularly negative impact on the concept.

From 2000 onwards, there has been a call for a turn to the user in interactivity research (see Downes & McMillan 2000, Jenkins 2003, Quiring 2009, Koolstra & Bos 2009). This accounts for the more recent emphasis on perception in the literature but it has also brought theory from psychology and semiotics back into play (for example, Newhagen, 2004). It has also seen the acknowledgment for the first time that users may have preconceptions about interactivity, before entering into and commenting on interactive communication for research purposes (Quiring, 2009). This issue is directly relevant to this study, which aims to show that a variety of influential public discourses about interactivity are in circulation and may impact on its implementation in communication and on its understanding in operation.

A number of hybrid theories have emerged which seek to combine the different definitions of interactivity. Some attempt to distil research to date into a super-theory or 'explication', locating interactivity in all three aspects of characteristic, context and perception with differing emphasis (see Kiousis 2002, Liu & Shrum 2002). Others attempt to merge common aspects of prior research into an instrument for measurement of interactivity (Koolstra & Bos 2009). Further studies suggest that because interactivity refers to several distinct phenomena it can be observed in single communication events as 'interactiv<u>ies</u>' (see KB Jensen 2002, Reinhard 2011). This notion of plural interactivities is echoed in Richards (2006) notion of the 'generative' capacity of interactivity, where the interactive 'activity' allows users to create further content beyond the interactive event. This view is also relevant to this study, which aims to show how several perspectives on interactivity can be seen to coexist in the same communication event.

Interactivity research has reached a plateau of sorts. It is still a contested concept with disagreement over where it resides, which is its most important aspect, what effects it has on users, media and society and how it might be defined. However, lack of past and present agreement does not preclude future coherence. It suggests that while much progress has been made, there are still gaps in the theoretical and methodological approaches to date and opportunities for alternative analytical strategies. This study aims to address one of those gaps, by analysing the public discourses on interactivity so far missing from the literature. This review will first explore the possible origins of some of these discourses with a brief overview of the various 'modes' of interaction and interactivity identified in the literature. It begins with the 'analogue' modes of interaction associated mainly with the fields of sociology, psychology and communications studies, followed by the 'digital' modes of interactivity.

2.2 Modes of interaction - analogue

This presentation of analogue modes does not aim to locate a definitive version of interactivity, but rather to illustrate the complexity of the concept from its origins, which may

help to explain its 'problematic' nature. It also introduces elements relevant for the discourse analysis.

a) Social interaction – sociological and psychological perspectives

The *International Encyclopaedia of Communications* defines interaction as occurring "as soon as the actions of two or more individuals are observed to be mutually independent", when participants are in a "state of reciprocal awareness" or where each "is aware of the presence of the other and each has reason to believe the other is similarly aware" (Duncan, 1989:325). It is also described as "the exchange and negotiation of meaning between two or more participants located within social contexts" (O'Sullivan et al, 1994:128). Therefore, the basic elements required for social interaction are participants, a transfer of meaning, an element of exchange, negotiation and reciprocation, and a 'context' of mutual awareness. Context is of particular relevance to 'social interaction', described as "the process by which we act and react to those around us" consisting of verbal and non-verbal communications such as gesture and expressions or 'cues' (Giddens 1997:73). The analysis of social interaction considers not only the social context in question but all other elements brought to it such as roles participants play and so on. These are considered as important as non-verbal communications in shaping social interaction (see O'Sullivan et al, 1994, Jensen 1998). Social interaction analysis has been strongly influenced by Goffman's (1963) dramaturgical model, where participants behave as 'actors' upon a stage, utilising a 'back stage' or private area to prepare, while interaction takes place on the 'front stage' or public area. Behaviour in interaction is contingent upon practice, props and cues and so on, which reinforce the dramaturgical metaphor. Drawing on Goffman, Giddens (1997) outlines two distinct styles of social interaction – 'unfocused' and 'focused' interaction. Unfocused interaction is the mutual awareness of the presence of other people (usually in numbers such as on the street or at a party). Focused interaction on the other hand involves direct attention and is also described as 'face-to-face' interaction. This takes the form of an actual 'encounter', which can occur against a background of unfocused interaction. In order to distinguish a focused interaction from the unfocused background, we use 'openings' (such as eye contact, shortening of distance, greetings etc.) to indicate that what Goffman (1963) calls 'civil inattention' has ended[1]. These openings are a crucial point in the initiation of interaction (Giddens 1997:75). Meanwhile social psychologists have long debated the question of whether it is elements of personality or situation that affects behaviour and a 'trait vs. situation controversy' has heavily influenced views on interaction (Buss, 1981). Buss outlines two distinct uses of the term – *statistical* and *dynamic* interaction. Statistical interaction is where 'trait' and

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[1] 'Civil inattention' allows passers by to look away or ignore each other. Goffman sees it as a characteristic of urban societies allowing large numbers of strangers to co-exist.

'situation' variables are combined. Analysing interaction from this viewpoint explores the different variables at play in different situations, but not much about the nature of interaction itself (1981:228). Dynamic interaction on the other hand combines the 'cognitive' and 'social learning' positions where trait and situation are mutually influential and the focus is on the interaction. This is closer to the social interaction described in sociology, emphasising the 'reciprocal' processes occurring in interaction and again, laying stress on context (1981:229).

b) Symbolic Interaction – literary theory influences

Some communications such as reading a book or going to the theatre are not regarded as social because there is no 'observable reciprocation from others' (i.e. the participants are not two people). O'Sullivan et al (1997) describe these situations as symbolic interaction, "an approach to social relations emphasising the importance of 'negotiated meanings' associated with symbols exchanged in interaction between self and other" (ibid:p.xx). Symbolic interaction can apply to all aspects of micro- and macro-sociology but is "most relevant in relation to concepts of meaning" (see Plummer, 1996:241).

Symbolic interaction is closely associated Blumer and the Chicago school, but also with Wolfgang Iser and the analysis of interaction between reader and text (see Iser 1980, Fiske 1990, O'Sullivan et al.1994). Interaction between reader and text 'actualises' the work of the author. This occurs when readers mentally fill in gaps in order to construct meaning during the reading process (Iser, 1980). This view is associated with the 'reader response' theory of literary criticism, which attempts to show that the reader, viewer or spectator is always active in creating meaning along with the author.

Goffman (1963) includes such alternative modes of communication in his spectrum of interaction, echoed in later studies on interactivity in digital media. He places 'talking to oneself' at one end and 'mediated social interaction' at the other (see Burns, 1992). Talking to oneself corresponds to the central requirement of symbolic interaction, which consists of two distinct steps in the 'use' of meaning: the first requires interacting with oneself – the participant or 'actor' points out a symbol and initiates an internalised social process; the second part of the process is interpretation of that meaning (Blumer, 1969:5, see also Newhagen 2004).

Symbolic interaction therefore differs from social interaction on two levels – it has a primary emphasis on the *meaning* exchanged during the interaction, as opposed to social interaction, which has its emphasis on elements of the *context*. And it opens up the possibility for interaction with oneself as well as interaction between a person and a text.

c) Mediated Interaction

Much early research on mediated communications concerned traditional analogue media (telephone, television and radio) and focused on comparing technological interactivity, often negatively, with the ideal of social or 'face-to-face' interaction (for example DeFleur & Ball-Rokeach 1989, Morse 1998) This normative approach has been criticised for failing to observe crucial differences between social and mediated interaction (Downes and McMillan, 2000, Kiousis 2002). Adopting a normative standard can be a useful exercise in comparing one mode of interaction with another. But it may also lead to new modes being judged by inappropriate standards, which fail to acknowledge the inherent differences between modes. In practice, standards and methodologies designed for social interaction studies have been influential on subsequent research in other modes. The focus on "small group analysis of face-to-face interactions" in social psychology for example may be responsible for introducing these standards to mediated 'interaction' scenarios (see Baym 2002:68).

In his typology of interaction, Thompson (1995) describes face-to-face interaction as that mode where participants share a 'context of co-presence' and simultaneity of space and time which allows for 'deictic expressions' such as 'here', 'now' to be used (1995:82). Mediated interaction on the other hand is a mode which involves the use of a technical medium allowing participants to send messages remotely in terms of distance, location and time, requiring contextual rather than deictic information (address, date etc.). This type of communication requires more interpretation than face-to-face interaction and is more 'open ended' in nature. It involves two 'front regions' (after Goffman) separated by space and/or time, each with its own 'back regions' and the participants in the interaction manage the boundaries.

Thompson also introduced a third mode of interaction – 'mediated quasi-interaction' – where the range of participants includes indefinite recipients (such as via television, newspapers, books and so on). In this mode, communication is one-way or monological, so the degree of reciprocity is reduced. It takes place in fragmented contexts of two separate interactions: the 'interactive framework of production' and the 'interactive framework of reception', each context with its own 'back' and 'front' regions (1995:82). This recalls Horton and Wohl's 'Para-Social Interaction' (1956), which gives "the illusion of a face-to-face relationship with the performer" and was considered characteristic of the 'new mass media' of radio, television and cinema (ibid: 215). But it is also reflected in the more recent suggestions (noted earlier) that plural 'interactivities' may take place in mediated communications (KB Jensen 2003). New mediated interactions were seen as 'extended in space and time', having 'different characteristics' which 'enable action at a distance' (Thompson, 1995:82). The new electronic media appeared to break the link traditionally made between a social setting and the physical situation, leading to potential for overlapping modes of interaction. But Meyrowitz (1985)

suggested that the collapse of space/time boundaries meant that mediated communications could in fact resemble face-to-face interaction even more.

Mediated interaction has introduced new contexts for social interaction that raise questions of *how* interaction takes place, rather than where or when. Because the non-verbal or symbolic cues are likely to be different in mediated interaction, depending on the context, the focus moves to the *strategy* and the *action* that takes place.

So far this review has highlighted some requirements common to all modes of analogue interaction: a) the existence of participants, b) an element of exchange, c) a sense of awareness and d) a level of action. Without these there would be nothing to observe and for that reason at least these requirements tend to elicit general agreement. The elements of interaction observed in the literature therefore are *context*, *meaning, strategy* and *action*. Further clustered meanings circulating around the concept of interactivity are outlined next in 'digital' modes' of interactivity. Again this is not aimed at establishing a definition of interactivity. Instead the discussion aims to illustrate further complexity in analytical strategies and identify the requirements and elements most relevant to the discourse analysis.

2.3 Modes of interactivity - Digital

The proliferation of technologies considered interactive has generated a level of both hype and scepticism over the concept, as noted. Therefore, rather than using specific named instances, the modes of interactivity are identified according to the 'sphere' of the interaction, or by asking simply 'with what' a participant primarily interacts. This correlates to the 'instrumental' or functional view of interactivity, which avoids ideological distinctions (see Lister et al 2003), while allowing for the multidimensional or spectrum views of interactivity outlined earlier where two or more modes can be observed. The modal structure allows exploration of many disciplinary fields of influence and shows where and how the "characteristic vs. context vs. perception" debate arises. It also explores some dichotomies or binary views of interactivity that emerge. The modes are: Interactivity with a Machine, Interactivity with Other People, Interactivity with Data and Interactivity with a System. Some kinds of digital interactivity may involve several or all of the modes – machine, others, data and systems – suggesting multiple layered interactive events.

2.3.1 Digital Mode 1: Interactivity with Machine

The mode of interactivity with a machine has been at the core of Human Computer Interaction (HCI) studies for decades, but is also influenced by Artificial Intelligence (AI) and other computer science fields, which view interactivity as a technical property of computing

or a *characteristic of the medium*. However, there are also competing influences from graphic design and psychology, which lean toward the *perception* and *context* perspectives.

a) Operating machines – HCI theory

HCI theory is concerned with the wide variety of scenarios where people use computers whether at home, at work or at war. Originally a 'user-centred' field of research, HCI aims at improving interaction between people and analogue machines. It addresses the physical relationship between people and computers, originating when the latter occupied entire rooms with multiple tools and levers requiring manipulation when 'batch' processing data. The development of the 'interactive' mode in computing allowed operators to intervene and view processes while running, thus changing the nature of this relationship between human and machine (Suchman 1987, Jensen 1999). Computers have since shifted from analogue to electronic to digital and their uses have evolved from speedy calculator to complex data processing tool to communication tool, publishing medium and beyond (Winograd and Flores, 2003).

Most digital interactivity could be said to involve HCI at some level, because some form of 'computer' is usually required for digital communication. But despite the fact that people now watch television and browse the internet on phones, HCI theory has been slow to move away from the dominant paradigm of interaction via computer screen, keyboard and mouse. This 'third age' of user interfaces, after punch cards and command lines, is represented by "WIMP GUIs" or graphical user Interfaces that use windows, icons, menus and pointing devices (van Dam, 1997). Thus, HCI as the study of human-machine operations is a 'powerful cultural tradition', which has created a particular way of "representing human memory and human experience" (Manovich, 2001). This is seen in the many visual metaphors HCI has firmly established in communications such as folders and windows or the familiar actions now embedded in our culture such as 'copy/paste' and 'delete' (ibid: 69).

The history of HCI tends to reflect the development of technology, but also of different skill sets in computing and increasing levels of abstraction between user and machine (see Dourish, 2001). An alternative history of HCI sees a gradual shift in styles of interaction, from electrical interaction (circuits, memory) to symbolic interaction (programming and code), to textual interaction (commands, applications and a grammar of computing) to graphical interaction (the GUI and dominant metaphor of windows). Indeed Dourish (2001) goes a step further and predicts a future for HCI in tangible and social computing and ultimately, *embodied* interaction.

b) Artificial Intelligence – computer science perspectives

Artificial intelligence could be viewed as part of an attempt in computer science to replicate face-to-face human social interaction, through robotics for example. However, AI also suggests a temptation to anthropomorphise 'intelligent agents' and "to think of them as *electronic humans"* (see Hewitt & Inman 1991:p1417). The mistake in this approach is that it considers agents and humans to be equal partners in interaction (ibid).

Suchman (1987) observes how early attempts in AI to create interactive devices were 'fundamentally misguided' because of a misunderstanding of social interaction. AI was designed around a perceived 'planned approach' rooted in Western culture (and therefore in formal sciences) as the 'correct model' for rational thinking (1987:p599). Its inherent logic is that before any action, a strategic approach is taken to that action, planning it from start to finish rather like an explorer mapping a route before setting out. While attractive for a computational model of action it does not reflect human reality, where human actions are contingent on contextual conditions – technical issues, random incidents, weather, contrariness etc. This stems from the fundamental view in computer science that the *physical* (things designed, built, used) and *social* (things with which one communicates) are separate, a distinction that becomes problematic with 'interaction' (ibid: p600).

The evolution of technology has seen a parallel shift in computers from machine to social object (see Turkle, 1984, Suchman, 1987). This may be partially responsible for the drive not just to compare mediated interactivity to social interaction but in AI attempts to emulate it. Turkle (1984) sees positive social benefits in the peculiar concept of 'self' that computers offer, allowing for safe kinds of interaction perhaps not always available in social interaction: "You can interact but need never feel vulnerable to another person" (ibid:p.307). There may even be "a new kind of intimacy" in interactivity with machines, as experienced in game play (ibid:p.500). Turkle's observations allude to emotional and sensory aspects of HCI, which concern the *perception* of agency and interaction presented by a machine through its interface, rather than just the inherent *characteristics* of the machine. Indeed studies examining how people perceive interaction with computers, suggest that they see the machine not just as a medium but also as a 'source' or participant in communication (Sundar & Nass, 2000).

c) The GUI – graphic design theory

The development of the graphical user interface (GUI) produced a major shift in interactivity with machines. It opened the door to the influence of graphic design theory and how it could 'improve' HCI through the use of two- and three- dimensional visual representation and general 'affordance' of graphic design (Norman, 1998). The 'direct manipulation' of data using buttons, immediate action display and the cursor was a key development (see

Schneiderman, 1983) and graphic design in HCI is now highly influential in digital media practice (see Silver, 2000, Schneiderman & Plaisant, 2005). A further new subfield, 'Information architecture' emerged in the 1990s to focus both on the presentation of information on screen and the structures within which users navigate data. A relatively small issue such as labelling of content or design of navigation options (links, buttons etc.) was now seen to have a major impact on the quality of the HCI experience (see Rosenfeld & Morville, 2006). Advances in HCI and GUI design mean that interaction with machines is now far less physical than it was previously, but is arguably more cognitively strenuous as interface complexity and the potential for multitasking increase (see Nelson 1990, Sundar 2000). But again, these aesthetic elements of HCI invite questions around whether interactivity resides in the *perception* of user experiences or is a *characteristic* of the technology. Clearly, interface design occupies the space between the two, being both a characteristic of computers while also utilising design techniques to deliberately impact on perception. This shows that arguments for defining interactivity in an either/or sense break down when applied to the process of communication in even the most conservative of HCI experiences.

d) Ubiquitous machines

Recent approaches in computer science attempt to switch the focus from procedures and agency to interaction itself. These are more concerned with the 'interplay' between many small computational devices than with the single "procedural monolithic engine" (i.e. the computer) (Dourish 2001:p4). This 'ubiquitous computing' describes the third phase of computing architecture, following on from development of the mainframe and the personal computer. It refers to an infrastructure where the desktop interface disappears, and computers move into the background and "weave themselves into the fabric of everyday life until they are indistinguishable from it" (see Weiser, 1991, Weiser et al 1999). Ubiquitous computing is an unusual turn in computer science, in that it did not so much address technical problems and the history of development to date, as create a *specific vision* for the future of computing and build towards it (see Bell and Dourish, 2007). This vision includes a radically different conception of the 'machine' with research pursuing ways to turn domestic appliances and clothing into intelligent agents. This in turn suggests alternative styles of interactivity with the 'machine' adding a new level of complexity to the mode. But rather than subverting the traditional HCI view of interactivity as a characteristic of the technology, it perhaps reinforces it, as each new instance of machine/object has its own characteristics to bring to the equation. A communication context may in fact involve a range of machines, connected wirelessly, each of whose characteristics may also invite different levels of perception. The ubiquitous computing paradigm introduces layered interactivities and this requires that the concept be clarified in all its dimensions.

e) Feedback & control – cybernetic theory

Long before ubiquitous computing promised multiple intelligent machines in the real world, there was 'cyber-space', the virtual world created by the ultimate interaction between the human and the machine (see Gibson, 1984, cited in Manovich 2001). Gibson's coining of the term 'cyberspace' and its 'interactive potential' is seen as a significant stage in development of the concept of interactivity (McMillan 2002). It prompted some of the earlier investigations into interactivity in the mass media context of CMC (see Rafaeli 1988, Rafaeli and Sudweeks 1997, Downes and McMillan, 2000) and a surge of interest into 'cyber' related cultural research in the 1990s (see Stratton, 1997).

The term derives from cybernetics, the study of "the science of control and communication in the animal and machine" (Weiner, 1947) or "feedback systems of communication and control" (see Fiske 1990, O'Sullivan et al 1994, Morse 1998, Manovich 2001). Feedback and control are the key features of cybernetics, relating to how the flow of information directly impacts on action.

In communication studies, the quality of feedback depends on the channel: some channels allow for more feedback than others. Fiske (1990) suggests that the more channels giving feedback, the better the *quality* of the communication from the point of view of the receiver: face-to-face communication potentially uses all five senses to simultaneously transmit and receive, while mediated communications have limited channels and therefore limit feedback (ibid:p.22). Feedback is not necessarily there to satisfy the receiver even if this is a side effect and the benefit goes to the 'editorial' element in communication. Feedback inserts a 'return loop' but does not destroy the linearity of the message from destination to source (see Fiske 1990).

However, feedback may also relate to the relative 'temperature' of a medium, 'cool' media involving more of the senses being "high in participation or completion by the audience" (see McLuhan, 1964:23). It can be elaborated into a "programmed responsiveness" making the machine appear more social (see Turkle, 1984). But, such "machine feedback that simulates presence", is a process that for Morse (1998) merely mimics face-to-face communication, again raising the normative standard of social interaction for mediated interaction.

These theories, while useful, focus only on the feedback potential of the medium in communications between human and machine. As a 'medium theory' this places too much focus on the characteristics of media and ignores how and why feedback is given (see Meyrowitz, 1985). Feedback in face-to-face communication concerns both participants, with both having similar feedback capacities. Feedback in HCI should be addressed in both participants, human and machine, where the effects of imbalance in capacity may be relevant. Meanwhile, the control element of interactivity is identified in some research along the lines outlined by Bordewijk and van Kaam (1986) in their four-part model of information traffic

(see Jensen 1998, McQuail, 2000, McMillan 2002). The model is based on two axes - control of information (including storage) and control of time and choice of subject. Depending on the level of control of each for both participants, this creates four types of information traffic: Allocution, Conversation, Consultation and Registration[2]. Interaction is most closely aligned with *conversation* where control on both levels rests with participating individuals who are '*equal* in the exchange' (McQuail, 2000:130). Jensen (1998) subdivides 'interactivity' along the same axes, while McMillan (2002) adapts the model in order to explore control and direction of communication as dimensions in *perception* of interactivity (ibid:276).

For now, feedback can be understood as allowing for two-way communication, which is more than mere reaction. The *quality* and *level* of feedback is related to the mode of interaction and to an extent – if interaction is mediated – what the medium will allow. Feedback also implies a system of *control* in interaction, which can be analysed using cybernetic theory, and may help distinguish where interaction begins and ends. It is both a characteristic of technology that facilitates it but is also perceived as a valuable communication construct in digital media.

f) Feedback & ethics

Feedback and control are features of telematics, the science of remote control access through interaction, such as with radar, telegraph, fax and so on. However, telematics is accused of promoting "disengagement or remoteness from the actual effect of one's actions", implying that some mediated interactions raise ethical questions (see Morse, 1998:22). Ethical issues with telematics and robotics have been a concern in mediated interaction since the early 20th century, particularly in military communications and operations (see Capurro & Nagenborg, 2009). In a speech given at the Nuremberg Trials, Albert Speer, the former Nazi armaments minister suggested that telematics may have amplified the authoritative effect of orders:

> "The telephone, the teleprinter and the wireless made it possible for orders from the highest levels to be given directly to the lowest levels, where, on account of the absolute authority behind them, they were carried out uncritically." (cited in McLuhan 1964:247)

This implicates the remoteness of mediated communication technologies (facilitated by feedback) in following orders to commit war crimes. More recently, the increased use of drones in warfare has raised a number of issues around the concept of 'just war', whether remoteness is an excuse for potentially illegal actions by "cubicle warriors" and whether these remote operators are legitimate targets themselves (see for example Royakkers & van Est,

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[2] *Allocution* is defined as an address or speech by one to many – originally used in the latin form *allocutio* to describe the speech or 'harangue' by a Roman general to his army. McMillan (2002) suggests it refers to information flow from centre to periphery. *Consultation* refers to where a person looks for information from the centre e.g. a web search. *Registration* is the opposite where a person gives information to the centre e.g. government records. *Conversation* is interaction without central controls.

2010)[3]. The UK Ministry of Defence recently addressed the question of ethics in the use of unmanned systems, declaring that war "must link the killing of enemies with an element of self-sacrifice, or at least risk to oneself"[4].

Such ethical issues raise questions for interactivity research. Does issuing and following orders constitute interaction? Does distance affect the level of control? Does remoteness affect the user's perception of the effects of their actions? These relate to the elements of intent and strategy dealt with later in this review.

g) Human-Machine fusion – Cyber theory

The more sophisticated or 'seamless' the feedback and control measures are, the more cyber-interaction blurs the boundary between human and machine (Featherstone & Burrows, 1995). Participants control social or face-to-face interaction via their complex behavioural patterns. But in mediated interaction, control is exercised with traditional interpersonal methods (if engaged in CMC), but also with the tools of technology. This challenges the notions of 'actor and 'agent' in communication (see Slack & McGregor Wise, 2002). It also shifts the boundaries of our 'front' and 'back' regions, introducing new 'middle' regions (Meyrowitz 1985). Morse (1998) see this as more than just a shift in perceptual boundaries, but an integration or a physical connection; "a kind of 'suture' between ourselves and machines" (ibid:p.16). The connection constitutes a 'recrafting' of our bodies into a 'hybrid of machine and organism', which goes beyond mere cybernetic analysis and turns us into 'cyborgs' (Haraway, 1991). If the human-machine boundary has indeed been breached, then cyber-theory can move beyond its original focus on how humans interact with machines and instead concentrate on interaction with those categories of object – data, other people and systems – which we access *through* machines.

2.3.2 Digital Mode 2: Interactivity with Other People

This second mode of interactivity represents a digital version of social interaction but a version with far wider applications. It includes perspectives from Computer Mediated Communications (CMC) studies as well as sociology, psychology and media and communications studies and the issue of the normative standard of face-to-face interaction is a dominant theme across all. Obviously this mode assumes the mode of interactivity with machine, in order to facilitate digital interactivity with other people. However, this overview

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[3] For a layperson overview of how drones operate, see "Inside the drone war" by David Muir, ABC news, January 12, 2010 available at http://abcnews.go.com/WN/inside-predator-drones-game-changing-technology-war-afghanistan/story?id=9543587
[4] Joint Doctrine Note 2/11- *The UK Approach to Unmanned Aircraft Systems,* available at http://www.mod.uk/DefenceInternet/MicroSite/DCDC/OurPublications/JDNP/Jdn211TheUkApproachToUnmannedAircraftSystems.htm. See also "The Terminators..." by Richard Norton-Taylor and Rob Evans in *The Guardian,* April 17, 2011, available at http://www.guardian.co.uk/world/2011/apr/17/terminators-drone-strikes-mod-ethics

focuses exclusively on discourses which are relevant to interactivity with other people. The potential layering of interactivities will be addressed later in the review.

a) Anytime, any place - CMC perspectives

CMC describes communication between people via the 'instrumentality of computers' (Avgerinakou, 2003). Communication can be one-to-one (email), one-to-many (e.g. mailing lists) or many-to-many (chat rooms and social networking) and can be asynchronous (email) or real time (instant messaging). The growth of large computer networks in the 1970s across military, government and information technology organisations and the creation of dial up bulletin boards over local area networks (LANs) allowing multiple user 'interaction' triggered this new field of communication research. Many early studies were heavily influenced by social psychology methodologies using small group analysis techniques (Baym, 2002). As noted already, the focus or 'bias' was on how effective and efficient CMC was compared to face-to-face communication.

Views on interactivity from this field focus on the 'context' of communication, a new form of mediated social interaction through computers (Thompson, 1995). As stated in one influential definition, interactivity is "not a characteristic of the medium but a process related construct" (Rafaeli and Sudweeks, 1997). The extent to which messages relate back to one another in CMC communication is the test for judging the communication to be interactive (Rafaeli, 1998, Sundar et al. 2003). Many multi-dimensional typologies or constructs of interactivity emerge from CMC studies as they aim to quantify certain aspects of the CMC process that suggest interactivity. These include: direction of communication, timing, pace, level of control, responsiveness, complexity of choice, contingency, synchronicity and so on (for example Heeter, 1988, Haeckel 1998, Downes and McMillan, 2000). Such typologies are criticised for confusing different categories of interaction, for example conflating interactivity as 'process' (between humans) and interactivity as 'product' (between humans and machines) (see Stromer-Galley, 2004). This latter description however, does not cater for interactivity with other people *via* machines, unless both 'process' and 'product' are observed as occurring together in a layering of multiple interactivities. So despite the potential of digital media to extend opportunities for interaction, face-to-face interaction is still the normative standard, indeed a tradition in communications studies examining digital interactivity with other people (see Kiousis, 2002).

Criticism of this standard has already been noted because of the narrow methodological basis from which it emerges (see Baym, 2002). However, it also focuses too much on the outcomes interaction, instead of describing what is going on in the digital 'interactive experience' itself (see Kiousis, 2002). Also these contrasts and comparisons of media tend to 'idealise' certain features of a medium, thus ignoring the paradoxes of both positive and negative consequences

(McQuail 2000). However, CMC research does highlight that at least location and simultaneity (as aspects of context) had become irrelevant to effective communication in digital interactivity, prompting Baym (2002) to declare:

> "Interaction between two people in the same building is indistinguishable from interaction between people half a world apart." (ibid:p.64)

b) Proxemics and Interactivity

The 'compulsion of proximity' is a theoretical attempt to foreground face-to-face interaction not as a standard but as a natural human inclination – even where mediated communication is an easy or comparable option (see Boden and Molotch, 1994). "Co-presence", according to Giddens (1997), allows for the supply of richer information "than any form of electronic communication" (ibid:84). For this reason, it is the interaction of choice in certain situations. The compulsion of proximity theory is applied mainly to business communications – an arena, it must be noted, where the participants and outcomes of an interaction are not necessarily neutral.

The 'compulsion of proximity' implies that all face-to-face communication is equally good and all electronic communication is equally less good in these situations. However, in defence of users, some are simply more comfortable with using mediated interaction for 'genuine human interaction' and may find it 'more authentic' than face-to-face interaction (Rheingold, 2000). Equally, however, it can be argued that some are bad at mediated interaction whether having a poor phone manner, nerves in virtual conferencing or weak spelling and grammar in email, thereby displaying a 'compulsion to proximity'. In the business context, it is not the mode of interaction that is important but whatever achieves a successful outcome that makes the difference. Face-to-face encounters may yield successful results because small talk in the lift on the way up to the boardroom breaks down social barriers, leading to some commercial goal. For a skilled communicator, this can be a conscious strategy, making maximum use of verbal and non-verbal cues to achieve one's ends.

On the other hand, the distance (both physical and temporal) between addressor and addressee in digital interactivity allows for a 'cooling off period' and for judgment without the other participant's 'overbearing presence' (see Poster, 1994). This gap may even allow for greater individual autonomy – and perhaps control – in interaction. Remoteness can be a positive factor due to the lower levels of physical and social risk involved (see Turkle, 1984, Meyrowitz, 1985). If humans apparently need face-to-face interaction so badly, why do we "so regularly turn away from each other", to gaze at and bury ourselves in various media for satisfaction? (Poster 2002:481). Thompson (1994) acknowledges that the move from face-to-face to mediated interaction requires skills, which we are still in the process of learning.

Interaction is now more mediated than ever and the knock on effect is not less but *more* face-to-face interaction in order to make sense of the mediated interactions. The 'interaction mix' has been altered and the boundaries between public and private are shifting. Persistent normative comparison with face-to-face interaction however, means research is still lacking in the area of digital communication skills. However, one of the few areas where digital communication learning has been acknowledged is in 'netiquette' introduced early in CMC development, where non-verbal cues were designed as 'smileys' or 'emoticons' (see Danet, 2001).

c) Virtual, fluid, fictional - new media perspectives

Despite its information delivery and business generating potential, the most popular application of the internet by far by the mid-1990s, was the ability to communicate at a distance, due to the phenomenon of "being interactive" (see Poster, 1995:p.88). However, greater understanding of this communication potential was then (and perhaps still is) "limited by modern categories of analysis" (ibid). This limitation is seen in the preoccupation in the new media literature with the dichotomies that interactivity was seen to promote, such as 'virtual' as opposed to 'real' communities, fluid rather than fixed identities, or even fictitious rather than factual interaction (see for example Rheingold, 1993, Morse, 1998).

The "fictitious" nature of interactive communication via machines reflects its position as the poor cousin of face-to-face interaction but also relates to the ethics of remote control noted earlier (Morse, 1998). However, making negative assumptions about how aspects of new media 'detract from the human condition' suggest a prejudiced position from which to conduct research (Poster, 2002). In fact the potential for anonymity or even fictitious identity in digital interactivity with others may liberate users in their communications (see Bolter, 1996). Cyber theory sees the structural features of virtual worlds as having a direct impact on sense of self and capacity for community building, facilitating a certain fluidity in identity (see Haraway 1991, Papacharissi 2009).

Meanwhile, it cannot be presumed that one kind of interaction is more 'authentic' than another, without detailed analysis of the intentions and strategies of each participant. While critics of mediated interaction correctly highlight some limits of technology, they can also 'miss a great deal more' (Rheingold 2000:8). Qualitative value judgements cloud discourses around interactivity and how, where and why it is employed. Dualities such as success/failure, real/fictional, risk/safety, fluid/fixed etc. are certainly important questions to be asked of interactivity but they cannot be said to define it. However these binaries are useful because they focus on outcomes of communications, an element can be explored for the role interactivity might play.

d) Social networking – media and communications perspectives

Arguably, communicating at a distance is still the most popular application of the internet, as illustrated by the growth in 'social' networking. Analyses of social networking (SN) groups have been carried out in sociology and communication science since at least the 1970s, although not to same extent as CMC (see Garton et al, 1997). Early SN studies focused primarily on the features and structures of networks, patterns of networking and network formation and maintenance. The arrival of Facebook, LinkedIn and other commercial social network applications has multiplied both the level of use and research interest. This has introduced new multidisciplinary approaches to the increasing complexity of social networking *culture* and its effects on everyday life (see boyd & Ellison, 2007). The most recent research in terms of this study suggests a link between SN site structures and the cultures of communication (and interaction) they promote (Papacharissi, 2009). The architecture of SN sites may provide a 'social setting for interaction' which defines the level of private/public balance, the modes of self presentation and cultivation of tastes available and identity and community building features used (ibid). This reflects the emphasis on *context* as an important element of interactivity and which has long been the primary emphasis in social interaction. The literature on SN studies does not add much that is new in terms of discourses around interactivity but SN research may benefit from this discourse analysis of interactivity.

2.3.3 Digital Mode 3: Interactivity with Data

The third mode is associated with engagement with data, or digital 'content', for the purposes of information, entertainment, meaning, learning and so on. It includes literary theory perspectives, games design, e-learning, art and museum studies as well as sociology and communications studies.

a) Hypertext – more access to more data

In the late 1970s, issues around memory, storage and retrieval techniques were becoming a major challenge in accessing exponentially increasing amounts of information on computers. A new structure was proposed for interactivity with data in computers, reflecting a shift from a literary to a cognitive paradigm. The design was based on the "flux of invisible threads and rubber bands that hold the thoughts together" and resulted in the concepts of 'hypertext' and 'hyperlinking' of electronic and digitally stored information (see Nelson, 1981 after Bush, 1945). This structural shift in data storage is reflected in some influential theoretical perspectives on interactivity with data such as cognitive psychology, aesthetics and literary theory.

Hypermedia initially promised to liberate users from the threat of information overload. Interactivity was key to this freedom, offering new ways to access, organise and 'think with' the plethora of information available (see Nelson 1988). It carried an element of user choice - people were no longer passive consumers of information but active, indeed *interactive* users. This quality of choice and personalisation that interactivity was deemed to carry with it was central to the ideologies attached to these new technologies (Winston 1998, Shultz 2000, Lister et al 2003). However, questions have arisen around how interactivity may contribute to cognitive overload (Sundar, 2000). The 'pace of flow' of information in interactivity suggests there may be a 'threshold' of optimal interactivity beyond which it becomes 'cognitively burdensome' (Sundar 2004, see also Bucy, 2004).

Hypertext has a parallel history in analogue literary modernism, which celebrated the non-linearity, fragmentation and intertextuality of the surrealist authors. Early literary theorists of hypertext considered 'interactivity' and 'immersion' central to hypertext fiction (for example Bolter 1991, Joyce 1995, Moulthrop, 1991/2003). The ability to select paths, annotate and follow lexia, was said to reconfigure narrative (see Landow, 1992). Such interactivity with text reconfigures the author, or makes the reader a co-author, the reader and writer roles neither dying (after Barthes) nor being reborn but becoming intertwined.

However, the effects of hypertext theory on the concept of narrative are disputed. Some theorists suggest there is no significant change in principle between readers and texts, just more opportunities for more complex relationships or that the 'overlap' merely gets bigger (see Aarseth, 1997, Manovich 2001). Ryan (2001) argues that the supposed power of interactive narrative is based on two myths: the myth of the aleph' or the notion that a single symbol can potentially contain all history and knowledge, and the 'myth of the holodeck' (as proposed by Murray, 1991) or the idea that a wholly immersive 3-D multisensory virtual environment is either achievable or desirable. Ryan instead distinguishes four 'strategic' forms of interactivity describing different genres or 'narrative possibilities' involving interactivity, based on the binary pairs of internal/external and exploratory/ontological:

i. External-exploratory: such as in classic 'hypertexts' of Joyce, Moulthrop etc.
ii. Internal-exploratory: a virtual body in fictional world with limited action
iii. External-ontological: user as 'god of the system' with control over destiny of others
iv. Internal-ontological: the 'holodeck', complete immersion, unlimited actions and control

This typology harks back to the taxonomy-fixation noted by Bucy (2004) in earlier studies but also reflects a 'binary' tendency in research on interactivity, which is biased towards certain modes. For Ryan (2001) the characteristics of the medium facilitate the 'form of interactivity' – story or game – but the emphasis is on the participant's strategic goals in what they want to

do with the data (read/write or play) and this defines the quality of interactivity. Other binary approaches to interactivity also focus on user strategy, such as Lunenfeld's (1993) 'immersive' or 'extractive' interactivity, the latter allowing users to 'extract' information and meaning from texts. Meanwhile, Murray (1991) saw interactivity as essentially a combination of 'procedural' and 'participatory' aspects of digital environments (ibid:p.5). However, she argued that the pleasure of navigation could be a user goal in itself, without specific destinations or meanings being required. Indeed, attempts by software designers to anticipate user goals frequently fall short of achieving satisfying interactivity with data[5].

b) Aesthetics – the cognitive effect of interactivity

An alternative history of interactivity to that in computing, traces it through a variety of mediated art forms from the early 20th century (see Dinkla 1994, Manovich 2001). Early forms require a low level of effort by the viewer, at most perhaps movement in order to experience sculpture. Next, the viewer's mental effort is challenged with developments of montage, abstraction, and minimalism – leaps of association, reconstruction and representation must be made. Then, with new forms such as installation and performance in the 1960s, art places new demands on the audience, in the destruction of linear narrative (Genosko, 1997). This paves the way for interactive computer installations (Manovich 2001). The emphasis on viewer effort correlates to theories of constructivism over the same time frame, describing the 'active reader', a view strongly influential on early theorists of hypertext, as noted earlier, but also in active audience film and television theory (Morley, 1998). But the suggestion that hypertext interactivity can be compared to interactivity with art and is essentially a postmodern feature allowing users to become 'co-authors', contributes to another 'myth of interactivity' (see Manovich, 2001). This 'myth' is based on the notion that hypertexts objectify and represent mental processes, reflecting a "larger modern trend to externalize mental life" popular in cognitive psychology perspectives (ibid:p.57). Indeed evolutionary psychology has attributed the ability to process meaning to the externalisation of memory in technological rather than biological formats, giving humans the ability to deal with large amounts of information existing outside of the immediate context of communication (see Donald, 1993). The retrieval capacity of external memory has 'changed our memory architecture' so that to the expert reader, "the encoding strategies are so deeply established that the medium itself is invisible; ideas literally pop out of the page and the processing of the message is unconscious" (ibid:163). This active interaction with a display is seen as an essential tool for modern styles of thinking, influencing new directions in

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[5] For example the office assistant 'Mr Clippy' in Microsoft Office (editions 1997 to 2003) was highly unpopular with users, who considered it irritating and intrusive. Its anticipatory function possibly interfered with interactivity with data rather than enhancing it. Ironically, Microsoft used his unpopularity in an advertising campaign to launch Office XP, which included an 'interactive' game where users could kill him off. See "Microsoft cuts Mr. Clippy", by Claire Cozens, *The Guardian,* April 11, 2001 available at http://www.guardian.co.uk/media/2001/apr/11/advertising2 .

psychological research such as 'distributed cognition' and ethnographic studies in the workplace (ibid). It has also been influential in ubiquitous and distributed computing theory, in which the concept of interactivity with and between machines is relevant (see Dourish & Bell, 2007)

Manovich (2001) asserts that interactive hypertext links cannot be equated with interactivity with art because they simply ask us to "follow the mental trajectory of the new media designer" (ibid: p.59). Although Manovich is correct in clarifying who controls the hyperlinking *structure* (the designer), this control does not extend to the *action.* Neither does it preclude interactivity with data on a cognitive level by users. It merely suggests an intermediary in the interactivity between user and data, who could even be viewed as a remote participant.

By creating the interface, links, potential for feedback, control and engagement with data, the digital media designer facilitates interactivity in much the same way as an artist does in creating an artwork. But the designer does not control the level to which a participant will cognitively engage with the data anymore than an artist can control the level of meaning a viewer takes from their work. The art and satisfaction for both is in the challenge and may suggest a further layer or potential mode of interactivity, in the interface.

The act of hyperlinking no more implies that the user actually engages totally with all potentially connected data, than turning the page of a book suggests one is actually reading it and taking in all its intertextual lexia. The 'myth of the aleph' may be applied to art and other media objects as much as to new media in the overstatement of narrative or cognitive power. By questioning the potential for cognitive processing in hypertexts, Manovich privileges the cognitive interactivity of art and other media objects over the merely physical interactivity of 'new media'. This occurs partly because he relies so heavily on cinematic theory, which emphasises the psychological relationship between viewer and screen content (see Polaine, 2005). But it could also be another misapplication of critiques of representation, which are inadequate in discussing the 'power of the interactive experience' (see Penny, 2004)

Manovich's critique is important however, not so much for what it adds to discourses of interactivity, but in how it provides an alternative perspective exposing interdisciplinary tensions in the literature – between computer science and aesthetics, between cultural theory and information studies, between narratology and ludology. His later thesis that new media should be understood perhaps as an 'aesthetic stage' in all newly emerging technologies is more persuasive. The ability of the user to 'change the work through interactivity' is a key element in new media, and is also where 'ideological tropes' associated with interactivity (such as empowerment) emerge (see Manovich, 2003). But his earlier approach to the specifics of new media data structures is most pertinent to this review of interactivity with data.

c) More rival camps: Narratology vs. Ludology perspectives

Databases and algorithms form "the ontology of the world according to computers" (Manovich, 2001). Both support different forms of narrative – databases are associated with the web and networked content while algorithms are associated with games. Interactivity with data is facilitated both by hyperlinked database content and immersive algorithmic game play. This inevitably implicates the concept in the "narratology vs. ludology" debate, which has produced perhaps more heat than light in both games and interactivity research (see Murray, 2005, Pearce 2005, Raessens, 2006). The 'debate' is said to exist between ludologists who only focus on game mechanics and reject the analysis of games as narrative, and narratologists who argue that games should be analysed primarily as stories (see Newman, 2002, Frasca, 2005). There have even been suggestions that narratologists have 'framed' games as stories in an attempt at academic abduction (see Juul, 2001). However, others see little benefit in the polarising effects of the debate insisting that multiple perspectives are both valid and necessary (see Newman, 2002, Jenkins, 2003, Pearce, 2005, Raessens 2006). Where the debate does arise, interactivity is frequently cited as an issue in the 'game/story problem', with rival camps claiming its properties support their own arguments.

Interactivity is a defining feature of video games (Newman, 2002, Salen & Zimmerman 2004, Deen 2011) and specifically, it differentiates games from film (Darley, 2000). Interactivity allows the player to shape the narrative and control the game, but it also contributes to flow, engagement and immersion in the game world, exceeding its narrative constraints (see Fuller & Jenkins, 1995, Newman 2002). The player makes choices that are designed in the actual structure of the game, reflecting the *explicit* interactivity found in game play, although other types of interactivity (cognitive, functional, and those external to play) may be found also (see Salen & Zimmerman, 2004). However, the increasing focus on interactivity also reflects the development of an artistic medium (games). As a medium matures, research tends to narrow its focus towards the feature that defines it i.e. interactivity (Deen, 2011, see also Newman, 2002).

Game play problematises interactivity by highlighting the complexity and variety of experience it describes (Newman, 2002). However, games studies contribute an alternative perspective on interactivity, not only in terms of its intrinsic properties, but also in its utility for analysing other concepts such as HCI. In this regard, interactivity is considered crucial to the sense of 'presence' associated with new media technologies and games because it is required in order to perceive a computer as a social medium (Lombard & Ditton, 1997). Thus, it does away with the HCI perspective on communication because the participant behaves as though the medium were not there, in a similar mode to Horton and Wohl's (1955) para-social interaction (Lombard & Ditton, 1997). In other words, it is as though the interface has been removed (Ryan, 2001) and suggests that games studies and ubiquitous computing share

similar perspectives on interactivity. Because 'presence' is a perceptual illusion, it belongs to the human participant but also results from characteristics of medium, thereby combining two of the perspectives on interactivity separated in other media research. This suggests that interactivity with data which includes a sense of presence, bypasses the mode of interactivity with the machine (and HCI perspectives) and layered interactivities may become compressed into one at the perceptual level.

When people are engaged or absorbed in controllable but challenging and motivating tasks, like games, they experience a unique psychological state known as *flow*. Flow is central to activities which appear rewarding in themselves, without regard to other goals (see Csikszentmihalyi, 1975, Polaine, 2005)). The "flow-task" often requires total concentration and ideally the goals should be clear, feedback immediate and the participant should lose their sense of self (ibid). This flow principle relates directly to how interactivity operates in playful experiences (see Polaine, 2005, Newman, 2002), the sense of satisfaction being a feature of agency (Murray, 1997). Flow is also one of the components of interactivity with data in online communications, along with 'ephemerality' and 'theatricality' (see Danet, 2001). The combination of flow and presence contribute to immersion, the type of interactivity relating to experience rather than towards extracting meaning (Lunenfeld, 1993).

Laurel describes sensory immersion as one of "three very powerful enactment capabilities" of new technologies along with 'remote presence' and 'tele-operations' (1993:188). Yet because immersion can remove the sense of reality, it renders all experience as simulation (Baudrillard, 1983/2001) or blurs the boundaries between reality and simulation (Patton, 1997) or at least presents a reality that is manipulated to some extent (see Bolter & Grusin, 2000).

In games, interactivity between player and content is achieved through 'mapping' or the manner in which the actions performed by users are connected to corresponding changes in the mediated environment (Steuer, 1992). Natural mapping is a type of interactivity with the potential to make users perceive control devices to resemble real action, and it varies along a continuum (Skalski et al, 2011). Thus interactivity is a 'form variable' in video games and a valuable tool in analysis of game play rather than just focusing on their content (ibid).

In training contexts, natural mapping in simulators can provide users with a more complete mental model for how to perform the real-life actions they are learning, resulting in greater skills transference (Skalski et al., 2006, Skalski et al, 2011). However, it can also possibly create stronger mental models for negative and antisocial behaviour, such as firing a weapon or other violent actions (Skalski & Tamborini, 2006). Military application of natural mapping and interactivity is no longer confined to simulation for training and war games but extends, as noted earlier, to remote control battle in live operations (Patton, 1997).

d) Meaning and other goals of interactivity

Traditional sociological and psychological analyses of interaction emphasise context, the behaviour of participants, characteristics of the medium, participants' perceptions and so on. However, emphasis on the goal of interactivity, particularly in extracting *meaning* as outlined by Lunenfeld (1993) and others, reflects a 'symbolic interaction' perspective (see Blumer, 1969). This locates the source of meaning in the interaction itself and not something brought to it by participants (Blumer 1969: p.5). Both steps in the use of meaning in symbolic interaction (self interaction and interpretation as outlined earlier) can be viewed as the strategy undertaken by participants in interactivity with data. Therefore, from this perspective, the design of interface, the structure of data and its usability or 'affordance' may have a role to play in the construction of meaning or achievement of other goals in interactivity with data. Habermas (1982) makes a distinction between *communicative* action, which is 'oriented to reaching understanding', and *strategic* action, which is oriented towards achieving success (ibid:p.263). Reaching understanding is a 'peculiar goal', which cannot be pursued through communication in the same way as the teleological goals of strategic action. Because the participants in 'communicative' interaction want consensus on something, that 'something' itself does not exist in the world until agreement or 'understanding' on it is reached, by which time the communicative interaction has taken place (1982:265). Strategic interaction however can be one-way, where only one participant has a goal in mind. Paradoxically, it is easy to distinguish when the action sequence is complex (because shifts in strategy can be analysed), but harder in routine situations such as *commands* (1982:264). Strategic action can be 'open' where both participants are aware of the goal and are in communicative equilibrium. Or it can be 'covert' leading to distortion or manipulation of communication, a style of interactivity with data which could be observed for example where a user interacts with 'cookies' when browsing the web[6].

This relationship between strategy and outcome in interactivity was raised earlier in relation to ethical questions around telematics. The question now arises as to the role of interactivity when there are different strategies and outcomes for participants such as with commands. In a simple or 'routine' interaction between sergeant and officer, for example, the strategy and meaning extracted for both participants may appear similar. However, the balance of agendas, intentions and shared conclusions on meaning, so central to symbolic interactionism, may be more difficult to distinguish (Habermas, 1982). Commands are complex events, based on the exercise of control rather than mutual agreement, involving different personal goals (efficiency, obedience and so on) and concerned with a construction of meaning based on the structure of the relationship between participants. This relationship is inherently unequal and

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[6] Such 'invisible information' generated by internet use is a source of great informational and commercial value for advertisers, web site hosts, ISPs and so on, while users may be unaware both of the strategic goals of the interactivity and the interactive event itself.

is further shaped by wider institutional structures, rather than just the content and style of the communication itself.

Training can also be seen as interactivity with data in a context where participants have different goals and strategies, teacher and learner having varying levels of 'duty' and requirements for efficiency and so on. For example, instructional data used by a pilot operating a flight-simulation training program could involve the same strategies and interactivity with data as that of the drone operator remotely engaged in a real war. Data is represented by instructions but also in real-time feedback, which is simulated and virtual in the case of training but real for the drone operator. The difference is in outcomes.

Strategy appears to be a key element of interactivity with data. It relates to the 'characteristics of the medium', the procedural aspects of the communication or 'rules of engagement', and to the content itself as well as the affordance of interface design. But the goals or outcomes relate to the context, perception of participants and wider contextual issues and can differ greatly between participants even where the data and strategies used are similar.

The intentions, strategies and goals involved in interactive communications are abstract qualities and difficult to assess without access to the inner workings of participants' minds. They become even more elusive where strategies may be aimed, openly or in secret, at goals that exist beyond the interaction at another point in time. However, this makes them all the more relevant for discourse analysis because consideration of possible strategies and goals may reveal particular discourses in circulation.

e) Pedagogy and interactivity

The growth of computer-assisted education has brought a variety of perspectives on interactivity from education and pedagogical theory with some familiar debates emerging from those fields. For example, there is concern that too much emphasis is placed on trying to get computer enhanced learning to replicate real-life learner-teacher interaction (Sims, 2000) reflecting the face-to-face standards in social interaction. There are also concerns about 'rhetoric' from manufacturers around assumed educational benefits of interactivity as an inherent characteristic of digital technology (ibid, see also Kelley et al, 2007, Gillen et al 2007) reflecting suspicions of ideologies at play. And like several media theorists, some educational theorists also query the overall usefulness of such a 'fragmented, messy' concept as interactivity (see Rose, 1999).

Interactivity is most frequently associated with 'hands on', 'discovery' or 'constructivist' learning styles (after Piaget, 1950), which allow learners to 'construct' knowledge for themselves and direct their own learning (Duffy & Jonassen, 1992). Constructivist theory is particularly influential in the design of 'non-formal' learning environments for children using immersive virtual reality environments to enhance learning through play (see Roussou, 2004).

Constructivist and 'discovery' learning perspectives also dominate science museum design and construction, where interactivity is used to help visitors 'experience' science personally (see McDonald & Silverstone, 1990, Barry, 1998, Hughes 2001). The theory has its critics however who suggest it is not always appropriate or effective and can lead to cognitive overload (see Kirschner, Sweller and Clark, 2006)

Interactivity is closely bound up in education with one specific technology, the interactive whiteboard (IWB), which has produced a large number of studies with a variety of perspectives on the concept. A distinction has been drawn between the 'technical' interactivity and the 'pedagogical' interactivity of the IWB (see Smith et al, 2005, Gillen et al 2007). Research on IWB use in classrooms in the UK has shown some consistent evidence of benefits of 'technical interactivity' for *teaching practice*, but the impact of 'pedagogical interactivity' on *learning outcomes* is questionable (see Smith, 2001, Potter, 2007). Indeed IWBs may reinforce traditional instructional learning styles because of their fixed location at the front of the classroom, while the quick manipulation of images may even reduce teacher-pupil dialogue (Gillen et al, 2007). However, some evidence of 'engaging pedagogy' has been observed but this depends on the use not just of the IWB hardware but also of 'quality digital resources' in data (Hunter and Beveridge, 2007). Much of the positive feedback emerges from qualitative studies, which report 'teacher appeal' in the technology rather than specific educational outcomes for students (for example Judge, 2007).

In sum, there is generally more potential observed in the technology than proven outcomes. IWBs have been described as an expensive proprietorial hardware solution to a relatively simple problem – making a personal computer available to a large group – perhaps more easily and affordably achieved with a projector (see Kelley, 2007, Becta[7]).

f) Please do touch? Museum studies on interactivity

Interactivity and learning are both also connected and contested within the museum community. Until the late 20th century, museum studies was concerned mainly with the traditional educational and conservation focus of these institutions (Fyfe, 2006). However, a cultural turn followed by a turn to the visitor has brought museum studies to the attention of sociologists, cultural theorists and even media and communications researchers (see Hooper-Greenhill 1992, McDonald 2002). The focus on interactivity in science museums emerged during a period of huge "intellectual, financial and technical investment" in science presentation, driven by a perceived crisis in public knowledge of science (see Barry, 1998). This use of digital technologies for display and communication has repositioned museums within the digital space, to the extent where they are mooted as potential drivers of the

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[7] Becta was closed in January 2011 – but a general report on ICT and Pedagogy, cited in the references for this analysis, covers the issue and is archived at
http://www.education.gov.uk/schools/adminandfinance/procurement/ict/a0073825/becta [accessed March 10, 2011]

'information society' (Keene, 2000). Indeed, digital media objects that have "cultural" content "appear to particularly favour the database form" (see Manovich 2001:p.219) thereby encouraging interactivity. This has allowed museum studies discourses around interactivity to filter through to cultural studies and into public discourses, not just from the recent digital experiences, but from the older museum rhetoric of exhibitionary technique (see Witcomb, 2003, 2006).

The 'fetish' of interactivity is now a central feature of museum design, particularly in science museums and can be traced back to their 19th century origins (see Hughes 2001, Witcomb 2006). The rhetoric of "exploring" and "touching the past" along with "discovery" and "hands on" learning shows how pedagogic theories inform interactive exhibits in terms of the goals and strategies in communication. However the design of interactive exhibits in museums is found more often to be the didactic and stimulus-response style, resulting in inconclusive pedagogical outcomes. The 'discovery' style on the other hand is more frequently associated with children's museums (see Witcomb, 2006).

Interactivity thus should instead be viewed as an aesthetic tool for museums (Henning, 2007) and as a 'mode of display' rather than an exhibition object (Witcomb, 2003). Nevertheless, museum 'interactive' interface design is also frequently informed by a traditional HCI or AI model, which is unsuited to a public venue where users interact in groups (Reading 2003, Heath et al 2005). Successful interactives are thought to happen by 'luck' rather than by design (Heath et al, 2005, McDonald, 2006). More generally, ideological tropes associated with interactivity such as 'empowerment' and 'participation' are utilised in science museums to bridge the perceived gulf between science and society (Barry, 1998). Indeed interactivity in museums is deliberately associated with ideas of 'choice' and 'democracy' as though these are natural partners for the concept (McDonald, 2002). Therefore, the 'interactive' museum is part of a branding exercise in the increasingly homogenised design of the museum experience internationally (see Hughes, 2001).

In the case of museums, the strategies and procedures of interactivity with data are only beginning to be understood in terms of the venue itself, the changing nature of its communicative features and purposes and its similarities and differences with other communication contexts. Indeed it is becoming increasingly appropriate to regard museums as media not least because they 'encourage' interactivity (see Silverstone, 1994). Museums appear to represent a communication context where many of the modes of interactivity – social, symbolic, mediated, with machine, others, data and system – can be seen to operate simultaneously, offering unique insights for research and evaluation.

g) Commercial goals of interactivity

Where interactivity with data involves overtly commercial strategies and goals, perspectives from the advertising, marketing and business communities come into play. Deep concerns were expressed in the advertising industry at an early stage in digital media development over the impact of interactivity on structures and revenues. Early studies questioned the effectiveness of interactive ads on the web, suggesting they may be a waste of resources (Bezjian-Avery et al 1998) or at the very least "may not always yield positive communication outcomes" (Sohn et al., 2007). Fears were expressed regarding 'detrimental effects' of interactivity because increased user control might interfere with the advertising message (Liu and Schrum, 2002).

Advertising theory definitions of interactivity describe "the ability to control information" where the consumer actively traverses the information, contrasting it to 'traditional' linear advertising to which the consumer is passively exposed (Bezjian-Avery et al, 1998:p.24). Interactive media therefore change the traditional one-way communication process of marketing and 'persuasion' to a two way process of communication (Stewart & Pavlou, 2002). Interactive ads can however, involve much larger amounts of content which potentially engage consumers for a greater length of time while their structural features allow users to take in more information (Macias, 2003). But as consumers become more literate in digital media use and product information, their expectations of interactivity also rise, which can produce negative effects for advertisers who do not conform to these expectations (Sohn et al, 2007). The "rush" to implement interactivity should be "tempered… by consideration and understanding of precisely what interactivity is, what it can do well and more importantly what it cannot do" (Liu & Schrum 2002:p.63)

Further advertising definitions tend to present interactivity in terms of narrow functions such as measuring customer support (Ghose & Dou 1998), modelling online customer experiences (Novak, Hoffman & Yung 2000) and linking levels of interactivity in web sites and their effects (Coyle & Thorson, 2001). Many are influenced by early media and communications studies theories (for example Rafaeli, 1988, Heeter, 1989, Steuer, 1992, Ha & James, 1995). Thus a widely cited definition in the advertising context reflects many of the relevant discourses, defining interactivity as:

> "…the state or process of communicating, exchanging, obtaining and/or modifying content (e.g. ideas, entertainment, product information) and/or its form with or through a medium (e.g. computer, modem etc.), which responds to both the communicator's and the audience's communication needs by including hypertext links, reciprocal communication etc." (Macias, 2003:p.34)

This broad definition manages to incorporate many of the modes and views of interactivity found in other research. However, the reference to 'audience' (traditionally passive receivers) suggests differing goals in these communication events, still considered one way from advertiser to consumer.

2.3.4 Digital Mode 4: Interactivity with Systems

This fourth and final mode of interactivity describes communication events where users engage in interactivity as part of an entire system, connecting users potentially to multiple machines, others and/or data, or even society. It represents the widest potential sphere of interactivity so far and is associated with the Internet and worldwide web via wired or wireless connections, digital interactive television services, the mass media (online or via digital television services) and systems relating to e-government. Again, this is a mode of interactivity which, by necessity, requires the presence of other modes – including machine, data and possibly other people – so earlier perspectives are often still relevant in assessing such layered interactivities.

a) The internet – empowering, convergent, uneven

The internet is the most recognisable physical manifestation of interactivity with a system. Although users connect through a variety of individual computing devices, once on the network the opportunities go beyond just machine, others and data to extensive communication possibilities. Because the internet facilitates so many of the modes and varieties of interactivity outlined in this review, it is the medium most associated with interactivity (see Lanham 1993, StromerGalley 2000, Kiousis 2002).

The nodal, non hierarchical, decentralised structure of the internet, (which was designed this way for security purposes), promotes interactivity (Dinkla, 1994). The development of 'cyberculture' through the interactivity of internet CMC, provides the potential for creating new identities and online communities (see Stratton, 1997, Poster, 1998, Manovich 2001). But according to Tim Berners Lee, the architect of the 'www' (a public subset of the internet), the web was originally designed as "an interactive means for collaboration and augmentation, but has instead become a static medium for hypertextual publication" (see Simpson et al, 1995). This illustrates how interactivity may operate in different ways according to the different systems with the internet as a whole (for example, www, email, private networks and so on).

Different subsystems of the internet are visible in e-government services, which show how the internet provides opportunities for interactivity directly with government (Hacker, 1996). Its interactivity may even create 'active' citizens with potential for participation in and creation of a virtual community, which is both cultural and political (see Bentivegna, 2002).

Pavlik (1998) offers the internet as the most 'compelling scenario' for successful interactivity because all users on the superhighway "can be both a source and receiver" and the key is user choice and control (ibid:p.137). Thus interactivity empowers users and changes the traditional methods of production and distribution of content. But the same structure that suggests interactivity of equal participants with balanced 'symmetry' is endangered by differences in access, bandwidth availability and control of download and upload by internet service providers (Bagdikian, 2003).

The use of generic terms like 'superhighway' and even 'internet' itself to describe all the subsystems operating within the network, belies the different experiences available within and the various levels at which interactivity is seen to operate. The compression of the internet into a single entity in discourse, reflects the convergence of technologies and industries around this network. Indeed the internet could be seen as both a tool, a measurement of and a milestone in the convergence of ICT industries, data and networks. Meanwhile convergence and interactivity have had similar trajectories in the literature, both consistently part of the new media discourse but both also considered problematic. A growing list of definitions threatens to render convergence "a buzzword, thrown around casually in discussions of media, technology and journalism" (see Gordon, 2003:57), a fate similarly bestowed on the concept of interactivity.

The two concepts are related in that convergence is seen to be facilitated by the interactivity native to ICTs and new media. However, Jenkins (1998) makes a distinction between 'media' convergence which implies technological fusion and cross-platform content, and 'cultural' convergence which relates to audience relationships with converged media, content and the meanings arising. The former describes 'structural convergence', the dominant business view reflecting a the merger of technological platforms, the businesses that operate and use them and the media and content they carry. Interactivity with and between *systems* facilitates structural convergence while the interactivity of *data* facilitates convergence in use. However, this merging of data, production and delivery reflects a convergence of modes which "erodes the one to one relationship" between a medium and its use (Pool, 1983:p.23). A similar convergence of the modes of interactivity may also have occurred into one clustered and problematic concept.

Nicholas Negroponte of MIT is considered to have been influential on convergence perspectives in industry, through his regular presentations to executives during the 1990s. He frequently used an illustration showed three overlapping circles representing the broadcast/film industry, the computer industry and the print/publishing industry, predicting they would overlap totally by 2000 (Gordon, 2003). This convergence however would allow not just for structural overlap but for content and cultures of interactivity to converge also.

The interactivity of the internet and the convergence of media technologies, industries, content and uses places the focus back onto 'control' in communications. Interactivity with such a system gives users control over content and delivery, time and place, empowering them structurally, culturally and politically. However, industry also maintains control over access, content and distribution, within increasingly converged structures. This tension creates opportunities to explore the changing strategies between participants that are facilitated by interactivity.

b) Interactive Television – 'red button' interactivity

Interactive television is perhaps the most commercial manifestation of interactivity with a system, with an attendant level of scepticism in the literature over its capacities, suggesting it is either "a huge ball of hype or the beginning of yet another epic wealth-gathering scheme" (Rheingold 2000:398). The concept of interactive television dates back to the 1950s, but major investment in public trials in the 1990s brought it to the attention of new media researchers who immediately questioned whether there was any public demand for such an expensive technology (see Lee & Lee, 1995, Pavlik, 1998, van Dijk & de Vos, 2001, Kim & Sawhney, 2002). Warner's Amex Qube experiment (1977 to 1984) was the most notorious example, which "never lived up to its hype", according to Viacom chairman Sumner Redstone, a self confessed skeptic on interactive television, speaking to the National Press Association in 1994 (cited in Lee & Lee 1995). Indeed, the 'failure vs. success' and 'reality vs. hype' frames dominate discourses around interactive TV for much of the twentieth century (Kim & Sawhney 2002).

The definition of interactivity at play in the context of television has highlighted differences between industry and academia (see van Dijk & de Vos, 2001). Academic research has of course no agreed definition of interactive TV. It is seen as a 'variant of television' (Kim & Sawhney, 2002), distinct from regular 'passive' television viewing (see Lee & Lee, 1995) but one which only provides a form of extra 'selectivity' (see Pavlik, 1998). The interactivity generated is generally orchestrated and curtailed (see Holmes, 2004b) but is increasingly central to the structuring of the interface between audiences, texts and industry (see Holmes, 2004a). The discourse employed by industry representatives stresses 'freedom' and 'choice' for viewers, but in practice industry is more concerned with defining a workable business model than viewer experience (van Dijk & de Vos, 2001).

Television had traditionally been related to the ideology of control of production, distribution and consumption of content, while interactivity represents a move away from control from the centre (Kim & Sawhney, 2000, see also McMillan 2002). Yet interactive TV follows that traditional television economic model because it is driven by industry. However, to succeed,

interactive TV would need a combination of computers, networks and televisions and a greater level of interest from users to realise the kind of interactivity it proposed.

The broadcast perspective contrasts with that of the ICT industry. By 1995, the rise of personal computers and the internet had industry torn between whether the television set or the personal computer would deliver what Bill Gates described as the 'interactive market' (Gates, 1995). Gates and Microsoft were advocates of a kind of convergence based on a 'common architecture for the exchange of digital information' (ibid: p.109). This shifted focus from the medium to the content, due to the cross-platform possibilites for distribution of digital content. A TV 'programme' could be viewed on a mobile phone or laptop as easily as on the box in the living room. Content would be 'king' as Gates (1995) then announced.

These competing discourses around interactive TV raise broader issues about the systems to which it can connect users. The idea that the information society itself could be delivered through interactive digital TV was a prominent element of the UK digital television policy debate (see Sourbati, 2011). Similarly, the first Irish government information society policy report described plans to "fully enhance the cable and wireless TV network with broadband technology allowing two-way interactivity" (Forfás, 1996)[8]. Another 'flagship project' cited was "an interactive Irish television series designed to engage the Irish public in an exploration of the potential of the Information Society".

However, interactive services disappeared from the agenda for switchover to digital terrestrial television (DTT) in the UK by 2004. This is attributed to the 'rigorous' policy attitude taken first to implementing switchover, which did not wait for interactive technologies to be developed, then to the market-led approach to both diffusion of access and skills to use interactive technologies (which promoted non-TV platforms) and finally, to the political promotion of 'universal access' meaning access to more channels rather than to any enhanced services (see Sourbati 2011). The reliance in Ireland on data from the UK to support policy direction in this and other areas suggests these developments may also have been of influence on Irish policy as interactive services also disappeared from the agenda at a similar time.

Murphy's (2009) case study on Irish broadcasting policy describes how the regulatory body for DTT in Ireland, the ODTR, became responsible for issuing broadcast licences partially due to a political vacuum. The licenses were designed within a telecommunications framework, and thus did not take the content and services elements – and therefore the potential interactivity – of broadcasting into account. The broadband services that DTT could have provided (and which would also have facilitated what was regarded by 2001 as the better variety of interactive television, that on the web), made the ODTR uncomfortable from a licensing perspective. The regulatory body saw it as the bundling of a telecoms spectrum

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[8] *Information Society Ireland: Strategy for Action – Report of Ireland's Information Society Steering Committee,* Forfás, 1996

resource with the physical broadcast network, which it felt went against the EU licensing directive[9] under which it operated (2009:pp185-186). Such governance issues along with technological difficulties, rises in the cost of development and above all political vacillation over how to approach broadcasting, all contributed to the delay of both DTT and interactive television in Ireland to this day.

c) Information Society perspectives

The 'information society' (IS) is a major concept or 'meta myth' (Preston, 2007) in circulation within media and communications since the early 1990s but with deeper roots in social, cultural and economic theory from at least the 1960s (see Castells, 1989, Bell 1973, Machlup 1962 etc. as cited in Webster, 2002). There are strong and conflicting views on what defines the IS, whether it is really a break from previous types of societies, whether it is a global phenomenon that can be observed in similar terms across different locations, or whether it exists at all or is merely a utopian ideal. The source of much dissatisfaction with the theory is the language used in discourses around the IS. The terms 'information society', 'knowledge economy', 'knowledge society', 'e-society', 'learning society' and so on, are often used interchangeably. Although there is academic precedent accepting that they refer to broadly similar things (see Preston 2007, Bell, 1973), indiscriminate use of 'society' and 'economy' for example has tended to obscure the difference between the two concepts (see Peters 2001).

One of the concepts that arises in discourses around IS, is the 'interactivity' of ICTs, a feature promoted in some of the earliest EU policy documents, but not always specifically defined. The Bangemann report (1994) states that ICTs are the 'building blocks' of the IS which will see "mainstream demands for interactive individual information and leisure uses" (ibid. p.22) and lists "interactive multimedia" as some of the "new basic services" needed in the IS (ibid. p.23). This presents a relatively generic 'characteristic of the medium' definition of interactivity. One of the 'priority applications' identified in the Bangemann report is the personal home market and the "interactive and transaction applications related to teleshopping, telebanking, entertainment, leisure" (p.24). This broadens the implied definition of interactivity, describing it as a feature of a whole 'system' of applications, programmes and software. The report also suggests that the possible "CD-ROM interactive disk based programming and content" will allow the private sector and public authorities to enter the distance learning market (p.26), mixing a 'characteristic of the medium' description with both pedagogical and commercial perspectives. Another of the major applications concerns "Europe's brain power" which is to be connected via a network that is "high bandwidth, high definition, carrying interactive multimedia services" linking universities and libraries all over

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[9] Article 10, European Union Licensing Directive 97/13/EC

Europe (p.27). This returns interactivity to the 'application' definition but emphasises empowerment and access to knowledge in particular, which is increasingly presented as an important aspect of IS policy.

The follow up action plan describes more specific instances of interactive ICTs, such as "interactive data exchange possibilities" under the public procurement directives, and the development of "interactive applications" at pilot "urban information highway" sites in European cities (European Commission, 1994). These firmly place interactivity as a feature of the application or service rather than the technology or medium in use. But the transition of the definition in use from characteristic to application has technologically determinist undertones – the ICTs are inherently interactive in nature, which then naturally leads to interactive services and applications being developed.

Interactivity is also frequently invoked in Irish discourses around the Information Society. For example, the Information Society Commission in Ireland consistently recommended implementing 'interactivity' in public services and government websites or delivery of public services in an 'interactive way', in several reports, although many recommendations were not implemented (see ISC 1998, 1999, 2001, also Caffrey 2007). This suggests that interactivity is seen as integral to e-government, a feature of the information society. Indeed, the 'level of interactivity' of public service websites was a criteria used in benchmarking the development of e-government services in different countries across the EU (see Finger & Cotti, 2002).

Discourses around information society policy and theory suggest that interactivity with the system (whether through television or other ICTs) was viewed both as a potential instrument and measure of the realisation of the information society. However in practice, the market-led implementation of a limited policy vision has ensured a somewhat vague and curtailed experience of interactivity with systems within a highly controlled ICT industry structure. Cybernetic analysis can illustrate changing patterns of control within society where solutions to key questions rest on control of the rate, direction, flow and quantity of information. Mediated interactions are not just "frozen moments, of the fluid social interactions constituting them" but as Haraway argues are also "instruments for enforcing meanings" (1991:p.164) reflecting shifts in the wider context. The ultimate consequence of seamless cyber-interaction is not just the reconfiguring of the machine, but the reconfiguring of the body and the 'outside world'.

Interactivity with the internet or television frequently has a commercial element to the outcome, which can be traced back to a one-way operation of feedback and control. This may place deliberate limits on interaction (see Stratton 1997) and is closer to the structure of information flow in mass communications (McQuail 2000). This exercise of control from the centre alludes to Bordewijk and van Kaam's (1986) 'allocution', rather than the 'conversation' associated with digital interactivity. Habermas' distinction between

communicative and strategic interaction is useful here, in assessing digital interactivity with the system via the observed outcomes, particularly where they may be political.

2.4 Concluding remarks on the literature on interactivity
This review has shown that the concept of interactivity is dealt with extensively across a variety of disciplines, albeit frequently within the prescribed frameworks of debate in those fields. This has allowed sociologists to focus on questions of the individual and context resulting in views on interaction – social, dramaturgical, symbolic – that reflect the different schools of thought in sociology. Communications theory reflects on issues relating to the process and semiotics schools of analysis, argued via the properties of face-to-face, text and various forms of mediated interaction. Although multi-dimensional definitions have been developed to deal with the multifaceted nature of interaction, even these strategies can introduce levels of rigidity, which only 'allow' certain aspects of interactivity into a particular model (for example J Jensen (1998) strictly polices the border between sociology and communications studies). These apparently rigid frameworks in the literature have arguably created artificial boundaries around where and how research into interactivity can be applied and consequently there are missed opportunities.

However, the literature still reveals possibilities for alternative views of interactivity that exist outside of those prescribed frameworks, or more precisely, because of them. This review presents the literature on interactivity as evolving *theory* rather than following the evolution of a concept – new modes of interactivity are identified, new technologies are available to mediate interaction, new forms of interactivity are observed and new theories are tied to developments in sociology, media and communications studies, informatics, computer science, aesthetics, literary theory and so on. The evolving academic context demands a more flexible approach to studying interactivity. This is presented in the *modes* of interactivity, each emphasising different elements of communication such as context, action, meaning and strategy, which are relevant to all disciplines. The second part of the literature review will briefly address the elements of interactivity as emphasised in the different modes and some of the larger discourses arising out of the review.

CHAPTER 3
Elements and discourses in the literature on interactivity

3.1 The core elements of interactivity

Each of the analogue and digital modes of interactivity emphasises a particular aspect of communication associated with interactivity. Four elements in particular emerge from the literature as consistently presenting insights, challenges, debates and difficulties in the discourses around interactivity - context, action, outcome and strategy. These are summarised as follows:

a) *Context* is the primary focus of sociological theories on interaction and refers to the 'who', 'what', 'where' and 'when' in a communication event. The relationship between participants, and their attitudes and orientation towards their 'social environment' as part of the context, is *equally* as important to the communication process as the participants themselves (Fiske 1990). Symbolic interaction theory allows for different kinds of participants (e.g. not just humans but texts, data etc.) and introduces potential to reconfigure participant relations. Meanwhile the 'basic model' of social interaction in sociology includes "close physical proximity' but new mediated interactions create a 'time-space convergence', which makes location and distance of less concern (Giddens 1997, Baym 2002). Cybernetics and telematics take advantage of this convergence with remote control but also raise ethical issues, suggesting context may shape the perception of users of the effects of their actions. However, cultural media theorists point to the communicative benefits of distance in mediation along with the liberating effect on participant self-perception (see Poster 1995, Rheingold 2000) The boundaries of where interactivity begins and ends are also shaped by context (Goffman 1981, Giddens 1997) but new mediated contexts place emphasis on 'how' interactivity takes place rather than 'where' and 'when' (Meyrowitz, 1985). The computer sciences of artificial intelligence and ubiquitous computing along with aesthetic and ludological perspectives have a particular interest in the shifting boundaries between participants of interactivity and the permeation or even disappearance of interfaces. This further emphasises the importance of context in understanding how and why interactivity takes place and to what effect. However, the context of face-to-face communication persists as a normative standard in the literature especially in specific institutional contexts such as education.

The focus on context has shown that while issues of physical location, characteristics of medium and behaviour of participants are central, it is also useful in understanding how and why interactivity takes place. Further research could address whether context may be in fact defined by the mode of interactivity, rather than the reverse as has been the case to date. Context is a central feature in digital media production where interactivity in communications

is designed and developed. A better understanding of its relevance to how interactivity operates would be of benefit to the design process.

b) *Action* refers to the substance of communication. For interaction to exist it must contain observable acts (Duncan 1989) which consist of verbal and non-verbal communication (Giddens 1997). However, communication is still only one-way when 'one source sets the agenda' with little opportunity for feedback (Shultz 2000). It is not just the nature of the participants' behaviour that matters, but how they relate to each other, in other words, the communication in interaction must appear to be *two-way*. But it is merely 'reactive' until the two-way flow takes into account, not just previous messages, but the manner in which previous messages relate to each other and back to previous messages (Rafaeli and Sudweeks 1997, Kiousis 2002).

Variations on the speed, flow, control and inputs available in interactivity are associated with the characteristics of different media and have produced a vast array of typologies and taxonomies of interactivity in media and communications research. However, user perceptions of these characteristics and potential layering of different modes of interactivity have produced further rival definitions. Aesthetic, hypertext and psychological theory focuses on the cognitive aspects of participant activity, and the use of internal and external memory and processing tools in negotiating meaning. However, questions still arise as to the relative power of participants to influence action and outcome, particularly in interactivity with data in the form of text, narrative and/or game. Indeed one study has called for further research into the forms of *power* facilitated by different modes of interactivity (see Richards, 2006). The relationship between participants relates to context, but interactivity with data presents both freedoms and constraints in its potential for action.

High levels of feedback and control for participants can eliminate contextual constraints such as time and distance allowing for remote or asynchronous communication as in CMC and telematics. Meanwhile presence, flow and immersion describe exceptional levels of feedback and control which act to remove the interface or 'mediation' of interactivity placing participants, at least in terms of perception, right in the middle of the action, particularly in games and virtual reality environments.

The focus on action highlights that the simple communication process models and sociological scenarios are inadequate when it comes to analysing digital interactivity in virtual worlds. One-way, two-way, reactive…even feedback, cybernetic and telematic impulses represent only a small part of the action. Questions of quality, equality, control and agency and the participants' perceptions of each, is where the effects of interactivity may lie. Again successful outcomes depend on understanding the level of action possible within a given context.

c) *Meaning* (or *outcome)* is emphasised in symbolic interaction and literary theory as both a goal of interactivity but also as emerging from the process itself. Analysis of meaning can be useful in identifying where there is balance in communication such as in 'communicative action', which aims to achieve consensus or agreement between participants (see Habermas, 1982). The process of constructing and negotiating meaning is both cognitive and sensory. Aesthetic and ludology perspectives on interactivity focus on the potential for reconfiguration of data or texts, allowing alternative meanings to emerge. The 'extraction' of meaning may only be a goal of one particular type of interactivity (see Lunenfeld, 1999). Other perspectives see satisfaction in the process of interactivity itself, especially in games, without any other communicative goals being required (see Murray 1997, Polaine 2005).

References to active users and audiences allude to literary and film theory perspectives on how audiences actively interpret and contribute to making meaning. The construction of meaning alludes to constructivist theories of learning which are influential in educational and pedagogical theory and also the institutional context of museums. Meaning is an aspect of interactivity with data and with entire systems. Such systems, for example e-government communications, can communicate meaning not just in terms of individual communication events but larger ideas about how society and its citizens manage their informational assets and needs. Again cybernetics has a perspective on how meaning is controlled between participants in interactivity across all modes.

The focus on meaning has indicated a possible new direction in the application of the symbolic interaction in the analysis of interactivity. The multi-layered process of symbolic interactionism opens up the possibility that multiple levels of interactivity can take place in apparently simple communication events. Digital media can operationalise non-linearity in more easily quantifiable ways and therefore perhaps offer the scientific basis for symbolic interactionist theory, so lacking in unmediated interactions. Indeed Fiske notes that symbolic interactionism may find a more natural home in the digital paradigm of new media, where the code is easier to understand "because their units are clearly distinguished" (1990:65).

d) *Strategy* (or intention) makes interactivity particularly relevant to communications research. Interaction is essentially a communicative act in that the interaction has communication as its *purpose* (Jensen 1998, McQuail 2000). The process school sees intention as "a crucial factor in what constitutes a message" (Fiske 1990:3), while even semiotic analysis requires intended interpretations as in symbolic interaction. Habermas' (1982) distinction between communicative and strategic interaction is useful in assessing the intentions and strategies of participants in interactivity. It raises questions about how

interaction impacts on the power play between participants in communication (see also Shultz, 2000).

Feedback perhaps balances the agendas at work but only a complete analysis of the participants involved, their experience and the observed goals and outcomes can determine how it impacts on interactivity. Pedagogical, military, political and commercial goals and/or contexts can be an indicator of imbalance between participants and in the agendas at work, even with significant feedback, but this does not necessarily negate successful interactivity. Participants can have two completely separate and opposing goals for communication and yet interactivity is still significant in their achievement. Indeed some of the more ideological discourses around interactivity, suggesting its empowerment of users for example, can be found in the perspectives with significant 'investment' in the outcomes of interactive communications.

The focus on strategy directs attention to the outcomes of interactivity, in order to better understand its operations. The intentions and strategic goals of participants can impact directly on the outcomes, but the relative power between participants, shaped often by context, dictates the strategic options available. This allows for mass communications analysis of macro political economy intentions as well as micro social and cultural intentions within individual interactive communications. Both are useful in assessing how commercial as well as personal, political or social strategies impact on interactivity.

3.2 Myth, hype and magic

A recurring discourse in the literature on interactivity is its representation as myth, hype, buzzword, magic power or fetish. These depictions illustrate frustration with its mercurial character and some scepticism about the ideological tropes associated with it. However, they also show the power of discourse in circulating qualitative ideas around a concept and potentially framing it from a particular perspective. Discourse is a form of power since both the process of discourse and the product of discourse (the particular set of meanings and narratives emerging) limit the possibilities of interpretation and privilege certain meanings above others (Van Zoonen, 1994).

The myth of interactivity is founded on the 'myth of newness', a familiar discourse in new media research (see Manovich 2001). All developments in media technology could be said to borrow from, refashion, perhaps improve upon, pay homage to, even remediate, older forms (Bolter & Grusin, 2000). All media go through a 'new' stage where they acknowledge and question "the mythic character and ritualized conventions of existing media" indeed going on to mediate their own history before they join the ranks of older technologies (Gitelman & Pingree, 2003:xx). This sense of 'flux' creates the space for positive and negative

possibilities, issues and anxieties, risks and potential (ibid:xv), all of which have been observed in the literature on interaction and interactivity.

Manovich's (2001) critique of interactivity's mythical character emerges from a perspective, which privileges aesthetic and cognitive processes over others, reflecting a narrow analytical approach. Meanwhile Ryan (2001) invokes two further mythical precepts (the Aleph and the Holodeck) relating to interactivity in order to critique suggestions that it reconfigures narrative. This also stems from a narrow analytical view (the debate about the place of narrative in games and virtual reality) and is further employed to create a more restrictive binary typology of interactivity in operation. The effect of these representations of interactivity is to render any further debate about its form irrelevant. After all, myth is inherently a type of speech and a mode of signification, which is not defined by substance or form or by the object of its message, in this case interactivity (see Barthes, 1972). Therefore no consensus definition or definitive understanding of interactivity in operation will do away with these myths. They exist precisely *because* they are conveyed in discourse (ibid: p.107).

Concerns in the literature over the 'hype' surrounding interactivity are founded on suspicions about its associated ideologies, again a familiar critique in both 'old' new and 'newer' new media studies (although celebrations of hype are rare in any academic field). It also stems from suspicions about the interests promoting the 'interactivity of media', particularly if commercial or political. The restricted definitions of interactivity emerging from rival camps in the literature have been useful for some in the critique of hype. If interactivity is a characteristic of a medium, hype can be tested in the marketplace and does not survive where the characteristics do not live up to expectations, such with the failure of the CD-Rom (Winston, 1998). The perception of users however, is influenced by their sense of control, power, immersion, presence and so on, in an interactive communication event. It is frequently related to successful outcomes of specific strategies, or the satisfying sense of agency in the process. Positive outcomes lend themselves to empowering discourses and possibly hyped pronouncements about interactivity. Where the outcomes do not match the expectations, the hyped concept is revealed to have feet of clay (often again in the marketplace) and the impact is felt from a communicative and even commercial point of view. Analysis of and references to 'hyped' commercial perspectives on interactivity are frequent, perhaps because of the potential contribution to studies on the political economy of media and communications. Discourses which feature the 'magic' powers and 'fetish' properties of interactivity however tend to emerge from cultural, aesthetic and literary theory perspectives rather than commercial interests. Interactivity is seen as a special facility that allows users to construct meanings in a process that appears unconscious, even beyond analysis (for example Landow, 1992). Critics of these supposed magical powers suggest this is still a form of hype (for example Aarseth, 1999). But this is hype which goes beyond generic empowerment of users,

or commercial gain, to suggest interactivity has associations with much wider cultural implications. The psychological and symbolic features of interactivity are implicated in fundamental reconfigurations of the relationships between audience and text, meaning and action, citizen and society. Finally, the fetish of interactivity makes its generic empowerment associations attractive in instrumental form by aligning contexts and institutions with these potentially culturally transformative ends, making it ultimately a valuable branding tool (see Hughes, 2001).

The result or outcome for users of this mythical, hyped or magical feature of media and communications is frequently though not always 'empowerment'. Users are 'empowered' to choose their own navigation paths, take their own meanings, register pleasure or dissatisfaction with an experience and contribute to content. Higher levels of empowerment suggest the ability to adopt certain identities, to form communities, to generate momentum and action whether civic, cultural or political, ultimately merging machine and human in the cyborg (Haraway 1991, Hayles 1999). Of course the other participants in these processes, including the producers and industries behind the interactive communications, may also be similarly empowered.

3.3 A question of faith? Religious discourses

Perceptions, ideologies, myths and magic are terms which suggest a quality of interactivity that is somehow mystical, even a quasi-religious faith which is adopted in order to deal with the concept, regardless of or perhaps because of the difficulties in finding evidence for its operations and effects. This is not surprising as new technologies have a long history of exposure to and expression in terms of religious discourse (see Campbell & La Pastina, 2010). It is also related to the persistent concerns with both the threat and promise of new media. Religious discourse is most strongly associated with the issues of power and control that arise with technology use (see Ellul, 1964). Variations on the spiritual theme include Stahl's (1999) "technological mysticism" which frames technology as magic, while Davis' (1998) "techgnosis" emphasises the "mythical and mystical qualities" of technology as "a god to be worshipped" (see Campbell & La Pastina, 2010). There is also evidence that religious discourses around technology are easily incorporated into popular discourses, for example with the 'cult' of Apple (ibid).

The tone of some of the literature on interactivity suggests it is simply an article of faith for believers, for example in representations from the fields of hypertext theory or games studies. Others such as CMC and information studies perspectives have doubts and are in search of proof and definition. Meanwhile the sceptics, from a range of perspectives including cultural theory to the political economy theorists of media and communications, consistently cite lack of convincing evidence but focus particularly on challenging ideologies especially those

emanating from commercial and political arenas. The flexibility of religious discourse and framing suits both believers and deniers, but has also been shown to hold utility for advertising and news media (ibid). This study will analyse whether religious framing passes through to public discourses around interactivity and how such discourses impact on its understanding and operation.

3.4 Labelling interactivity: it's all in the name

Interactive TV and interactive whiteboards represent the power of the adjective. The description originates in the function, but the label appears to carry further transformative qualities for the 'machine' in the contexts, behaviours, meanings and outcomes implied in its use. The 'interactive' in a museum or gallery also gets its name from its function – it is interactive, therefore it is 'an interactive' – without any need for a machine to be attached. This is an example of a 'zero derivation' in grammatical terms or a 'deverbal' noun. Indeed, the label grows to describe entire institutions such as the 'interactive science museum', now a regular feature of cities all over the world (see Gregory & Miller, 2000)

Research studies on these and other entities labelled interactive tend to 'reverb' and ask what interactivity is, or what makes the machine/experience/institution so different from its (presumed) non-interactive predecessor. Furthermore, they ask if earlier versions deserve to be described as not interactive. As such, interactive labelling brings commercial and ideological forces into play which trigger much of the critique, hype and scepticism found in the literature.

The effect of deverbing and reverbing is that comparative measures and qualitative assessment are the focus of discussion, rather than analysis of interactivity itself and its own particular features and outcomes. This can be seen in the literature where face-to-face interaction is the normative standard to which mediated social interaction must measure up, instead of assessing its facility to produce outcomes not possible with face-to-face interaction. Similarly, IWBs tend to be assessed in terms of teacher/student communications and general appeal, and are compared to traditional pedagogical structures, rather than measuring the specific educational outcomes of IWB use in the classroom for students. Meanwhile, discourses around interactive science museums focus on the potentially homogenising effect of interactivity on exhibition and museum design, relegating the adjective to a mere branding exercise while invoking the myth of newness – after all, science museums have always been interactive (see Hughes, 2001, Lunenfeld 2009).

The literature makes reference to the influence of key players (market, regulatory and political) in the labelling discourses – whether IWB manufactureres, cable and satellite TV companies, ICT industry representatives, public policy makers and public representatives. Their interests range far beyond the specific instances of a single communicative event and so

the labelling power of interactivity becomes associated with wider pedagogical discourses (constructivism, the benefits of science to society and so on), ideological discourses (the information society) and socio-political discourses (citizen empowerment, futurism tropes). These trends in the discourses found in the literature suggest that a thematic approach is the most appropriate to analysing public discourses.

3.5 The age of interactivity – going public

Tehranian (1995) proposes five operational models to explain communications in relation to social change, represented on an evolutionary scale by the Supernatural, Mechanical, Organic, Cybernetic and Linguistic ages. A cursory mapping of the literature on interactivity onto this structure shows that it has not followed such a simple linear evolutionary or developmental route. We appear to be experiencing all five ages at the same time – the age of interactivity.

This review has attempted to provide something of a picture of the volume of research into interactivity, the variety of perspectives of influence, the validity or otherwise of positions taken on it and the variance in emphasis on observed elements. The discourses in the literature have been revealed. Their persistence adds to its value, even its mythic character. But what has also emerged is a sense that discourse may be both the problem and the solution. Recent studies suggest that people have preconceived ideas about interactivity, which may impact on their perceptions of it in operation (Quiring, 2009). While interactivity as a concept is fraught it is useful because it is so "engrained a part of the parlance" in gaming (Newman, 2002) but equally in a wide variety of other communication contexts. User and producer 'frames of reference' may influence what people mean when they talk about interactivity, and discourse analysis is a useful research tool in this regard (KB Jensen, 2005).

The challenge now is to assess which of these discourses have found their way into the public domain, which are dominant, which are in conflict and what impact might they have, not only on its understanding in operation but on its design and implementation in communication events.

CHAPTER 4
Theoretical and conceptual framework

The literature on interactivity contains a wide variety of perspectives from many academic fields in both the sciences and humanities. Interactivity is considered virtually meaningless and part of new media hyperbole at one end of the spectrum while regarded as a core element of communication embodied in today's most important media experiences at the other. This study is concerned with whether these or other perspectives are circulating in public discourses and how public discourses themselves might impact on the understanding of interactivity.

This chapter outlines the framework for this research detailing why interactivity is important and what this study aims to add to the existing body of knowledge on it. First, the theoretical approach to the study is described, dealing with the problematisation of interactivity and the deconstructionist approach taken to it. Next a discourse analysis framework is outlined which draws from a number of perspectives including critical discourse analysis (CDA) and discourse theory analysis (DTA). The concepts of 'discourse communities' and 'boundary object' are also introduced which will be used to reflect on the impact of discourses around interactivity. Finally, the research questions and thematic approach to the discourse analysis are laid out, along with the benefits of a comprehensive interdisciplinary research framework.

4.1 The problem with interactivity in theory – deconstructing discourses
The study of interactivity has generated multiple definitions, conflicting theories and a lack of certainty over its operation and role in communications. This indicates a 'problematisation' of interactivity (after Foucault, 1984) which could benefit from discourse analysis. This approach is not concerned with finding one valid solution from all the possible definitions in existence, but identifies the "acts, practices and thoughts" that pose the problem for interactivity – which in this case is the discourse around it (ibid). Despite the volume of research and the detailed and valuable analysis that has been carried out, the discourses around interactivity have failed to fully explain it, reflecting in some respects the limits of discourse in its ability to represent the world (after Derrida, 1981, cf. Howarth, 2000). Each revised context in which discourses arise around interactivity, each interactive communication, generates further different meanings which in combination create something like Derrida's (1981) 'play of differences' which mediate our understanding of the concept. This study is not a deconstruction of discourses around interactivity according to the 'marching order' of Derrida although some related concepts are useful in problematising interactivity (Howarth, 2000). For example the literature review shows how discourses emerge from the structures of academic discipline as well as the contextual, social and

political structures of technology and media and their uses. This thesis is informed by a deconstructionist approach which targets these structures (see Howarth, 2000). Another target of the deconstructionist approach which has been observed in the academic discourses on interactivity is the tendency to presume both historical continuity of the concept and historical 'ruptures' in theory. This thesis focuses on continuities and ruptures in discourse rather than the concept. The gaps, collisions and questions that arise in the literature review shows that overall the discourses are neither united nor coherent and are therefore potentially open to deconstruction. However, as its critics have noted, deconstruction has little purpose if it merely reduces all discourse to the play of signs and text (see Howarth, 2000). Discourse analysis must address issues 'beyond the text' which are affected by the circulation of ideas (ibid). The deconstructionist outlook is merely useful for understanding disciplinary, political and social relationships which are influential in pushing some discourses to the fore and others to the margins, which this study will attempt to reveal.

4.2 The problem with interactivity in practice – deconstructing discourses

At a micro level, interactivity could be the fulcrum in communicative events upon which encoding and decoding efforts appear to pivot and through which both understanding and strategic benefit might be achieved. At a macro level interactivity may operate as a prism through which wider social and political discourses are stratified, and through which further media and communication concepts and theories can be brought into focus. But at a practical level, the focus of many media and communications professionals is on designing and building with and for interactivity. Other interest groups commission specialists to design and build interactive communication events for their own communicative (or other) purposes. One of the concerns of this study is the effect of such a variety of competing discourses around interactivity on outcomes in practice.

The meaning of interactivity is important in the design and development of media and communication artefacts of which interactivity is an integral part (see Hughes, 2000, Lister et al, 2003 etc). But responsibility for interactivity centres on how this interactivity is defined. It may be understood as: a) a characteristic of the medium, where responsibility is to some extent outside the control of the participants and lies in technological production; b) an application or function of design of that medium, where it is the responsibility of the interface designer or multimedia author, who is again outside the immediate event but designs all possible events in a closed loop; c) a perception of users or a feature of context, where all participants and actors must agree on its operation in a similar way and take responsibility accordingly; d) a combination of these and other definitions, where responsibility sits with all who contribute to its design and use.

The effect of these different definitions operating in competing discourses may impact upon the perceived success or otherwise of the interactive event. Definitions of interactivity such as these will be addressed in more detail in the literature review, and will be revisited throughout the thesis.

This research topic was partially inspired by the author's personal experience of the digital media industry, during and after the series of dot com 'mini-booms and busts' in Ireland[10]. When building web or mobile applications or venue based installations, and whether for commercial, cultural, educational or public service communication purposes, the question of interactivity inevitably arises during the digital media production cycle, causing debate and some division within production teams and with clients. Questions such as "How interactive should it be?", "What do you mean by interactive?", "What is interactivity?" arise frequently, highlighting the lack of general consensus on the concept. These questions also point to the need for "conventions and principles" on interactivity, to get beyond the "wow factor and 'I know it when I see it'" approach prevalent in digital media and games design (see Polaine, 2005).

Within the digital media process, the answers to these questions frequently depend on the project specifications and the area of an individual's responsibility within the production cycle. However, training and experience which is subject to academic, professional and public discourse around interactivity, is also highly relevant. The area of expertise could be interface (or 'interactive') design, software development or authoring or indeed the many other creative and non-technical areas of knowledge that contribute to digital media development but are not emphasised as often as the technological skills (see Preston et al, 2009). Each of these fields is informed by the relevant perspectives already outlined in the review and by the complementary field of literature aimed at the digital media professional (for example Hughes, 2000, Laurel & Lunenfeld, 2003, Barfeld, 2004). In addition, graduates of the newly emerging degree programmes in multimedia in Ireland and elsewhere since the late 1990s have been exposed to a mix of these and other theoretical and professional materials along with the particular discourse emphases of 'science meets art' that these new programmes were structured upon.

For example, *interface designers* tend to come under the influence of graphic design, aesthetic and film theory, cognitive psychology, HCI and AI perspectives and so on. Indeed, the design of the 'user model' and feedback that supports it, is described as one of the key stages in 'interaction design' coming under the influence primarily of cognitive psychology (see Barfeld, 2004). Interactivity is regarded as the 'art' of 'creating 'compelling experiences' for users (see Shedroff, 1999).

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[10] Rather than the 'dot.com boom and bust' which described the digital media industry from roughly 1999 to 2002 elsewhere, Cawley (2003) describes this period in Ireland as "closer to Schumpeter's waves theory of mini booms and busts, growths and contractions" and typical of an innovation sector yet to achieve maturity.

Meanwhile, information and instructional design techniques inform *content developers* and *information architects* who shape the content in such a way as to balance the designer's (interactive) vision with the creative or commercial ends required by the project. Interactivity between user, data and machine is judged within accepted standards of 'usability' for the context (see Nielsen 1997, Rosenfeld & Morville 2002).

The technical requirements of software development, database design, multimedia authoring and programming may restrict utopian design visions, making the *programmers* act as gatekeeper to the possible and practicable, within the constraints of the project, the development time allowed, testing practice available and the physical technological context. On the other hand, *'middleware' developers* help to realise the immersive and virtual reality features required to achieve more ambitious immersive interactive design visions. The *project managers* meanwhile, walk a fine line between the 'front end' and the 'back end', managing the implementation of 'interactivity' between both as well as between machine, data, system, others and user and possibly multiple users and hosts/clients. Finally, the *client* view of interactivity depends mostly on their communicative strategies and goals with many still viewing digital media as a 'persuasion' tool rather than a 'communication' tool (see Stewart & Pavlou, 2002). Public discourses are likely to be of particular influence to them along with other perspectives from their own particular field of practice.

4.3 The practical value of interactivity – deconstructing discourses

The mix of contested and overlapping discourses surrounding the issue of interactivity that emerges during the digital media production cycle, provides for rich debate and often challenging design concepts, but also has the potential to derail a project. Designing and producing interactivity in digital media is complex enough when there are multiple contested ideas on interactivity in circulation *inside* the production space. What of the impact of discourses from *outside*? This is the point where this study makes its entrance, to address the discourses around interactivity as they are played out in public. These public discourses are important because they reflect the continuing negotiations between academic theory and professional practice which take place in the public space, even the public sphere. But they also have potential for reflexive influence back into the production space, adding to a rich source of empirical data where future research could focus on how interactivity is understood and operationalised in practice.

In his investigation into interactivity "in the wild", (meaning in real world applications) KB Jensen (2005) called for research into the circulation of ideas about interactivity precisely because of its practical value:

> "…different notions of interactivity may be passed back and forth, and negotiated, between discourses of marketing, public debate and practical design…[for example] the cyberspace metaphor appeared to fundamentally affect not only literary but also technical and design discourse of the 1980s." (KB Jensen 2005:p.11)

Another reason that the meaning of interactivity matters is because it is considered to have value in media and communications, in terms of its impact on 'effectiveness' and information retention (see Heeter, 1989, Koolstra & Bos, 2009). Concerns over potentially negative effects of 'too much interactivity' (for example Sundar 2004) only further support the argument that clarification over its meaning and operation would be beneficial for production. The literature review has shown a number of studies aiming to define interactivity, which begin with the assumption that it is a feature of a particular communication scenario, domain or technology. Such studies construct experiments involving this context and variations are observed, data recorded and findings produced. The results are based on a narrow and biased set of criteria, for example that a person and a computer are participants or that the purpose of the communication is to extract information or that the communication is carried out in private. The resulting definitions, though valid and important in themselves, are difficult to apply outside the research context and tend to have little practical value in the digital production context. Further studies attempt to devise instruments of measurement of interactivity that are useful for the interactive communication itself (for example Koolstra & Bos, 2009). Even if the results are useful, this is measurement after the effect which is too late for application during the design and production of the interactive communication itself. In practice, the measures used within the professional design process tend to follow Laurel's (1993) very "rudimentary measure of interactivity":

> "...you either feel yourself to be participating in the ongoing action of the representation or you don't" (Laurel, 1993:p.20-21)

Laurel's thesis, though wholly subjective, is highly influential in the digital media profession and cited frequently in multimedia design textbooks (for example Hughes, 2000, Barfeld, 2004). Interactivity as a combination of the 'procedural' (meaning the computing process) and the 'participatory', and the part that perception and agency also play in the concept, certainly informs a large element of HCI and game design to this day. However, like users, digital media professionals have their own preconceptions and expectations of interactivity from both their personal media experiences and also public discourses. So while Laurel's test might work during the design process, there is no guarantee it would satisfy what Hughes (2000) describes as the 'unknown audience'. The proliferation of wireless platforms and the move towards ubiquitous computing makes a traditional HCI measure of interactivity increasingly anachronistic as traditional WIMP (windows, icons, menus, pointers) interfaces

disappear. A clearer understanding of the role of interactivity is becoming more urgently required.

The digital media industry is by its nature becoming context independent or 'platform neutral'. Standard applications such as websites or console games are designed and built through processes that maintain, as much as possible, the separation of content from 'container' (embodied literally and metaphorically by Doctorow, 2008). Indeed there are entire sectors of industry (and society) focused only on producing content and others who specialise purely in the containers. This future-proofs content against platform obsolescence and also allows maximimum potential publication and distribution opportunities, because of the discrete and independent nature of digital data (see Manovich, 2001).

The output of digital media production is not just websites, mobile applications, games and the many other commercial cross-platform examples suggested here. As noted in the literature review, interactivity is a feature of museum and exhbition design, advertising and marketing communication, artistic exhibition and output, literary and narrative design, government and public service communication, broadcasting, political and civic communication and of course online social networking. In each interactivity can be seen as a bridge between content, container and user. Understanding how interactivity works is important for those concerned with producing content and containers, but so also is an understanding of how, where and why the content and containers are used. Therefore the characteristics, the context, the applications and the perceptions all feed into the understanding of interactivity in the digital media production process. The value of interactivity is in its ability to transcend the limits of any one of these features of communication but this in effect generates its multifaceted nature and the contested discourses around it. The challenge is to find a way to address these different discourses together and to ascertain where they arise and carry force and their potential impact on the understanding of interactivity.

When a concept is constantly subjected to revision of its definition and questions over its existence and persistent attempts at definition fail to muster the support necessary to move theory on, one must ask if the approaches taken are problematic to begin with. A deconstructionist approach helps to unmask the frameworks within which the concept has developed. Discourse analysis aims to switch the focus from definitions and measurements to the bigger conversations in circulation which may influence its reception and implementation. Finally, there is a reflexive effect back on specific articulations of interactive communication, which are themselves constituents of discourse, and which may be subjected to discourse analysis. For example, if academic research is to be conducted on communication events such as comment threads on online news sites, political facebook profile posts or twitter feeds, an understanding of the potential for conflicting discourses among participants, media professionals or academics on the meaning of interactivity is, at the very least, useful.

4.4 The methodological value of discourse analysis

Discourses on interactivity are not just talk. They also attach recognition of interactivity to specific contexts of communication and assign responsibility for its potential and actuation to specific actors or participants. Crucially, some discourses on interactivity have the effect of prejudging or evaluating the strategic outcome of an interactive communication event.

The goal of this research is not a critique of the accepted understanding of interactivity or a search for 'truth' but a widening of the discussion towards better understanding, which is a common goal in a 'combined' approach to discourse analysis (see Jorgensen & Phillips, 2002). It is not a 'for' or 'against' analysis of interactivity but an examination of the different 'threads' which construct it (ibid). The knowledge produced in the public discourse on interactivity is of course both situated and political in many respects, but it also has scientific value in relation to analysis. It provides actual evidence of ways in which interactivity is used, talked about and understood that have not been found heretofore in the traditional research methods used in interactivity studies, such as laboratory experiment, participant observation or theoretical explication. This analysis points to where discourses originating either in academic studies, popular literature or in public policy development have filtered through to public discourse in the media and form a background structure or context against which interactivity is negotiated.

This research draws on the combined approach to empirical discourse analysis described by Jorgensen & Phillips (2002) but also aspects of two specific theoretical and methodological approaches to discourse analysis – critical discourse analysis (CDA) and discourse theoretical analysis (DTA). It follows a critical discourse analysis method of inquiry into the 'order of discourse' in the data under analysis. This refers to the semiotic 'construal' of an issue as formed by "networks of social practices which constitute fields, institutions, organisations" (Fairclough, 2009). Fairclough prefers the word 'construal' to representation in that it implies a more active and difficult process of 'grasping' of the world (or an issue) from a particular perspective, than the more stable process implied by representation. In practice, this means attempting to trace the origins of a construal that appears in discourse, through cited references, documents, organisations and so on. It echoes Foucault's (1968) 'order of discourse', an archaeology or geneaology of production of knowledge, with its particular emphasis on issues of power, empowerment and disempowerment (see Gutting, 2005). Discourse is about the fixation of meaning within a particular domain. But order of discourse allows for different discourses that compete within the same domain to be used to highlight how meaning is constructed. In this research, the social discourse of print media will serve as the central domain (which is discussed further in the Methodology). This is where the analyses of the different discourses circulating will take place, such as the dominant discourses from media and communications theory or the competing discourses from

education and arts and culture disciplines and the common ground on which all discourses concur. The common ground accentuates the stability of some aspects of meaning while competition between discourses shows how and where they are open to change. Change occurs especially when discourses are transported interdiscursively *between* orders of discourse (Fairclough 2009).

CDA has a special emphasis in its research agenda on the use of language in relation to certain political issues which have relevance to this study, such as:

> "analysing, understanding and explaining the impact of the 'Knowledge-Based Economy' on various domains of our societies: related to this, the recontextualisation of KBE into other parts of the world and other societies" (Wodak & Meyer 2009)

This idea of 'recontextualisation' is a useful tool in the analysis of discourses around concepts such as the 'information society', where interactivity has been used or invoked. However, overall this study is not a formal CDA of interactivity, which is a methodology better suited to political issues such as racism and generally aims at revealing hidden power relations and producing results for practical application (see Carpentier & deCleen 2007, Wodak & Meyer, 2009).

Discourse theoretical analysis on the other hand takes a more macro-textual approach, seeing text as the materialisation of meaning and/or ideology (after Barthes, 1975, cf. Carpentier & deCleen, 2007). DTA goes beyond the specific language and context of the particular discourse being analysed, to the wider actions and objects associated with it and is defined as "discourse-as-representation" (Carpentier & deCleen, 2007:p.277). This post-structuralist style of analysis is perhaps more suited to the concept of interactivity, which could be seen as a kind of 'floating signifier' (after Levi-Strauss) with so many discourses circulating around it, it is difficult to find closure on it (Howarth 2000). The literature however has provided some 'nodal points' where discourse appears at least partially fixed, making some meaning possible (Laclau & Mouffe, 1985).

> "DTA becomes especially valuable for analyses that are aimed at deconstructing the complex relationships between representations, practices and identities, and the way they contribute to the generation of (old and new) meanings" (Carpentier & deCleen, 2007:p.278).

Where the nodal points and discourses obtain dominance, there may emerge a hegemonic practice which brings together different identities into a common project, stabilising them into consensus over meaning (Howarth, 1998 cf. Carpentier & deCleen, 2007). But because the discourse occurs in an open system, these hegemonic meanings also have antagonisms or opposites, which on the one hand attempt to destabilise their meaning but on the other are required as an 'other' to reinforce those meanings (ibid). This is a useful approach to take to

the concept of interactivity where the literature suggests some hegemonic practices for which interactivity is an 'empowering' feature of new media or is both a tool and measurement of the information society. It also allows for analysis of antagonistic meanings which question such ideologies such as the sceptical perspectives in the literature.

4.5 Discourse communities and boundary objects

Most discourse analysis perspectives highlight the issue that texts are not neutral. For example in CDA, where the focus is on power, and where the texts analysed are frequently print media, it is regarded as 'very rare that a text is the work of only one person' (Wodak & Meyer, 2009). Texts are 'sites of struggle' that show traces of differing discourses and ideologies competing for dominance. Discursive differences are governed by differences in power that are in part encoded in and determined by discourse and by genre. Discourse analysis therefore is useful in breaking down these differences and assessing their impact:

> "By identifying the relationship between the discourses within a certain domain, [discourse analysis] can explicate why people draw on some discourses rather than others in specific situations" (Jorgensen & Phillips, 2002)

This study will focus on particular groups which contribute to the public discourses under analysis and may be influential in pushing some discourses to the fore. The concept of 'discourse community' is a useful tool in identifying groups in the public discourse who are associated with certain perspectives, themes or 'construals' of interactivity that emerge. Discourse communities are broader than groups defined by academic disciplines and are an influential concept in the fields of rhetoric and composition studies (see Porter, 1986, Freed & Broadhead 1987). According to Swales (1990), discourse communities are defined by their "common goals, participatory mechanisms, information exchanges, community specific genres, a highly specialized terminology and a high general level of expertise" (1990:29). The specialised language of discourse communities will be of particular focus in this study. This reflects a social tendency to tailor language use perhaps towards an intended audience in anticipation of preferred responses. But it is also frequently used to enhance both membership of and exclusion from cultural groups, resulting in the production of 'dialects' such as "Medical School English…or Twelve-Year-Old-Males-Whose-Worldview-Is-Deeply-Informed-By-South-Park English" (see Wallace, 2005).

Of particular interest to this study are what Bizzell (1992) calls the "the value contradictions that arise when discourse communities overlap" (ibid:p224). Through these we can find out whether a discourse community has the power to constitute a world view over a whole communication context, in this case in relation to the meaning of interactivity. By identifying and examining the discourse communities operating behind and within the texts, this study

will examine the strategic interests that may be in play whether from a political or commercial outlook or a particular theoretical perspective or indeed whether groups mix discursive themes for specific communicative purposes.

According to Swales (1990) some individuals or groups hold membership of different discourse communities at once. He singles out both prospective sons-in-law and "skilled professional journalists with their chameleon-like ability to assume temporary membership of a wide ranger of discourse communities" in order to explore how such multiple membership is used to achieve specific communicative ends (ibid:p.30). This study will focus on the role of journalists as members of their own but also other discourse communities for the role they play both in circulating discourses and in presenting particular 'construals' of interactivity. Of further interest are the discourse communities engaged in the kind of 'technicist' commentary that has been observed in more hyperbolic discourses on technology (see Winston, 1998, 2007) which could include journalists but also others. This is essentially a technologically determinist view where technology is seen to 'emerge' from research and experiment and change the society into which it emerges (see Rogers, 1986, also Williams, 1989). The analysis will investigate where this view sits in the public discourses, but also whether interactivity is implicated in such change, as a 'characteristic of the technology', as it has been described in the literature.

Alternatively, interactivity may be viewed within the social construction of technology (SCOT) perspective whereby, as a feature of the context of communication or the perception of users (or a combination of elements), it is part of how technology is slowly shaped over time through both use and technical development (Bijker, 1995, Winston, 1998). The discourse analysis will also examine where both technological determinism and SCOT perspectives – and those in between – emerge in discussions on interactivity. However, the lack of consensus over interactivity suggests that it has not yet reached the kind of 'closure' or 'stabilisation' required for a definitive assessment of its place in society as driver of change, sociologically shaped or both (see Bijker, 1995).

This study aims to contribute to the study of interactivity by focusing, as Bijker proposes, on the problems 'as seen by various social groups' in order to avoid a simple linear or evolutionary theory of interactivity in society (ibid:50). These groups, whether academic disciplines, digital media practitioners, users or discourse communities, are extremely diverse with a broad range of interests, visions, goals and reasons for their interest in interactivity. The danger in discourse analysis is that it may just replicate what has been found in the literature and produce no more than a series of different opinions from different groups. This thesis proposes a solution which is to utilise the concept of interactivity as a 'boundary object'. This serves to draw connections between groups shown to have a common goal in some discourses around interactivity, while also highlighting those value contradictions that

emerge from overlapping discourse communities. In this way, the analysis uses discourse communities to explore discourses around the research object, but also uses the object to reflect back on the interplay between discourse communities and the discourses they produce. Boundary objects have been used to draw diverse communities together around a shared common goal, for example in the science community:

> "Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual- site use. These objects may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds" (see Star & Greisemer, 1989:p.)

Boundary objects can be classified as different types according to the uses to which they are put such as ideal, standardised or other forms. The analysis will investigate if interactivity can be used as a particular kind of boundary object, in order to draw communities together, to distinguish communities from each other, or to achieve other communicative or strategic goals.

4.6 Specific research questions & thematic approach

Four major research questions form the core of this study, which are:

1) What are the different meanings of interactivity in circulation in public discourse?

2) How do these discourses compare with the academic literature on interactivity?

3) What are the dominant and marginal themes in the public discourses around interactivity or what conflicts, agreements or overlaps can be observed?

4) What discourse communities can be observed in the discourses?

These reflect a comprehensive interdisciplinary approach which is *purposeful,* in having a goal of understanding, is *disciplined* in incorporating disciplinary methodologies and modes of thinking, and *integrative* in that it mixes disciplinary approaches towards their added value in creating understanding (Boix-Mansilla, 2006)

In order to address these questions, a thematic discourse analysis approach is used which identifies a number of themes of interactivity in the literature and allows for further themes to be added as they arise from the data itself. This reflects the possibility that the literature does not reflect the total universe of potential discourses and acknowledges that public discourses may also not exhaust the possibility of further themes. Themes are neither frames nor definitions but reflect representations or 'construals' which form a step in a process towards

the stabilisation of the concept of interactivity. The following themes will initially guide the analysis of public discourse:

- *Empowerment theme*: Interactivity empowers participants in communicative events, possibly transforming and transcending typical sender/receiver relationships
- *Pedagogical theme*: Interactivity improves learning and is essential to digital education tools
- *Ludological theme*: Interactivity is related to game playing, it adds to fun
- *Information Society theme*: Interactivity emerged with the Information Society and is evidence of and central to the existence of such
- *Sceptical theme*: Interactivity is meaningless nonsense, hype, hyperbole
- *Aesthetic theme*: Interactivity is a subconscious aesthetic, even esoteric, sensation

The analysis of these and other themes which arise, along with the overlaps and conflicts between themes, will also be used to address two further research questions:

5) What role does the museum or exhibition context play in discourses around interactivity? This question is based on the hypothesis that this context is associated with more of the themes of interactivity than any other media and communications context. It seeks to build on Silverstone's (1991) contention that because of their unique treatment of content, context and concepts like interactivity, museum and exhibition contexts, largely neglected by media and communication studies (still to date), should be considered for research purposes as media.

6) How does consideration of interactivity as a 'boundary object' benefit media and communications studies and how does this impact on the meaning of interactivity?

This framework describes why the understanding of interactivity is important in media and communications generally but also for its practical application or implementation. It describes how a deconstructionist approach to a discourse analysis framework, will draw on perspectives from critical discourse analysis (CDA) and discourse theory analysis (DTA). Further tools and concepts such as discourse communities and the boundary object will also inform the analysis. The dominant discourses in the literature have been reorganised in terms of thematic rather than disciplinary features, in order to deconstruct the theory to date and prepare the foundations for analysis of public discourses. A thematic approach has been outlined that will be applied to the discourse analysis of public discourses on interactivity. The next step is a more detailed outline of the methodological approach to this study.

CHAPTER 5
Methodology

This chapter outlines the specific research design adopted for this study into interactivity. It begins with a review of previous research methodologies, identifying the gaps which this thesis aims to address, and then outlines the rationale for selecting content analysis and discourse analysis as the core techniques for analysis of public discourses. The process of defining the data sample is described along with the design of the codebook and the approach to discourse analysis. The strengths and weaknesses of the research design are finally addressed in advance of presenting the research findings.

5.1 Methods used in previous interactivity studies

As noted in the literature review, many studies of interactivity have aimed to develop definitions on either a multi-dimensional or typology/spectrum basis. These studies have produced valuable insights into the concept, although issues remain in terms of the practical application of definitions which arise from context specific methodologies – where context is deemed relevant to the findings. Such definitions are unsuitable for universal application, while the normative standards used in some research design (for example the ideal of 'face-to-face interaction') fails to recognise features specific to other communication events.

In terms of methodologies applied, much of the research is theoretical and has concentrated on literature review, discussion or critique and/or concept explication (for example J Jensen 1998, Huhtamo 1999, Kiousis 2002, Kim & Sawhney 2002, Liu & Shrum 2002, Bucy 2004, Sundar 2004, Newhagen 2004, Stromer-Galley 2004, Holmes 2004, Richards 2006). Some studies have also included critical analysis of illustrative examples from mass media (for example Cover, 2006) while others have attempted to develop a measurement instrument for interactivity based on findings in the literature (for example Koolstra & Bos 2009). Of the fewer empirical studies carried out, almost all (to this researcher's knowledge) consist of interviews and surveys with 'users' of interactive communications. Only the frequently cited studies from CMC research (for example Rafaeli, 1988, Rafaeli & Sudweeks, 1997) use a different methodology where actual messages from bulletin board and other networked group communications are analysed – the "real artefacts of a new kind of communication" (see Rafaeli & Sudweeks, 1997). However, while the data in these studies is textual, the methodology does not involve linguistic analysis, but focuses on the 'interrelatedness of messages'. In other words, interactivity is both a data measurement tool as well as a finding. The researchers themselves acknowledge that the findings although useful, are far from a theory of interactivity (ibid).

Of the user-focused methodologies in the literature, some involve structured interviews independent of communication context, with experts or 'elites' (for example Downes & McMcMillan 2000) or 'ordinary' users (Quiring, 2009) or both (KB Jensen 2005). But many studies into interactivity are based on surveys of users during or 'post-use', particularly with regard to websites with specific types of content. These studies include surveys of both users and content managers of health web sites (McMillan 1998, McMillan 2002), users of news journalism websites (Schultz 2000, Hujanen & Pietik'ainen 2004, Larsson 2011) and users of online science materials (Massey & Levy, 1999, Macedo-Rouet et al, 2003). Other studies have conducted similar surveys online (for example Sohn & Lee 2005). Further specific fields of content that have been analysed include advertising and science museums, the latter reflecting the only qualitative data found in the literature not gathered from internet use but from offline standalone kiosk use (Heath et al, 2005).

From a methodological point of view, the literature appears to be narrowly representative of the potential of this communication concept. Further limitations can be observed in the size of data samples. For example, the numbers recruited for these studies are generally low with the largest number of survey participants found at 108 for the online survey (by Sohn & Lee 2005)[11]. The other studies cited produced results from less than fifty surveyed users and several of these studies used journalism and communications students as respondents (for example McMillan 2002, Macedo-Rouet et al, 2003). Although these exploratory studies are useful, this style of survey recruitment raises questions about the representativeness of survey respondents but also about the preconceptions student participants may have about the object of research, having been already exposed to communications theory.

Finally, respondents in a number of studies were given a series of pre-defined 'dimensions of interactivity' or Likert-scale style questions in order to record their experience and perceptions of interactivity and so on. Similarly, the structured interviews carried out tend to involve questions about interactivity which included assumptions about the context, technologies or participants involved. Both techniques tend to produce results with a certain bias in terms of definition of the concept or context within which interactivity is understood to occur (e.g. with a computer).

To this author's knowledge there are no published studies of public discourses on the concept of interactivity, nor content analyses of media coverage relating to the topic nor any studies that look at the concept over a longer time frame than approximately one year (relating to collection of surveys, interviews or message analysis). This study aims to address the concept from this relatively unexplored angle. It attempts to gather a wider range of perspectives than

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[11] However, this represented only 4% of the total number invited to the call, reflecting the declining rates of online survey participation rates generally, as noted in the study. This indicates that the methodology may not be particularly representative nor likely to generate useful results in future.

is usually found, taking in a broader variety of nondirected specific and generic contexts across a longer time frame, and from a different kind of data set.

5.2 Methodological design for this study

In order to facilitate analysis of the largest possible data range and also to address the noted methodological gap in studies to date, content analysis was chosen as the approach best suited to address the research questions. Content analysis is a reliable and replicable quantitative research technique with a long history of application with media content (see Krippendorff, 2004). This quantitative technique produces scientifically valid results for quantifying phenomena as they appear in media representations, and although not restricted to textual content, is highly suited to it. Newspapers were selected as the medium of choice for gathering data on public discourses because they are seen to represent the constitutive effect of discourse, having the power to establish what becomes discourse, through their widely disseminated content to a large audience (see Mautner, 2008). While broadcast media serve a similar function, there are practical constraints on gathering a similarly large volume of data in analysable form. The availability of newspaper data in digital form from databases such as LexisNexis, means that a much wider data sample may be gathered than from the the manual real time search formats required for other media content.

This research takes the form of a textual analysis or 'media linguistic analysis' (see Deacon et al, 2007). This entails analysis of data in terms of its meaning production, but also in terms of relations of power and knowledge, inasmuch as these can be observed (ibid). Krippendorff's (2004) definition of content analysis acknowledges that meaning within texts is relative to the contexts and discourses associated with them. Therefore, the research approach adopted by this project integrates two stages of analysis: the quantitative technique of content analysis combined with the qualitative approach of discourse analysis, towards addressing the meanings circulating around interactivity.

Content analysis is regarded as an appropriate methodology for quantifying the salient and manifest features of a large number of texts where the statistics will be used to make broader inferences about the 'processes' and 'politics' of representation (Deacon et al, 2007). However it not completely value free, as any process that involves subjective coding of data is open to interpretive influences. Choices made during the process in relation to sample, measurement, coding and statistical analysis as well as clarity in relation to methodological decisions on all of these points, are crucial to achieving and maintaining rigour in such quantitative assessment exercises (Lacy & Riffe 1993).

For this longitudinal study content analysis was considered the optimal choice for measuring and describing the general features of coverage of interactivity over fifteen years. This material would be used to explore and analyse the variety in definition or interpretation of the

topic. The 'processes' of representation analysed would include the communication contexts referred to as well as the language around the concept, for example technical descriptions to 'buzzword' uses along with shifts in use or genres of discussion. The 'politics' of representation analysed would relate to the connections made to outside discourses, other geographic contexts, quotes and citations, author trends or influences from other discourses such as public policy, and discourse communities which may be found in the coverage. Although it is a quantitative research tool, the content analysis informs and provides the basis for validity for the second stage of analysis – a qualitative discourse analysis of the thematic representations or 'construals' of interactivity that emerge. As noted previously, discourse analysis is particularly suited to this research topic for a variety of reasons but especially in providing actual evidence of ways in which interactivity is used, talked about and understood that have not been found heretofore in the traditional research methods used in interactivity studies. The analysis aims to highlight where discourses originating either in academic studies, popular literature or in public policy development have filtered through to public discourse in the media and form a background context against which interactivity is discussed. It also aims to reveal differences between public discourses and the literature, whether the absence of discourses or the presence of new ones.

The discourse analysis is based on the quantitative analysis of themes arising from the coverage and focuses on key articles over the time frame to illustrate these themes. An intertextual analysis of these articles and the sample data in general identifies further fields of discourse (academic, public policy, political) used for a broader analysis of the influences, or order of discourse, from which such themes or 'construals' of interactivity may emerge. These two separate though inter-related stages of newspaper analysis are employed in complementary and mutually reinforcing ways. The combination allows for a broad longitudinal study with the benefit of focused contextual analysis at key points along the timeframe. This ensures that the results are both descriptive and proportional at a macro level over time, while providing the detail required for a comparative intertextual discourse analysis. The limitations and challenges of this methodology are addressed further in this chapter, but first, a more detailed overview of the research design is presented.

5.3 Content Analysis – data, pilot study and sample

The content analysis examined fifteen years worth of newspaper coverage in Ireland. At the outset, the newspapers selected were the national broadsheet 'elite' daily and Sunday newspapers, the *Irish Times,* the *Irish Independent*, the *Sunday Times, Sunday Tribune, Sunday Independent* and *Sunday Business Post.* The criteria for selection were circulation, readership, class of reader and reach to and impact on policy makers. Elite newspaper influence is not exclusively tied to the sale of their circulation but to the fact that their

readership tends to have a disproportionate number of policy and decision makers (see Entman, 2004). This issue is important to a discourse analysis where the circulation of discourses in terms of potential impact outside the public discourse is relevant.

The total population of articles for the period was estimated to be c.5000, based on a keyword search in LexisNexis for the terms 'interactivity' or 'interactive'. Database collection was chosen over manual collection as it benefits the collection of larger more representative samples, it provides for quicker analysis and helps in finding rare content which might be overlooked in the manual process (see Tankard, Hendrickson and Lee 1994). However, there are disadvantages also in that the total universe is not always clear, searches can return irrelevant content and some contextual information is omitted such as images and page position (ibid, see also Riffe, Lacy and Fico, 2005). In this case, the focus of analysis was on the discourses within articles and so a decision was made that contextual information would not be essential for analysis. Also, the limitations were addressed in that the research did not aim to provide correlations with or prove causation for independent variables, and care was taken not to produce overgeneralisations from results. The purpose of the content analysis was descriptive and to provide validity for the material selected for discourse analysis.

a) Sample period: 1995 – 2009

A long time frame was selected in order to address the lack of longitudinal data in the literature to date. It also facilitates direct comparison with discourses circulating in academic or public policy arenas over time. But it was chosen particularly because it was expected that the quality of data may be inconsistent over time and may generate mixed material for detailed discourse analysis. Finally, a fifteen-year time frame would allow for analysis of shifts in discourse emphases over time as well as providing for more universally applicable findings not tied to specific contexts and/or developments in technology.

The fifteen year time period for this study covers the 'birth' of the world wide web, its growth as a retail and commercial industry as well as the emergence of related IT, software and games industry internationally and in Ireland, the dot com boom and busts, and the complementary multimedia and digital design and production industry which developed alongside. Yet these stories represent only the technology background against which a concept like interactivity arises. Fifteen years is also a long time in political life, policy development, arts and cultural pursuits, film and television creative output, educational development and the many other areas in which interactivity has played a major or minor role.

This contextual background generated a myriad of stories with references to interactivity, of interest to general readers as well as specific interest groups. In order to illustrate why 1995 is both a significant and appropriate year in which to begin the analysis, a number of

developments in technology, culture, media and communications help contextualise the period. For example, 1995 saw the release of the first commercial browser, Netscape Navigator as well as Microsoft Windows 95, both targeted specifically at the domestic market. Popular literature releases on digital technologies appeared on best seller lists such as *The Road Ahead* (Gates 1995) and *Being Digital (*Negroponte 1995). The rise of the digital gaming industry was marked with a significant release, *Johnny Mnemonic* (1995), the first simultaneous release of a film and game (on CD-ROM). It is also regarded as the first large scale use of internet marketing for a film[12]. Politically, the contextual background includes the Clinton/Gore administration in the US and its promotion of the National Information Infrastructure, or 'information superhighway' from 1995 onwards, while in Europe, the EU Information Society Policy was launched with the Bangemann Report in 1995.

A decision was then made to bring the data sample as close as possible to the present, to try and reflect the most recent developments in media, technology and culture possible. This would provide different contexts for discourses around interactivity such as the rise of user generated content (YouTube, Flickr) and social networking (MySpace, Facebook) as well as the use of mobile technologies and move away from traditional HCI contexts of interactivity.

b) Pilot Study

A pilot study was carried out to gauge the total data population, to establish an appropriate sample size and to design and test the code book of variables against which the data was to be analysed. It would also address concerns about the sample size because of the time frame being covered. The initial finding from the pilot study was that coverage was highly inconsistent. On closer inspection it appeared that some newspapers had incomplete archives, in some cases missing entire years of coverage. The *Irish Times* was the only newspaper with reliable and complete coverage for the entire sample period. It was also noted that the *Sunday Times* Irish edition was not searchable as distinct from the UK edition, which introduced problems in relation to the jurisdiction or geographical area in which discourses were being analysed. Further analysis of the data, returned for the dates where all newspapers were searchable, revealed that there was little distinguishing the coverage available from different newspapers, or more often that the *Irish Times* returned data when no other newspapers did. A decision was made at this stage in the process to reduce the number of data sources, for consistency and quality reasons, to the *Irish Times* only.

Although not the most widely read newspaper, the *Irish Times* is the 'paper of record' in Ireland and as such represents a reliable source for content analysis. As an elite newspaper, it is influential on policy and decision makers, but also records the highest readership among

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[12] In his first ever internet experience, the author William Gibson (on whose short story the film/game was based) went online to chat with users, as reported in "Crossing cyberpunk's threshold" by Amy Harmon, *LA Times*, May 24, 1995, available at http://articles.latimes.com/print/1995-05-24/business/fi-5524_1_johnny-mnemonic

the business community, considered relevant for this research[13]. While, the focus on a single title means that data from other more populist newspapers might be excluded, the decision was based on the research aim which was to conduct a longitudinal study. This requires material that is consistently and reliably available. Indeed the pilot study indicated that elite media in Ireland appeared to publish more articles making reference to interactivity than others. This may be because elite newspapers provide extensive reporting on business, media, technology and culture reflecting their predominantly ABC1 readership. Overall, the selection of a single title was considered as unlikely to interfere with generation of discourse rich material or the representativeness of such data.

The pilot study then involved the coding of three years worth of material in order to describe and measure the features of articles which made reference to interactivity. The initial selection of variables was tested in order to assess overall trends in the coverage as well as the robustness of the codebook. Full details of the codebook and variables are presented under 'Coding process' further in this chapter.

c) Constructing a random sample

A keyword search for the terms 'interactive' or 'interactivity' provided the qualifying criteria for articles included in the sample. The pilot study indicated that analysis of the complete population of coverage would not be possible for both logistical and qualitative reasons – there were too many articles with too much repetitive content. At this stage, a decision was taken to examine a random sample of newspaper coverage over the fifteen year period. A random sample needs to be large enough to be representative but also to be able to answer the research question(s) with confidence (see Krippendorf, 2004, Deacon et al, 2007). For this study, a final sample size representing one third of the total population of articles was considered manageable (c.1000). While it is still possible that it is not representative enough, this is more than five times the sample size stated to be required in the only comparable longitudinal research found (five years) in the literature on content analysis sampling (see Lacy et al, 2001).

The method chosen was a random stratified constructed sample of newspaper weeks, ensuring equal numbers of each week day in each of the months and years of the sample period. This method has been shown to be superior to and more efficient than nonconstructed random samples, in that it takes into account daily, weekly and monthly variations in newspaper content due for example to supplements or special content features or known temporal shifts in news flow (following Riffe, Aust, Lacy 1993). The total population for the *Irish Times* coverage was c.3300 articles. The sampling method produced seventeen constructed

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[13] See JNRS surveys at http://www.jnrs.ie

newspaper weeks for each year of the sample, generating 1182 articles, of which 895 in total were valid for analysis[14].

5.4 Quantitative analysis – coding process and variables

The next stage in the process was the design of the codebook to guide the content analysis. This contains a list of the 21 different variables and associated values to be analysed in each article (see Appendix for complete codebook). Descriptive variables guided the quantitative analysis to focus explicitly on the presentational and content features of coverage, while thematic variables focused on the qualitative features. The qualitative variables in the coding process involved more subjective reasoning on the part of the coder and therefore required specific rules for coding in order to keep loose interpretation to a minimum. Wherever a satisfactory interpretation could not be made in terms of the coding guidelines, for both quantitative and qualitative variables, the item was coded as 'Not specified' or 'None found' where appropriate.

Each of the variables in the codebook is briefly outlined here along with reasons for inclusion, changes or additions that were required during the process and other points of note.

a) Descriptive features, Frequency, Instance,

The unit of analysis was the individual newspaper article, each allocated a unique identifying number to facilitate accurate codification and reliable retrieval of data. Each was coded also for the date and word count of the article along with the number of references to the research subject in the article and whether the reference was specific (to a technology, event, context etc.) or generic.

b) Genre, Topic, Location

Articles were coded according to the genre or newspaper sections in which they were published e.g. News, Opinion and so on. Genre is important as it indicates the style of writing, reporting and sourcing that may be operating which may be relevant to how interactivity is presented (see Swales 1990). Genre is also audience orientated in that particular newspaper sections appeal to particular groups and possibly discourse communities (ibid). Changes in genre over time were noted[15]. For example the Computers/Technology genre moved from publication in the main paper ('Computimes') to the Business supplement

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[14] Articles declared invalid included duplicates (generated possibly by LexisNexis (LN)) as well as those returned through the keyword search which on inspection did not contain the research term. This may have occurred for a number of reasons. Some of LN's own categorisation labels for content use the descriptor 'interactive'. For example, articles on women's health issues were sometimes returned due to the LN category label 'Women's health interactive'. Articles on the broadcaster ITV in the UK were also frequently returned, as ITV is used as an acronym in LN for interactive television. Although some of these articles were valid, many were not.
[15] See codebook in Appendix A for further details on addition of Genres over sample period.

('Technology in Business') on Fridays, in mid-2002. These articles continued to be coded in the same way but the discourse analysis took the shift into account.

In terms of the stories themselves, articles were coded for up to four of 23 different topics. This is to ensure the analysis reflects the diversity of coverage as much as possible, both within individual articles and across the sample, while also allowing space for alternative interpretations on the main subject of an article. The topics give a sense of the kinds of things being talked about, the trends, the subjects, the prioirities and so on, when interactivity is used or invoked. It presents more specific detail than genre in terms of the subject areas interactivity is brought into – those that are expected, such as media and IT, but also unexpected topics like property or sport.

Location indicates what geographical places Irish media may pay attention to and, in relation to interactivity, which ones may exert influences over discourses. Articles were coded for up to three locations per article which related to the overall location being discussed (if any) and any others noted but not necessarily just the location of the interactive reference itself.

c) Domain, Venue, Configuration

These variables relate to the specific reference to interactivity. Each was coded for the domain of communication, which describes the style of communication e.g. education, entertainment and so on. This relates to the purpose of the communication context and may be useful when correlated with other variables.

Each interactive reference was then coded for venue e.g. home, workplace and so on. This refers to the physical location of the 'interactive' activity referenced (whether actual, intended, suggested etc.). Venue indicates where interactivity is actually taking or intended to take place, which may contrast with the domain already coded. It may highlight discrepancies between the style of interactivity underway and the location noted.

Configuration describes the physical or technical set up which contains, produces or assists in the interactive activity, depending on the level of detail given in the coverage, for example a web site, CD/DVD-rom, TV, Exhibit, online game and so on. Extra configurations were added over time as they emerged in the data such as 'online advertisement' or 'smartphone application'. Some configuration types were added also to cover vague or inconclusive references such as 'interactive multimedia' or 'futuristic technology'. Configuration also included 'buildings', to cover references to interactive museums or other defined spaces. Finally, 'company names' were also added as an option to this variable to cater for the proliferation of new 'interactive' media companies or spin off departments from larger companies which emerged during the sample period.

d) Mode & Definition

Mode brings the focus to the specific interactive reference itself and the participants within it, whether a communication event or some other activity. This variable attempts to describe *with what* someone or something is interacting and can be compared to the modes of interaction and interactivity outlined further in the literature review. Each article was coded for mode of communication including interactivity with machine, others, data and system (as per the review). As analysis progressed, further modes were added to cater for interactivity with space (as in virtual reality), money (as with financial instruments and tools), objects (as in museums) or 'other'.

The 'definition' variable describes the meaning of 'interactivity' which might be implied from a reading of the whole text and is based on a set of definitions found consistently in the literature on interactivity. Each article was coded as to whether the implied definition of interactivity was as 'characteristic of the medium', 'perception of user', 'context of communication' and so on. Where no implied definition was found, the variable was coded as 'none'.

e) Author, Responsible voice & Gender

Each article was coded for author, with up to six options with variations possible, including news journalist, opinion writer, letter writer and so on. The 'responsible voice' variable refers to the voice behind the reference to interactivity itself, which could be the author or a quoted individual or citation. The gender of both author and responsible voice was also coded.

f) Quotes/Citations/Assertions & Gender

Each article was coded for each of the quotes and citations it contained. The options under quotes include government representatives, ICT industry, artists, users and so on. Citations were coded according to varieties of source such as private sector, academic, popular literature and so on.

g) Qualitative variables – Relevance, "Scare Quotes"

Each article was coded as to whether the reference to interactivity was 'central', 'peripheral' or 'incidental' to the article content overall, which required interpretation of the article content[16]. The use of "scare quotes" did not require interpretation, as coding merely measured whether the research term is placed in quotation marks acknowledging undefined meaning of the term. The effect of scare quotes has been said to turn an expression meaning "X" into an expression meaning "so-called 'X'"(Haack, 2003). Scare quotes communicate a number of different attitudes to the term within – insecurity over whether the term in quotes is correct or

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[16] See Codebook in Appendix A for note on relevance measurement.

correctly used, scepticism on the part of the writer around the meaning of the term itself, or to express lack of endorsement by the writer on the use of the term by a third party quoted in the article. The overall effect however is that their use draws attention to the expression within and, according to Predelli (2003), raises both semantic and pragmatic questions for readers around the meaning in use and the truth-value of the sentence.

h) Qualitative variables – 9 thematic representations of interactivity

The 'theme' variable is the main focus of this thesis and marks the beginning of the discourse analysis stage. Themes go beyond the facts or specifics of the article and were read from both the reference to interactivity and the article as a whole. They reflect the representations, depictions or 'construals' of interactivity which emerge through both subjective and non-subjective journalistic elements such as general vocabulary, uses of specific terminology, metaphorical tools, comparative analyses, choice of quotation or sources, content of reported speech or documents cited and so on.

At the outset, six different themes were identified from the literature on interactivity: *Empowerment:*, *Pedagogical*, *Aesthetic*, *Ludological*, *Information Society*, *Sceptical*. Following the pilot study and the initial coding process, a further three themes that were observed in the data were added, which are:

- **Commercial**: interactivity is associated with marketing or business generation
- **Hula-hoop**: interactivity is for "kids" (with no further explanation)
- **Futuropia**: interactivity relates to futuristic visions of media and communications

Each of these themes is now described in further detail according to coding criteria at the beginning of the content analysis as well as those which developed during the coding process.

Theme 1: Empowerment

This theme is mainly identified through use of vocabulary such as how interactivity *enables* actions of various kinds, *allows* participants to get data or *offers* possibilities for communication. This depicts 'access' as at least a basic element required but the theme is also frequently associated with notions of '*choice*' or '*selection*' which represents empowerment over content, while references to '*opportunity*' or the '*chance*' to do something, describes the 'potential' associated with the theme.

The original title chosen for this theme was 'Power to the People', because the kinds of terminology and discourses found in the pilot study (based on the first three years of the sample) appeared to focus on how interactivity 'allows' users to do things that, by implication, were perhaps not possible previously. This was taken, mistakenly, to be a reading of interactivity as a quality of communication events that gave power, literally, to users. This

falls neatly into the 'communication as process' style of analysis, where the focus is on sender, receiver and message (Fiske 1990). Within this reading, interactivity appears to have an effect of tipping the balance more towards receivers and also implies a definition of interactivity as a characteristic of the technology in use.

Later in the analysis it became clear that although enabling users was only one reading of the empowering aspect of interactivity and over time a wider view evolved of how interactivity and power are related. By the end of coding, the theme was identified where interactivity was found to empower one, several or all participants with different levels of power in different contexts, both within individual communication events but also, crucially, containing the *potential* to extend outside those events to empower other people, communities, institutions and perhaps even society at large.

Theme 2: Pedagogical

This theme is found where interactivity is associated with teaching and learning. Interactivity is represented as an aid to teaching and learning and thought to impact positively on outcomes. This is frequently expressed in basic terms where interactive 'tools' are used in teaching and learning practice, such as interactive whiteboards (IWBs). But it is also found in more evangelising discussions where interactivity is said to make people learn 'better and faster', particularly arising in articles about e-learning software or science museums. However, there is much discussion in between and a wide variety of subthemes are employed to support the pedagogical theme, such as the pedagogical theories of constructivism and instructionism, the value of science and science literacy in society and public policy on investment in information and communication technologies in the classroom.

Theme 3: Aesthetic

This theme addresses the sensory values that interactivity may contribute to communications and the subjective experience participants have of it during a communication event. The term aesthetic is used in a broad sense to cover a variety of perspectives which address interface design, relationships within the communication process and philosophical enquiries as to the nature of user, author, interface, text, narrative and so on.

Theme 4: Ludological

This theme addresses the very particular kind of experience of play. It is identified in representations of interactivity as an integral aspect of games, puzzles, and toys but also covers representations which suggest that interactivity brings a play-like quality to other kinds of communication. These include experimental art, museum exhibits, educational presentations and so on. When coding for themes, it was a straightforward operation to

include articles which discussed interactivity in relation to games. Non-game related articles were assessed as to the emphasis on the role interactivity plays in the communication event along with use of the terms 'play', 'fun', 'toy', 'puzzle' and so on.

Theme 5: Information Society

Coding for the information society theme is somewhat more straightforward than for other themes. Articles must make reference to specific information society policies, activities, events or documents at national, EU or other international level (e.g. eEurope 2005, Bangemann report, G7 Information society summit etc.). Alternatively the theme is identified in the specific although interchangeable terminology associated with it such as 'information society', 'information age', 'knowledge society', 'knowledge economy', 'information superhighway', 'infobahn', 'information infrastructure' or 'e-government' and so on. Other associations which might be inferred to be Information Society related, such as in articles on education policy or employment trends, are not considered strong enough to be coded under the information society theme.

Theme 6: Sceptical

This theme is identified in articles which expressly state scepticism over the nature or existence of interactivity, either directly or indirectly through quotes or citations. The use of "scare quotes" as noted earlier, can also introduce a sceptical tone. A number of key words or phrases further associated with this theme are 'hype' and 'buzzword', which convey a sense that more value is attached to the term than it deserves.

Theme 7: Commercial:

This theme is identified in three ways: first, where interactivity is represented as a revenue generating tool perhaps by being associated with new services or technologies such as interactive television, online banking and so on; secondly, where interactivity is seen as an advertising or marketing tool such as through interactive advertising; thirdly, where interactivity is represented as a business strategy for example in e-commerce.
This theme tends to describe interactivity in technical terms, usually from the communication as 'process' perspective. The costs of implementing 'interactive' services or products are frequently outlined and balanced against the benefits to customers/consumers.

Theme 8: Hula-hoop:

This theme was added during the coding process to cater for articles whose representation of interactivity does not fit other themes because it is identified by a single characteristic – it is

described either explicitly or implicitly as "You know… for kids!"[17] This representation implies that interactivity introduces a whimsical aspect to communication. It renders any further description null suggesting that it is not necessary for adults (or at least readers) to understand interactivity in any detail because it is for children. The idea of the 'hula-hoop' has been used previously to describe media technologies which may be regarded as a 'fad' rather than having any lasting consequences or transformative effects (see Winston, 2008). However, its use here is closer to McLuhan's (1959) "mythic aspect" of the hula-hoop as a technology whose innovative use by children (unlike the traditional 'hoop and stick') puzzles adults by confounding their expectations. McLuhan uses the hula-hoop to illustrate how media technologies shape modes of thought and communication, so that:

> "…as ever, the medium is the ultimate message. The child gets such messages, when they are new, much sooner than the adult. For the adult instinctively retards awareness that will disturb a cherished order of perception or of past experience; the child would seem to have no such stake in the past, at least when he is facing new experience" (ibid: p.345)

The 'hula-hoop' theme therefore suggests that children 'get' interactivity so therefore it is for them. By its nature, the hula-hoop theme may represent a lack of discourse compared to other themes, because the discourse communities involved are predominantly adults. However, the inability of their representations to capture this 'for kids' quality in any great detail is in itself material for analysis.

Theme 9: Futuropia:

This theme deals with representations of interactivity that link it with visions of the future, beyond those covered specifically by the Information Society theme. The futuristic vision might be a fictional or a real world predictive view, it may describe real or virtual contexts in which interactivity is invoked, and it may be a dystopian or utopian view. It is rarely neutral. Coding for the theme is relatively straightforward with many of the articles identifiable through use of the future or future conditional tense in verbs used. Phrases such as "in the future we will be…" or "soon our televisions will…" and "homes in twenty years time might…" and so on, are common features.

i) Data collection and analysis

Variables for each article were recorded manually in note with corresponding observations on decisions made throughout the coding process included. This allowed for decisions on extra variable options to be made, based on trends emerging in the coverage that highlighted gaps

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[17] As spoken by Norville Barnes in the *The Hudsucker Proxy* (1994) as he was presenting his new invention - the Hula-hoop - to the board of Hudsucker industries. Whenever he was faced with having to explain the product, he would use the same phrase whereupon his audience would nod appreciatively, although perhaps none the wiser.

in the codebook. It also allowed for easy revisions where necessary as each article's coding notes included extra non-coded details such as headlines, synopses and observations, which became valuable during the secondary discourse analysis process. The coding results were then transcribed as numeric data into spreadsheet form and finally exported to SPSS for statistical analysis of the data. Descriptive statistics were generated for each of the variables across the whole sample, and correlations among some variables were also measured and are outlined in the next chapter. The next section briefly describes the discourse analysis process which was then carried out.

5.5 Qualitative analysis – discourse analysis process

Unlike the relatively stable methodological requirements of content analysis, there is no single established method of conducting discourse analysis (see Howarth 2000:p134). But if content analysis can be described as breaking up data into its constituent parts to describe the key ingredients of coverage, discourse analysis can be seen as trying to restore the sense of semantic complexity and agency within the coverage, to see who or what is behind these ingredients and how language use shows larger discourses in circulation (see Deacon et al., 2007:p.156). The aim is provide a coherent analysis which will show how discourses are put together and "how discursive structure produces effects and functions" (see Potter and Wetherell, 1987, p.170). Coherence does not need to be found in the discourses themselves but relates to the analysis which should demonstrate both plausibility and fruitfulness (ibid). The thematic findings produced by the content analysis reported on the frequency with which each of the themes appeared in the coverage. The discourse analysis of interactivity takes each of the themes and examines them in more detail, by selecting a number of key articles which are either representative of individual themes, or of the circulation of a number of themes within the one article, or across a thread of articles throughout the sample.

The observations made during the quantitative coding process provided valuable material in terms of how themes were constituted and identified, and the various aspects of themes given emphasis in different ways across the coverage. This material was used to produce a 'discourse map' which draws the connections and overlaps between each of the themes, their subthemes and larger external discourses operating in the background. This process helped to distil the sample data down to approximately sixty articles, including both individual articles and article threads, representing a theme or 'subtheme' or a number of conflicting or overlapping themes. An outline of the discourse map and further details on the articles selected are available in Appendix B.

a) Selecting articles for discourse analysis

The selection criteria for the discourse analysis were not only based on the article's thematic representativeness but also the results for relevance of interactivity to the article overall, the number of references and the level, variety and quality of quotes and citations and so on. Care was also taken to present a variety of topics, contexts, spheres and definitions in the discourse analysis materials. This was to ensure that the quantitative results were adequately reflected in the selection and that variable types with high frequencies were not left out of the discourse analysis. However, the discourse analysis also needed to address low frequency quantitative findings as well as surprising or quirky material which is always an aspect of textual analysis (see Billig 1988). It also attempted to address some data left out of the codebook whose value was not recognised perhaps until after discourses analysis was underway.

Each theme was identified in the coding process as noted earlier through a number of descriptive features such as the use of metaphor, vocabulary, reference to particular contexts and so on. These were elaborated further under the discourse analysis which assessed how the themes arose in each article and their impact on meanings and other discourses circulating. There was a particular focus on language use and 'transformations' such as nominalisation (labelling a configuration 'interactive' or 'an interactive'), passivisation (of verbs which removes agency), 'relexicalisation' (reiterating or taking up other vocabulary in text) and 'overlexicalisaton' (use of several synonyms) which can result in simplification or mystification of concepts (see Deacon et al, 2000, Van Leeuwen, 1995).

Article threads were selected that followed a particular topic or developing story over time. These provide valuable material for illustrating how discourses shift over time, in relation to a relatively consistent overall context. The approach taken to their analysis was inspired by, although cognisant of the differences in the approach of conversation analysis, seeing each article as situated in the context of which it occurs. The conversation analysis influence focuses on the sequence of each contribution which aids interpretation as a story unfolds while the discourse analysis looks at the action orientation of the language used and the wider functions served (Wooffitt 2005) such as influence over the meaning of interactivity. Although written by different parties with different interests, a thread resembles a kind of drawn out conversation, particularly where articles appear to reflect on or respond to each other. While incomplete, sense can still be made of what emerges in relation to the discourses circulating and how these impact on the understanding of interactivity.

b) Variables relevant to discourse communities

A number of variables are particularly relevant in the identification and examination of discourse communities in the coverage. News genres 'are not neutral containers for different discourses' (van Leeuwen 2010), but are considered a contextual element relevant for a

discourse analysis (Tobin 2000). Therefore the coding of each article within newspaper genre or section was considered a factor in how discourses on interactivity are presented, by whom and to which community of readers. Discourses within the article were viewed in light of genre, along with other contextual elements such as the identity of the author, cited individuals and texts and so on.

Discourse communities were also identified in the analysis in the article authors or through direct or indirect quotation or citation or by references within the articles. The analysis sought to assess levels of agency within the coverage, to see who or what groups could be associated with certain discourses, why and to what effect on interactivity as a concept but also on discourse communities themselves.

Finally, an intertextual analysis was also carried out where articles included references to external materials whether academic, public policy, commercial or popular literature. This addressed the 'orders of discourse' in the analysis but also helps to strengthen coherence of claims based on the findings, showing greater context and scope for discourses beyond the articles themselves (see Potter and Wetherell, 1987). The choice of intertextual materials by authors or quoted individuals also indirectly connects the discourse communities associated with these materials to the coverage.

5.6 Strengths and weaknesses of research design

Both content analysis and discourse analysis have their limitations as methodologies. While content analysis is useful for statistical accounts of frequency or correlations between data and external variables, it is less useful for exploratory studies and cannot produce findings in relation to production of content or in relation to its impact but can only offer hypotheses (Deacon et al, 2000). Similarly, while useful for close exploration of individual or threaded conversations and their social context over time, discourse analysis is not appropriate for generalisable statistical findings. However, by using the methodical and systematic features of content analysis to provide the reliability and validity for a more flexible discourse analysis, the combination of both augments their strengths and caters for their weaknesses as a mixed method analysis (see Deacon et al, 2007:139-140). The research aim was not to draw conclusions about the newspaper coverage of interactivity, the production of articles nor impacts on readers, nor links with any other external factors, nor to arrive at conclusive findings about the most dominant discourse on interactivity in circulation. The aim is to describe the discourses of interactivity in circulation over a long time frame, towards a better understanding of the contested nature of its understanding. As such, this is just one suitable approach among others which could be applied to the topic.

The sample size, source and time frame presented challenges for the research and although the most efficient and representative quantitative sample possible was selected, it is possible

that it may not have sufficiently reflected the data variables over time. However, care was taken during the pilot study to compare baseline results from the total population with the proposed sampling technique and the results indicated no significant discrepancies. In fact, concerns over representativeness may if anything have produced too large a sample size resulting in a longer and more unwieldy quantitative coding process than was necessary to provide the reliability and validity necessary for a coherent discourse analysis. On the other hand, the results have provided a rich source of data for this and possibly further studies to which the findings could be applied.

It is not possible to infer the intention of discourse communities or speakers from the texts nor can safe assertions be made about production or reception of a text with this kind of methodology (see Thompson 1990, Deacon et al, 1999). Therefore, throughout the process, care was taken not to read too much into grammar and vocabulary of language use, to distinguish between inference and demonstration, to keep speculation to a minimum, to clarify the bases on which assessments have been made and to suggest alternative plausible interpretations where possible.

As there is no generally accepted formula for the validity of discourse analysis text choices, the quantitative findings were used where possible to validate and provide rationale for selection and assessment. However, the researcher's personal judgment and interpretative biases must be acknowledged particularly in relation to qualitative analysis. Again care was taken to provide clarity where such issues arose, to indicate the basis for particular interpretations and to offer alternative and oppositional readings where possible. The research aim formed the overall guiding principles for the methodological approach, which was not to search for a single answer or meaning for interactivity, but to seek out and attempt to explain the instability and incoherence in the discourses around it.

Overall, the methods used produced a substantial quantity of data of sufficient quality to produce rich material for analysis as well as providing evidence of further potential for research. The next chapter reports on the findings of the quantitative aspect of analysis.

CHAPTER 6

Findings: 15 years of newspaper coverage featuring interactivity

This chapter presents the content analysis findings, from the most general to the most specific features and draws a detailed picture of how interactivity is represented in the coverage. Overall figures for the total sample are presented first, followed by individual variables and discussion of important trends found.

6.1 Overall coverage

There are periodic fluctuations in the appearance of interactivity when coverage is viewed across the whole sample, as shown in Fig. 1. The first year of analysis, 1995, produced the lowest number of articles (35 units), with coverage peaking in 2000 with 109 articles, representing 12% of the total sample. The coverage fell back again to 42 articles in 2005, rising to 70 articles in 2009.
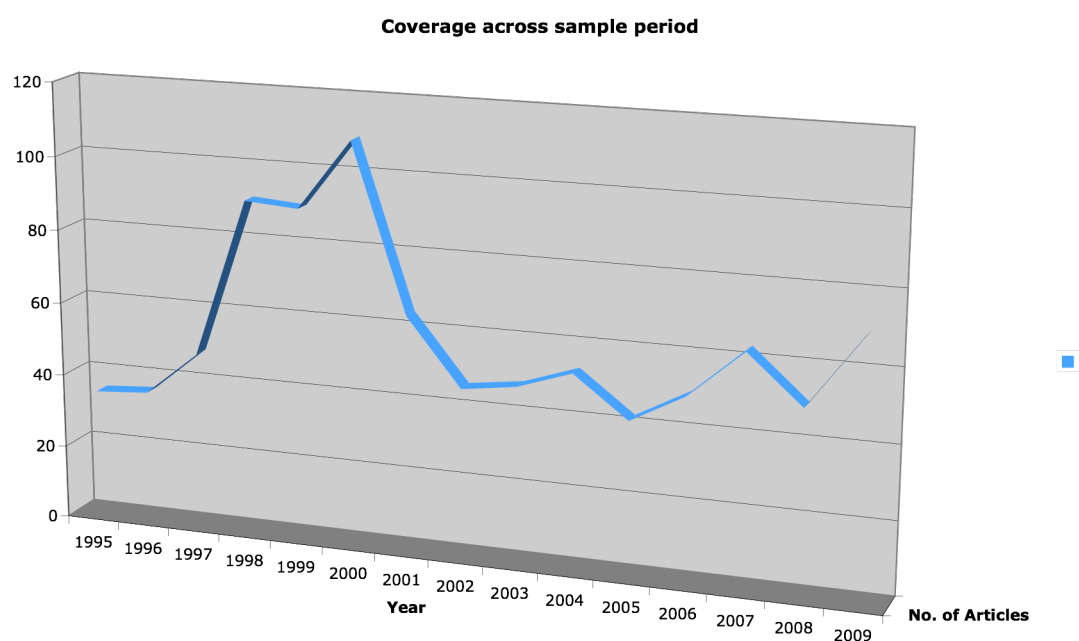
Fig. 1 Number of articles featuring 'interactivity' year by year across the sample period

These trends in the overall coverage over the sample period possibly reflect the general trends in the types of stories covered during those years, dealt with in more detail under Genre and Topics. For example, the low level of coverage in 1995 most likely reflects the early days of a concept emerging from niche interest areas into the public domain. As noted, that year saw the 'birth' of the world wide web and the release of new ICT products and services for the domestic market along with wider policy discussions and reflective popular literature about ICTs in society. The increase in coverage in the years leading up to 2000 reflects the

establishment of the internet, the growth of software, multimedia and games industries and so on. Coverage at this time also focused on predictions for the new century across a range of topics that would relate to interactivity such as technology, culture, education and so on. Stories relating to the convergence of industry and the parallel deregulation of the telecommunications industries which was occurring at that time, also shape the coverage, as do fears over the potential impact of the date rollover to 'Y2K' on computers and commercial and financial systems. Lastly, the year 2000 itself was at the centre of the series of dot com boom to bust cycles occurring at the time, which produced a cascading volume of ICT related coverage, which declined and then stabilised later in the decade. The gradual drop off in coverage in the years post 2000 somewhat reflects the disappearance of the larger issues from the background context, towards more nuanced coverage and smaller stories related to individual businesses, technological developments and media and communications issues. Coverage trends are explored in more detail under the individual variable findings to follow.

a) Frequency per article and instance

Over 80% of the articles in the whole sample made reference to interactivity (or interactive) just once. A further 18% contained between two and ten references to the concept while five articles (less than 1%) made over ten references each, representing some of the most discourse rich articles in the sample. Each reference was coded as either 'specific' or 'generic', with 41.6% specific references to 58.4% generic references found. This shows that interactivity is more frequently used as a generally descriptive term for media and communications rather than in reference to specific instances. This is important because specific reference limits the requirement to understand the role of interactivity outside the particular instance. But universal application implies similar potential for a wide variety of applications, which suggests that some agreement is required on the meaning of interactivity.

6.2 Types of newspaper articles in which interactivity features

Genre and Topic define the kind of articles in which interactivity features. Individual variable findings are presented first, followed by a discussion on trends in the types of coverage.

a) Genre findings

References to interactivity are most frequently found in the *Business* genre, representing almost one third of articles in the sample (at 29%). This is followed by *News* (at 14%) and *Technology* (at 13%) as shown in Table 1. Genre findings are important as they show that despite its strong association with ICT use in the literature, interactivity is twice as likely to feature in *Business* articles as in *Technology*. The frequency of the *Business* genre reflects the topics receiving most coverage, which include the *ICT*, *Media Delivery* and *Media Content*

industries (see further under Topics). The next most frequent genres are *Arts/Culture* (at 8%) and *Other* (8%) which cover a variety of material on science, health, travel and so on[18]. Both are important because they target different audiences and represent alternative discourse communities.

Genre	Frequency
Business	29%
News	14%
Technology	13%
Arts/Culture (+ reviews)	8%
Other	8%
Weekend feature	7%
Education	6%
News Features	3%
Media	3%
Lifestyle	3%
Sport	3%
Property	2%
Letters	1%
Opinion/Editorial	<1%

Table 1: Genre of articles across sample as a whole

Other notable genres include *Weekend Features* (7%) and *Education* (at 6%), also important in terms of audience and discourse communities represented. It is perhaps not surprising that *Editorial* and *Opinion* genres were among the least frequent, at less than 1%. Nevertheless, that interactivity features at all in these genres indicates that the concept at least permeates most areas of public commentary. Although coverage of interactivity in the *Property* genre is as much a reflection of the wide reach of property coverage during the property market boom in Ireland, as it is an illustration of the diffusion of interactivity discourse into different genres[19].

When Genre findings are addressed across the entire sample period, the fluctuations reflect overall coverage trends, but there are some notable shifts in frequency as shown in Fig. 2. The *Business* genre declined sharply from 2000 onwards, while *Technology* showed modest increases from 2004 on. This decline follows a concurrent decline in coverage overall, but it also occurs against the background of a genre shift in the newspaper itself which may be reflected in the findings (see Discussion further). Other genres showing changing fortunes include *News, Lifestyle* and *Other Genres*, all ending the sample period on a modest upward trajectory while *Education* reaches a plateau from 2005 onwards. Changes in newspaper formats along with the increasing segmentation of newspaper content in general over this period are also likely to be responsible for some of these trends.

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[18] As noted in the Methodology chapter, extra Genre options were added if more than ten articles of a particular kind emerged in the coverage. Five articles were coded as Science genre and so like similar minor genre types, these were grouped together under 'Other'.

[19] One edition of the newspaper in September 2006, had 74 pages dedicated to property editorial and advertising, a record for the newspaper (and indeed any daily newspaper in Ireland) (see Horgan et al, 2007)

**Trends in selected genres over sample period**
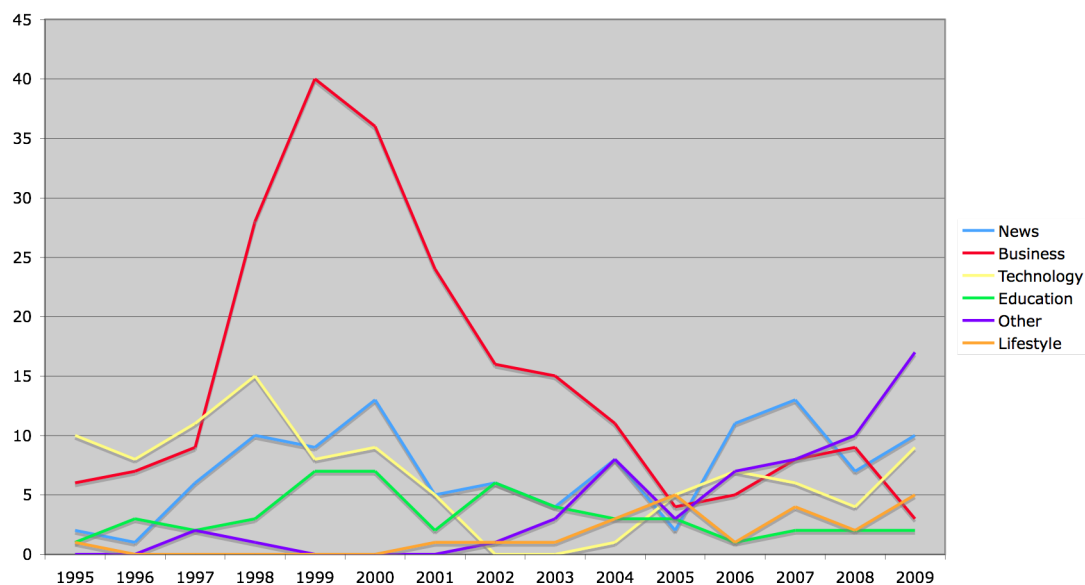
Fig. 2: Trends in genre frequency across sample period

b) Topic findings

References to interactivity appear across a wide variety of topics, but half the overall coverage is coded with five topics, as shown in Table 2. The most frequent topic in the sample is *ICT industry* at almost 14%, followed by *Media Production* (11%), *Media Content* (10%), *Arts/Culture* (at 9%) and *Media Delivery* (6%).

Topic	*Frequency*
ICT Industry	14%
Media Production	11%
Media Content	10%
Arts/Cult/Ent	9%
Media Delivery	6%
Education/Training	5%
Museums	5%
ICTs & Society	5%
Internet use/access	4%
Private sector Business (non IT/Media)	4%
Academics/Research	3%
Human interest	3%
Other (specified)	3%
Public policy (inc. Information Society*)	3%
Tourism	2%
Architecture/Construction/Development	2%
Science	2%
Sport	2%
Domestic politics	2%
Health	1%
International relations	1%
Legal issues	<1%
Public service, safety	<1%
Information Society (as subtopic)	<0.5%

Table 2: Topics in order of frequency

These findings echo the genre results, with the dominance of ICT and media industry topics reflected in frequency of *Business* and *Technology* genres. The most frequent topics reflect the many stories on global corporations like Microsoft as well as small Irish e-learning companies under *ICT Industry,* articles on old media industries such as television along with new multimedia and games enterprises under *Media Production* and items featuring product releases, such as websites, 'interactive' CD-Roms, music or games as well as reviews of specific titles under *Media Content.* These findings are important because stories with a commercial or business focus may emphasise a particular representation of interactivity. In terms of low frequency topics, one finding diverges from expectations. It was assumed at the outset of this study that the *Information Society* as topic (and as theme) would feature strongly in the coverage. It was particularly expected to appear in coverage of broadcast policy and legislation, because, as noted in the literature review, a feature of the policy literature is the link made between interactive television and access to public services as well as entertainment and shopping. However, the results do not bear this out. Although coded as a separate value under topic (and as Theme), *Information Society* appeared in just six articles over the entire sample period.

At least six of the top ten topics in the coverage can be associated with the development of the internet and new media during the sample period. This supports the strong association between interactivity and these fields in the literature. Yearly trends show significant fluctuations over the sample for these topics, which appear to reflect ICT and media industry issues, such as the occurrence of the dot com bust around 2000 (as shown in Fig. 3).
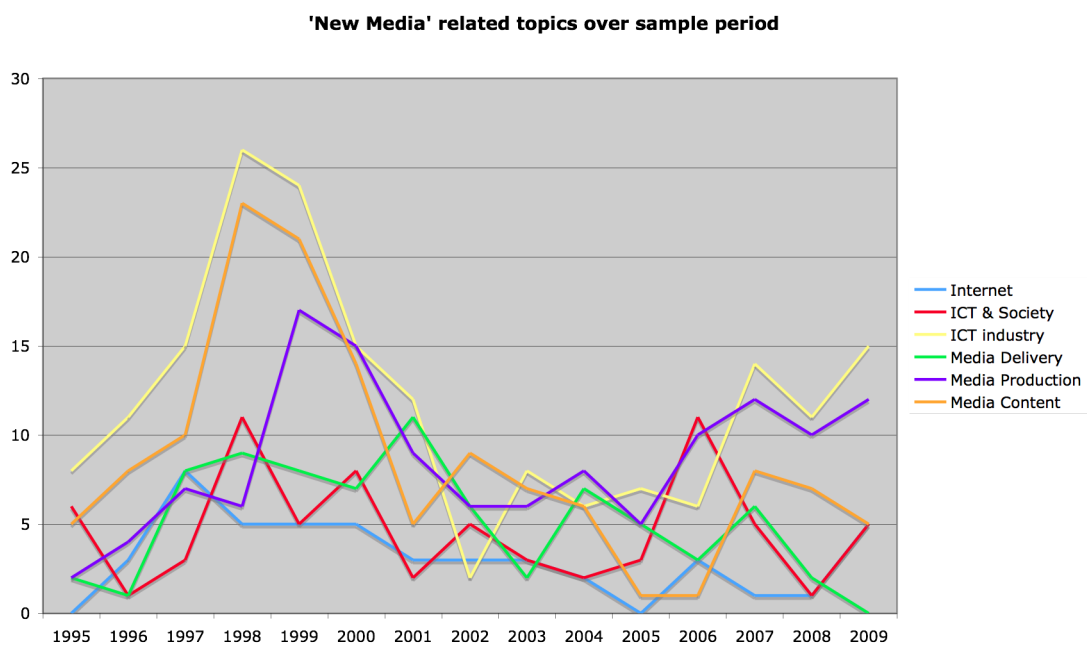
Fig. 3: Trends in frequency of new media related topics year by year

For example, while the *ICT industry* topic accounted for most references to interactivity in the sample, it peaked in the years leading up to the turn of the century but suffered a decline from 2000 to 2002, recovering only in the latter years of the sample. The *Media Content* topic also appeared more frequently in the early years of the sample but declined from 2000 (and particularly between 2004 to 2006). The decline in this topic's frequency most likely reflects changes in the reporting on and especially reviewing of 'new' media in this genre in later years, as well as the genre shift discussed further.

Three of the other four most frequent topics show relatively consistent coverage and end the sample period on an upward trajectory, which indicates that interactivity is increasingly associated with these fields (see Fig. 4). These topics are not immediately associated with the 'new' media which is significant, because it indicates a possible shift in discourses around interactivity in the later years of the sample. However, the *Busines (general)* topic shows a decline from the peak at the turn of the century, indicating that in relation to coverage of interactivity it may have been affected by similar issues to the ICT/Media industry.
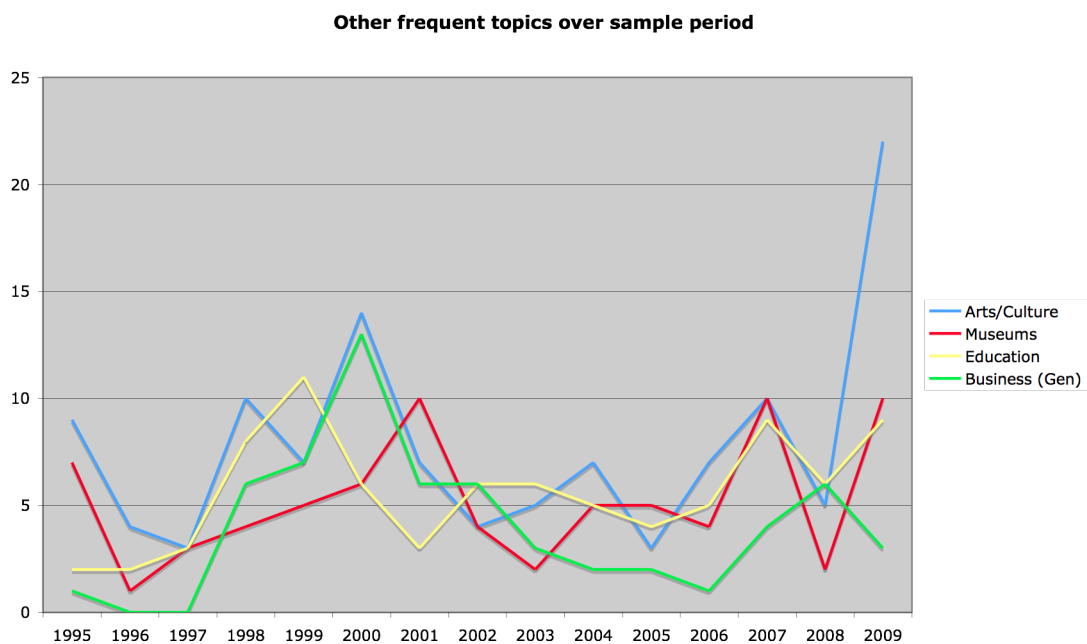
Fig. 4: Trends in frequency of other most frequent topics year by year

The *Arts/Culture* topic covers reviews of exhibited art, performance, music, film and literature as well as interviews with practitioners. The frequency of *Education/Training* as a topic reflects two separate trends in the coverage: a) the focus on Irish companies involved in e-learning products and services and their market performance during the dot com booms and busts and second, and b) the development of ICT in the classroom in terms of both practice and policy. The frequency of *Museums* in topics was somewhat expected due to an ongoing story on a proposed 'interactive' science museum for Ireland which continued throughout the

sample period. However, the results were greater than anticipated and reflected a sizeable number of opinion columns, features and analysis of other museums/exhibits in Ireland and abroad along with reviews of 'family' and particularly childrens' activities.

c) Discussion – Why the genre and topics in coverage are important:

As noted in the Methodology chapter, genres are not neutral and are considered a contextual element relevant for a discourse analysis (Tobin 2000, Van Leeuwen 2010). Therefore the position of an article within the newspaper and its styling within a particular genre must be considered a factor in how discourses on interactivity are presented. The genre findings show that *Business, News* and *Technology* genres are dominant in the coverage. However the relationship between *Business* and *Technology* coverage is particularly important for the discourse analysis.

In 1995, the *Irish Times* began publishing a weekly section dedicated to computers and technology called '*Computimes',* where *Technology* genre coverage was located in the early part of the sample. The findings show however that from around 1998 onwards, interactivity featured less in this section and more frequently in *Business*. The *Computimes* section was eventually wound down in 2001, and *Technology* genre stories were moved to a new subsection in the weekly Business and Finance supplement called 'Technology in Business'. From around 2004 onwards, the two genres were more evenly matched in frequency. This study does not look at the production of the texts under analysis and so the reason why this format change came about is beyond its scope. But when the findings for Genre and Topic are correlated, they suggest the editorial style of the technology genre may have been moving towards a business orientation by the turn of the century, or may have been influenced by its new location within a business supplement.

By the late 1990s, the *Irish Times* had a well-developed and authoritative voice on technology, not least because of its reputation as a 'pioneer' in online journalism (see Horgan et al, 2007). The paper frequently included reviews of new websites, CD-Roms, games and so on, while a number of articles in this topic even reported on the launch of a website, an indication of their news value at the time. These articles were coded under the *Media Content* topic, frequently appearing within the *Technology* genre. Indeed correlations between topic and genre show that 28% of articles in the *Technology* genre were coded with *Media Content.* However, the decline in the *Media Content* topic during later years of the sample and rise in the *ICT Industry* and *Media Production* topics, corresponds with the shift in position and possibly in editorial focus of the *Technology* genre. The format position and name change suggests that the emphasis moved away from stories on technology content and uses, towards stories about the technology business within this genre. The result is that a number of *Technology* stories adopt a business style, which means that possibly a third or more of all the

coverage in the sample is styled as business coverage but located in both *Business* and *Technology* genres. This is significant because business interests and discourse communities are more likely to be represented and this is likely to impact on depictions of interactivity. These findings also allow for some observations on ICT reporting in general. They suggest that in the early years of the sample, newspaper coverage was focused on the *content* produced and circulated in new media. The number of reviews in the coverage illustrate a clear emphasis on readers as *users* or *audience*, with the newspaper acting as guiding voice. Later, the move towards coverage of industry and production issues, means more coverage of devices and applications, and emphasis shifting to the *containers* of content. Readers are now regarded as *consumers* of products, as well as (or pehaps rather than) *audience* for content. There is also possibly an alternative view of readers as *shareholders* in the technology companies who produce devices and applications with the newspaper in the role of market analyst. Further research would be useful in ascertaining how readers have been addressed through ICT coverage in the media and the subsequent impact on associated ICT discourses. This illustrates how the analysis of a concept like interactivity can be used to reflect on issues in ICT coverage in general.

A business-oriented slant to coverage can also be observed in the low frequency of the *Information Society* topic. The IS as overall policy does not appear to provide a significant public interest or source of news for the print media. This contrasts with the topic of *Media Delivery* which features frequently due mainly to coverage of 'interactive' digital television services. This topic also features associated EU and national legislation and policies as a rich source of news and discourse analytical material. This is an important finding as it suggests that policy discourses by themselves do not have traction in coverage compared with policy that is connected to commercial discourses.

The presence of *Arts/Culture, Education* and *Museums* as significant topics in coverage, is an important counterpoint to the business orientation of much of the coverage. They not only present potential for alternative discourse communities and representations of interactivity, but also different contexts for communication which are examined further in the findings. When considered in the context of media content reviews in the coverage, it is notable that museum reviews do not occupy a more formal position beyond tourism and lifestyle reporting. If museums were considered as media, much of their coverage would be coded under *Media Content* and this topic would be by far the most frequent in terms of coverage relating to interactivity, outstripping *ICT Industry* and *Media Production* by a significant margin*.* This shows again how coverage of interactivity can open up other issues in media and communications for examination. The position of museums within the public discourse will be addressed further in this study.

6.3 Contexts and technologies associated with interactivity

Context is a combination of geographic location, domain of communication, specific venue and configuration of technologies or media being utilised (if any) in the 'interactive' communication. Individual variable findings are presented first followed by a discussion of important issues arising.

a) Location findings:

As expected, *Ireland* is the most common location referenced in articles, represented in over half of the coverage, as shown in Table 3. The next most frequent location is the *US*, receiving significantly more attention than the *UK*, and three times as much the *EU* (including any individual EU country).

Location	Frequency
Ireland	56%
US	15%
UK	9%
None specified	6%
EU	5%
N. Ireland Other	4%
The future	1%
Fictional place Virtual context	<1%

Table 3: Locations referenced in the coverage

This is an important finding because discourses around interactivity may be subject to influences from other locations, particularly where examples are given or discourse communities are quoted or cited. These findings indicate the potential for more influence from *US* perspectives than the *UK* or *EU*, simply due to the number of references.

b) Domain findings:

The domain of communication most frequently associated with interactivity is *Entertainment*, representing one fifth of all articles, as shown in Table 4.

Domain	Frequency
Entertainment	20%
Business/Commerce	18%
Education/Training Communications – private/commercial	14%
Heritage/Museum/Tourism	7%
Reference Arts/Culture display	5%
Public sector/Government comms Research projects Advertising/marketing	3%
Tour/travel - virtual/space/interior Music News Other	2%
Theory/Discussion	1%

Table 4: Domain of communication associated with interactivity

The *Business* domain is next most frequent at 18%, followed by *Education* (14%) and private or commercial *Communications* (at 14%). The domain of *News* does not feature as highly in the coverage as might be expected, which is notable considering the interest in the literature on the relationship between interactivity and online news.

c) Venue findings:

Venue concerns the physical and social contexts of communication and gives detail on *where* interactivity happens. The most frequently occurring venue in the data is *Online*, representing almost a quarter of all coverage. The next most frequent venue is *Home* (at 16%) followed by *Public Space (other)* at 14%, shown in Table 5.

Venue	*Frequency*
Online	24%
Home	16%
Public space (other)	14%
Workplace	12%
Educational establishment	12%
Exhibition space	10%
Not specified	4%
Console/player	3%
Other	3%
Private space (other)	2%

Table 5: Venue where interactivity takes place

When Venue is correlated with Domain, the data clearly shows a wide variety of communication types that take place *Online* (see Table 6). The most frequent domain is *Communication*, which supports the emphasis on CMC research in the literature and also Poster's (1995) observations that it is (still) the most popular activity online at least in terms of interactivity.

Venue vs. Domain *'Online' Domain types*	*Frequency*
Communication	32%
Business	16%
Education	12%
Reference	11%
Entertainment	8%
News	5%
Other	5%
Arts/Culture	3%

Table 6: Communication domain of online interactivity

The next most frequent domain is *Business*, a notable finding also, as commercial transactions do not receive as much interest in the literature on interactivity, even though the concept is clearly associated at least in discourse with e-commerce. *News* is slightly more frequent online than overall, but again is not as frequent as expected, a finding explored further in the discussion.

When venues are aggregated into public and private, the findings show that over half are public, (as shown in Table 7). This is a significant margin over private, hybrid or unspecified venues and, considering that some of these may also have public aspects as noted further in the discussion, the margin may be even bigger in practice.

Venue – Public/Private	Frequency
Public space (Work, Education, Exhibition space, Public Other)	48%
Hybrid (Online)	24%
Private space (Home, Console/Player, Private Other)	21%
Other/Undefined	7%

Table 7: Public and private venues of interactivity

Without access to the actual locations and participants involved, the amount of detail available for coding Venue specifics was limited. However, the findings are important as it is an aspect of context missing from previous research. The role interactivity might play in public as well as private communication will be explored further in the discussion.

d) Configuration findings:

In terms of what media or technology is involved in the interactive reference (if any), the most frequent configuration found is *www* (i.e. browser or other internet access) at 17%. This is followed by *TV* at 14% and *Exhibit* at 10% as shown in Table 8. The frequency of the *www* configuration echoes the most frequent Venue (*Online)* and is likely to reflect common practices. The high frequency of the *Exhibit* configuration also follows a consistent trend in the sample of reference to museums and galleries and their associations with interactivity.

Configuration	Frequency
www	17%
TV	14%
Exhibit	10%
Title (of company, course, conference etc.)	8%
Face to face – non mediated	7%
E-learning app Generic unspecific description – e.g. services, products etc.	5% each
CD/DVD Theatre/performance Building/Space	4% each
Map/guide application Software – desktop Other Config	3% each
Touchscreen/kiosk/whiteboard Game – console, platform Internet application	2% each
VR/Sensor/Haptic device Advertisement	1% each
Online only game Other networked application	<1%
Phone app Fictional/futuristic Mutlimedia	<0.5%

Table 8: Configuration of interactive reference

90

However, a high frequency in the sample does not necessarily describe a common configuration in practice as a number of discussions of interactive communications refer to configurations in the abstract. For example, articles coded for *TV* may contain minor theoretical references to "interactive television" while *E-Learning* configurations arise as business products as well as in use in educational contexts (see Themes further). Correlations between Configuration and Topic show that articles coded with the *E-Learning* configuration, are more frequently coded under the *IT industry* topic (28%) than the *Education* topic (23%). This occurs for example in stories which refer to interactivity as a description of company services rather than detailing actual education and learning scenarios. This is important as it shows that the initial indications that education is a frequent topic do not necessarily indicate a move away from business interests.

Fourth most common in configurations is *Title,* which refers to use of the word 'interactive' in the name of something (e.g. Disney Interactive, a division of the Disney company) rather than being descriptive of communication. When correlated with Topic, one third of the cases with this configuration relate to *IT industry* stories (at 33%). The other topics most frequently associated with this configuration are *Media Production Industry* and *Media Content*. Meanwhile, the *Generic* configuration is also frequently associated with the *IT industry* (at 23.4%) and *Media Content* (16.9%) topics. This means that a significant proportion of the business coverage (which dominates the coverage overall) features a purely nominative use of the term interactivity, with the result that such articles have low discourse analysis potential.

The frequency of the *Face to Face* configuration (at 8%) is important, as it indicates that the unmediated social interaction mode is still part of the discourse and may influence how interactivity is understood in other configurations. When correlated with Topic, this configuration is most frequently associated with *Education & Training*, which reflects the emphasis on comparative standards in the literature. This may be relevant when analysing the pedagogical discourses in circulation.

Some of the more unusual configurations which arose required new values to be added to account for them, such as *Buildings/Spaces* and *Maps/Guides* which together account for over 7% of references to interactivity. When correlated with Venue, these configurations are most frequently associated with *Exhibition Spaces* and *Public Spaces,* (see Table 9).

Configuration	*Frequency of Venue Associated*
Building/Space	Exhib Space (54%)
	Public Space (31%)
	Edu/Online (4%)
Map/Guide	Online (63%)
	Public Space (9%)
	Exhib Space (9%)

Table 9: Building/Space and Map/Guide Configurations correlated with venue

They are also associated with the *Online* venue, which implicates interactivity in more specific uses such as map reading, rather than general browsing. These findings suggest a niche role for interactivity in mediating space in communications online and possibly elsewhere.

Games and phone applications are among the less frequent configurations in the sample, despite their popularity generally in practice. However, as with the high frequency values, a low frequency in the sample does not necessarily reflect a rare configuration 'in the wild'. This finding merely suggests that games are not as frequently *discussed* in the coverage in relation to interactivity. This is an important distinction when assessing discourses and discourse communities which may be of influence over interactivity, as some communities (such as game players or indeed users generally) may not be represented proportionately to their size in practice. This issue will also be addressed under 'Voices' in the texts further. Tracking some of the key configurations over time shows how some feature consistently, such as the *Map*, *Building*, *Exhibit* and *Face to Face* configurations, and appear to be on an upward trend towards the end of the sample as shown in Fig. 5.

Key configurations over sample period
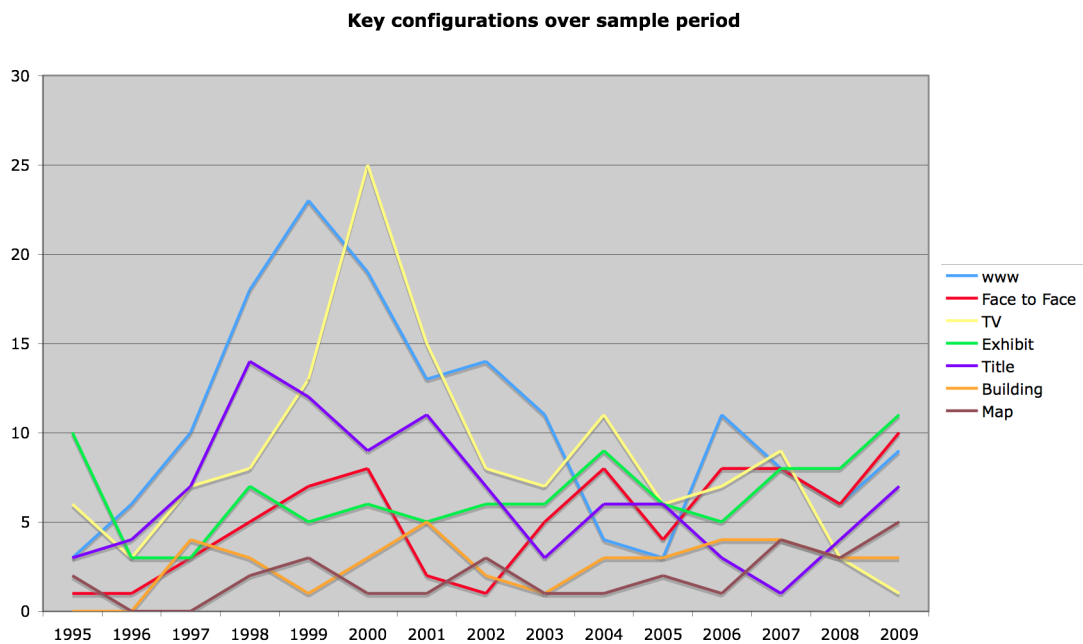
Fig. 5: Trends in frequency of configurations year by year

On the other hand the most frequent configurations overall are those showing the most dramatic fluctuations and even decline towards the end of the sample, such as the *TV* and *www* configurations. Again, these are not trends in use, but trends in *discussion* of interactivity related to use. In this case the discourses are likely to follow trends in discussion of conflicting and problematic issues of use, rather than popularity or frequency.

92

e) Discussion – Interactivity in context

These findings present important information about the various communication contexts with which interactivity is associated. The types of communication most associated with interactivity are business and entertainment, which reflect the business orientation of the coverage in general. Education, communications, museums and culture all again provide some balance in terms of alternative strategies and goals of communication in the coverage although as noted, e-learning communication features more frequently in relation to the *ICT Industry* than the *Education* topic. This is important because it suggests that alternative contexts may not necessarily produce different discourses about interactivity.

The low frequency of *News* communication was unexpected. At first this appears to suggest that *News* is regarded as a one-way information transaction, not strongly associated with interactivity. But it may also reflect a discrepancy between discourse and practice (as of course all the findings might), because online news was certainly increasing during the sample period even though it is not addressed in the coverage to any great extent. In any case, even minor references to online news are valuable because they represent a crucial boundary in a shifting media landscape. The discourses on interactivity in these articles are significant because interactivity is considered to be a differentiator between old and new media, between print and online news (see Lister et al 2003/2010) even if implementation of online news 'lags behind sentiment' (see O'Sullivan 2005). The value of these discourses lies in the content but moreso in the context of an incumbent news media acknowledging the features of their competition (and perhaps successors as '*morituri te salutant*'), thus representing a significant discourse community in themselves[20].

Of course much news communication is carried out in private, while the findings for venue show that interactivity is more frequently associated with communications in public places. This finding is important because as noted in the literature review, the HCI perspective has a strong influence not just on interactivity theory but also in the relevant disciplines of graphic and multimedia design. But HCI traditionally assumes a private realm of communication between user and machine, indicating that the literature may not be representative of interactivity in practice. This issue is compounded by the acknowledged scarcity of research on interactivity in communications in the public space (see Heath et al, 2004).

Public venues have distinct characteristics and challenges for communication, and may require a combination or layering of several levels of interactivity and social interaction. Some venues and media/technologies display both public and private features and present a challenge for coding and research in general. For example, portable media such as games

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[20] "…morituri te salutant" translates as "those who are about to die, salute you", attributed to slaves and gladiators greeting the Emperor at a particular 'games' event, before the slaughter begins (Suetonius, Divus Claudius, 21.6). The rhetorical power of the statement is not so much in the salutation itself as in the context of the event, the relationship between the condemned and the Emperor and their decision to describe themselves thus.

consoles and music players might be considered private by users, even though they may be used on public transport, or in other public venues. The mobile phone or PDA on the other hand may be considered a private communication environment, regardless of where or how publicly users operate them. The *Online* venue is the archetypal hybrid venue and depending on the individual situation, usage can be considered either private-in-public (for example password protected access to websites, intranets, extranets) or public-in-private (social networking from home) or either wholly public or private. While interactivity has long been regarded as one of the characteristics of new media that allows for the collapse of space and time, this may not extend to the collapse of public and private sensibilities. As noted in the literature review, social networking research has only recently begun to address how the private/public balance is defined, possibly in the social context provided for by interactivity (see Papacharissi, 2009). Hybrid venues and uses such as these necessitate further analysis of context on multiple levels and again, the possibility of the layering of interactivities. However, this illustrates again how analysis of interactivity can elucidate wider issues in media and communications research.

Newer configurations appear to be adopting a stronger association with interactivity in the coverage than the traditional *TV* and *www* configurations as the sample progresses. Although again these trends reflect discussion about interactivity and not necessarily actual use patterns. The findings are still important however, because interactivity is associated with all configurations at one time or another, indicating it has fluidity as a feature of communication contexts and/or processes in general rather than specific constructs.

Indeed the value of interactivity in describing the potential of media and communications is reflected in the findings for the configuration 'title' which labels an object interactive. These are useful for assessing subjective evaluations, particularly on the part of a particular discourse community. Specific configurations can be assessed somewhat more objectively as they carry specific technical or contextual features which can be directly compared with the implied definitions or sphere of interactivity operating in the reference. On the other hand 'title' or 'generic' configurations like 'interactive services' are more abstract. However, when viewed in light of the relevant discourse communities or voices in the coverage, they can highlight a number of issues, such as either a) the speaker does not perhaps understand how or why something is interactive, b) there may be a public relations message operating, c) interactivity is being used as a 'catch all' term for products and services on offer, d) the reference has been passed on from another party, unquestioned or unqualified in discourse, or e) interactivity is invoked because it is thought there is an expectation for it, and so on. Any one of these possibilities provides material for discourse analysis and so, even when lacking in detail, the configuration can help to answer questions over how and why interactivity is discussed. It is worth noting that many companies adopted the term for use in business names,

particularly at the turn of the century, because interactivity had (or perhaps has) a certain value or cachet for the business community. This issue will be addressed further in the discourse analysis.

Finally, the reality of coverage in a small semi-peripheral country is reflected in the location findings. Although regulated and policy driven from an EU and national perspective, Ireland's markets for telecommunications and media are largely subject to US interests through direct investment in cable services, media production and content and the IT industry (see Murphy, 2009). There is also a return interest in US markets on the part of Irish e-learning and games companies, whose operations are followed closely in the coverage. UK interests in the Irish broadcast market are covered to a much lesser extent. Several notable articles discuss US experiences with media and technologies, such as with interactive television, which will form part of the discourse analysis.

6.4 Meanings of interactivity in circulation

Meanings are measured in two separate complimentary ways in the coding process. First the 'Mode' of interactivity is coded which asks 'with what' a participant is interacting (following the modes of interactivity in the literature review). Then the reference to interactivity is coded for 'Definition', which seeks to infer from the text whether interactivity is understood as a characteristic of the medium, relating to the context of communication, within the perception of participants and so on. Discussion and findings for each of these variables is presented here.

a) Discussion of findings for the modes of interactivity

The most frequently occurring Mode in the sample is interactivity with *Data* (at 36%) followed by interactivity with *System* (at 18%) and *Others* (at 17%) as shown in Table 10. However, despite being the primary focus in the literature, and HCI being a dominant theoretical perspective, interactivity with *Machine* is found at a relatively low frequency of 8%.

Mode	Frequency
Data / Content	36%
System / Services	18%
Others / Other entity	17%
Space	10%
Machine / Computer	8%
Objects	5%
Other	4 %
Money	2%

Table 10: Mode of interactivity for whole sample

Several additional mode values were added during the coding process including *Space, Objects*, and *Money*. The mode of *Space* represents 10% of the sample, a notable finding as along with *Objects,* it reflects the presence of museums as topic, exhibition and public spaces as venues and buildings as configurations, but also their virtual equivalents online and in games.

Correlating Mode with Venue gives a good indication of where and how certain kinds of interactivity take place. Each article was coded for up to three modes and the findings show almost half of the interactivity taking place Online is with *Data* (47%) as shown in Table 11. This reflects the number of references to general web browsing in the sample. The next most frequent mode of interactivity in the online venue is with *Others* (20%), reflecting both social and business communication uses. Social networking was only beginning to emerge in the coverage in the final year of the sample so business communications was more frequent in the coverage overall.

Venue	Most frequent Mode	2nd most frequent Mode	3rd most frequent Mode
Online	Data/Content 47%	Others 20%	System 18%
Home	System 37%	Content 30%	Machine 18%
Public space (other)	Content 28%	Others 26%	Space 21%
Workplace	Content 29%	System 26%	Other/Undef 16%
Educational est.	Content 39%	Others 21%	System 19%
Exhibition space	Content 37%	Space 32%	Objects 13%

Table 11: Correlating Venue and Mode of Interactivity

The third most frequent mode of interactivity online is with the *System* (18%), representing references to public services, e-government and so on. However, a much larger proportion of the *System* mode of interactivity occurs in the *Home* venue. This reflects references to interactive television and discussions about the potential of this medium to connect users with wider systems in society. Meanwhile interactivity with *Objects* almost exclusively features in the *Exhibition Space* venue (at 13% of references), which suggests that this is a unique mode of interactivity to that location. It is also a mode showing an upward trend over time, as are *Data, Others* and *Space*. Interactivity with *Money* had a short lived peak around the year 2000 possibly reflecting coverage of financial institutions bringing their services online.

b) Definitions of interactivity – findings:

The most common understanding or definition of interactivity emerging from the data is *Characteristic of the medium (*at 41%), followed by *Application of Design* (at 33%) as shown in Table 12. Interactivity was only found to be related to the *Perception of Participants* in 7% of the sample. This indicates that user perceptions of interactivity are not part of the discourse to the extent to which they are emphasised in the literature.

Definition	Frequency
Characteristic of the medium	41%
Application in design/communication	33%
Context of communication	16%
Perception of participants	7%
Other/Not possible to specify	3%

Table 12: Frequency of definitions of Interactivity

It should be stressed here however, that users themselves are all but missing from the coverage, as outlined further (see 'Voices in the coverage'). This is important in the analysis of the discourse communities, because definitions and discourses emerging from industry and other interests are likely to dominate.

The results for '*Application*' at 33% are also important, suggesting that in a third of references, interactivity is understood to reside at the interface level as a function of design.
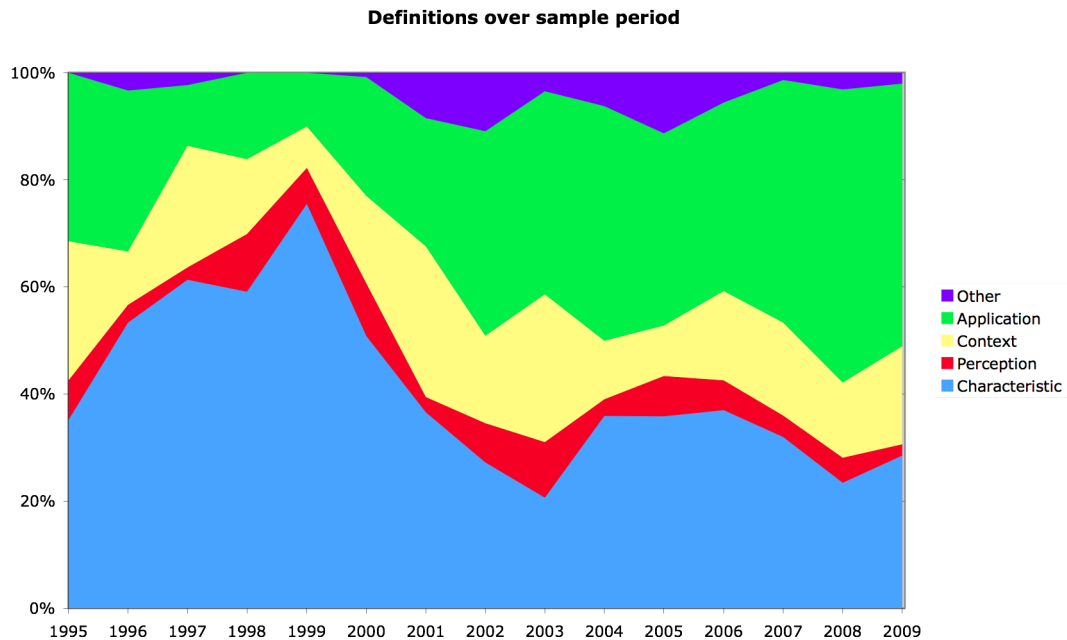
Fig 6: Tracking the inferred meanings of Interactivity over time

Also when tracked over time, *Application* outstrips *Characteristic* and *Perception* (see Fig. 6), suggesting a growing role for the interface along with perhaps greater appreciation of the processes involved in producing 'interactive' communications.

When definitions are correlated with other variables, we can begin to see from where such meanings might emerge. For example, correlations with topics show that the *Characteristic of the medium* definition is most frequently associated with media and IT industry topics (see Table 13). Similarly, the most frequent topics associated with the *Perception of users* definition, are the those with more focus on audience and reception including *Arts/Culture*, *Media Production* and *Media Content*. These findings reinforce the importance of examining

the discourse communities behind such discourses, with users themselves underrepresented.

Definition	Most Freqeunt Topics
Characteristic	IT Industry (14%), Media Production (11%), Media Content (11%)
Application	IT Industry (13%), Arts (12%), Media Production (12%)
Context	Arts (13%), IT Industry (11%), Media Production (9%)
Perception	Arts/Culture (17%), Media Production (17%), Media Content (12%)
Other	Business - non IT/Media (22%), IT Industry (20%), Sports (20%)

Table 13: Correlating Definition and Topic

Meanwhile correlations with configurations show that the *Characteristic of the Medium* definition is most closely associated with *www* and *TV* (see Table 14). However, *www* is a frequent configuration under almost all definitions, while *TV* and *Exhibit* also feature strongly, reflecting their dominance as configurations overall.

Definition	Most Frequent Configurations
Characteristic	www (19.3%), TV (16.3%), Exhibit (11%)
Application	www (15.6%), TV (13.6%), Exhibit (12.6%)
Context	F2F (18.2%), www (15.5%), Title (9.7%)
Perception	www (19.5%), Exhibit (15.9%), F2F (8%) Theatre/Perf (8%)
Other	Title (77.5%), Generic (10%)

Table 14: Correlating Definition and Configuration

Each article could be coded for up to three separate definitions, to allow for multi-dimensional definitions to emerge, and clearly individual configurations are associated with a number of different definitions of interactivity.

c) Discussion – the meaning of interactivity in the coverage

These findings show that interactivity is understood to have different meanings, depending on the context of communication, the general topic within which it is discussed and the discourse communities operating. This does not necessarily mean however that there are conflicting views about interactivity for example in relation to the same configuration. Configurations associated with more than one definition may reflect where multiple interactivities take place. Overlaps in discourses might emerge under certain topics because different discourse communities have different strategies and goals in mind for interactivity. These agreements, overlaps and conflicts of meaning in circulation with different configurations under different topics are useful for the discourse analysis.

Clearly, the understanding of interactivity as *Characteristic of the Medium* while the most common definition is not inherently connected to the mode of *Interactivity with Machine,* as this mode did not feature frequently. This suggests a distinction between data and delivery mechanism or the content from the container, in the discourses presented. The majority appear to understand interactivity as a characteristic of the container that *facilitates*

interactivity with *Data* or *Other People* and so on. The goal of the interactive communication defines the dominant mode in operation. This may be important when examining the layered interactivities that appear to take place in certain contexts.

Although *Characteristic of the medium* is the most frequent definition, a turn to the interface appears to be underway later in the sample in the increasing depictions of interactivity as a function of *Application/Design*. This suggests that HCI and the fields of multimedia and graphic design are important in how interactivity is manifested, but as noted earlier, greater focus on public contexts is required to fully explore the role it plays in communication.

The *Perception of Users* is not a defintion of interactivity featured to the extent that it is emphasised in the literature, possibly reflecting the lack of user perspectives in the coverage. However there is no indication that users would automatically hold this definition of interactivity. Closer examination of the discourse communities operating in the coverage and the strategies and goals of participants in communication may illuminate how meaning relates to the position of individuals either as commentators on or participants in interactivity.

6.5 Voices in the coverage

a) Voices responsible for references to interactivity – findings:

The 'Voice Responsible' for the reference to interactivity gives some initial clues as to discourse communities represented. The vast majority of references to interactivity were attributed to the article *Author* (79%) with a further 12% of references attributed to persons *Quoted* and the rest in other cited materials (see Table 15).

Voice Responsible	Frequency
Author	79%
Quoted	12%
Company/Body Name	5%
Company/Body materials	2%
Cited documents	1%

Table 15: Voice responsible for reference to interactivity

Where the author is responsible for the reference to interactivity, the Genre of article is relevant to the discourse analysis in examining the target audience, the communication purpose and the style of writing employed. Two thirds of the articles in these cases were written by *News* and *Features* journalists (see Table 16). A further 7% were produced through agencies and international syndication, a small but significant group, which when considered along with the 'locations' findings, indicate an observable level of international influence on public discourse.

Author Type	Frequency where Author Voice is Responsible
News Journalist	36%
Features/Opinion Journalist	33%
No byline	20%
Agency	5%
News Syndicated UK/US	2%
Features/Opinion Guest	2%
Letter writer	1%
Other	<0.5%

Table 16: Author type in relation to reference to interactivity

If available, further detail in the coding process for author type might have yielded a more informative breakdown for news and feature journalists, for example by identifying technology, science and education correspondents. However, the data was not consistent in identifying specific journalist roles, but this detail is examined where possible in individual articles in the discourse analysis.

When the reference to interactivity emerges from a quote in an article, the most frequently responsible group are those whose occupation is in *Education/Research* (at 16%). This is followed by *Media Production*, *IT Industry* and *Media Delivery* communities, representing a third of the relevant references between them (see Table 17). This finding is important as these discourse communities hold significant interests which are relevant to how interactivity is represented. It contrasts with the very low frequency of *Users* and the general *Public* for the voice responsible in the coverage.

Occupation of Quoted persons	Frequency where Quoted Voice is Responsible
Education/Research	16%
Media Production industry	15%
ICT industry	12%
Media Delivery industry	11%
Business (other)	9%
NGO/Lobby Group	8%
Artist	6%
Student	4%
Analysts	3%
Government Rep Institutional Rep Legal Authority News Media Writer Political Rep (other)	2% each
Public	1%
User	<1%

Table 17: Frequency of quoted persons by occupation

Groups that represent general participants in interactive communications in practice do not appear to be represented in public discourses on interactivity. Meanwhile *Students* are also underrepresented in comparison with others in *Education/Research*, a finding which is of particular importance in discourses on interactivity in the *Education* context.

b) Who is quoted generally and on what topics? Findings:

Just over 40% of the sample contained quotes, and, while not always directly relevant to interactivity, these quotes may indicate the discourse communities operating.

Quoted Community Occupation	*Frequency*
Media Production Industry	15%
Education/Research	14%
ICT industry	12%
Media Delivery Industry	11%
Business	9%
NGO	6%
Artist - Individual	5%
Artistic Director	5%
Analysts	4%
Government rep	4%
Legal Authority	3%
Public, Students, Political Reps, Authors, Other	2%
Users, Media/Journalist	1%

Table 18: Frequency of quotes by occupation

In articles with quotes, those most frequently represented are the *Media Production Industry* (15%) followed by *Education/Research* (14%) and *ICT Industry* (12%), with *Media Delivery* and general *Business* coming close behind (see Table 18). Again these are significant discourse communities in terms of potential influence, particularly in light of the low frequency of *Users* and the general *Public*.

There are strong correlations between quotes and topics. For example the *Education/Research* community are most frequently quoted in articles coded with *Education*/R*esearch* as topic. Again however, *Students* do not feature in quotes under this topic which raises questions as to whether discourse is dominated by participants on only one side of the communication. Meanwhile *Media Production Industry* representatives were most frequently quoted in articles with the *Media Production Industry* topic as were *ICT industry* representatives under the *ICT industry* topic, museum directors and artists under the *Museum* topic and so on (see Table 19). But again, the *Users* and the *Public* do not feature in quotes.

Meanwhile the *Media Delivery* representatives are more frequently quoted in the *ICT Industry* topic than the *Media Content* topic. This finding reflects the convergence of industries and

interests occurring over the time period of the sample[21]. The *Analysts* on the other hand are visible across a number of topics, particularly *Media Delivery* and *ICT industry* topics. When quotes are correlated with genre, over 80% of analyst quotes appear in the *Business* genre, representing 10% of the quotes in this genre overall. This suggests that industry analysts are a significant source of news and comment in the business genre with potential for influence over discourses on interactivity.

Top 10 Topics	Most frequent quoted communities
ICT Industry	ICT Industry (35%), Media Production (13%), Media Delivery (12%) , Analysts (11%)
Media Content	Media Production (20%), ICT Industry (17%), Edu/Academic (8%)
Media Production	Media Production (40%), Media Delivery (12%), Edu/Academic (10%)
Arts/Culture	Artists (38%) Insitutional representatives (27%)
Media Delivery	Media Delivery (54%) Analysts (12%), Media Production (12%)
Education	Edu/Academic (41%) NGO (10%), ICT Industry (9%),
IT & Society	Media Production (28%), Edu/Academic (21%)
Museums	Insitutional representatives (16%) Artists (15%)

Table 19: Frequency of quoted communities within most frequent topics

The *Media Production Industry* group are the most widely quoted group overall, and include the *Advertising/Marketing* community, who individually represent 3% of all quotes, a relatively frequent finding for a subgroup. The influence of this group on discourses circulating in the Business genre is important because of the nature of their interests and specific goals in interactive communications. The discourse analysis will focus in particular on their contributions and the types of representations that emerge.

c) Discussion - voices in the coverage

Those who introduce the concept of interactivity into the coverage are important in terms of how and why the reference is made. The findings are useful generally to illustrate how particular groups may have influence on the coverage. But this information is only applicable practically on an individual article basis in the discourse analysis, where occupation or, in particular, journalistic field may be relevant to the discussion.

Articles without quotes are not immune from influence by various discourse communities. But these influences can only be inferred from other data such as topics, definitions and

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[21] Indeed the *Media Delivery* value for the Topic variable was itself converged during the coding process. Originally, *Media Delivery* included a number of subvalues which could be coded separately such as cable companies, broadcasters, telecommunications companies, satellite distributors etc. From 1999 onwards, however, it became increasingly difficult to distinguish between the different business types which had existed at the start of the coding process. The subvalues were removed and all were coded as *Media Delivery* for clarity.

themes which are examined further in the discourse analysis. Therefore, the quotes, while not always directly relevant to discourses on interactivity, are the only direct link with discourse communities as sources for article content and commentators on related issues. The findings illustrate how closely topic and occupation correlate, particularly in relation to the ICT and media industries. However the important and more interesting findings are where there is no immediate link between the topic (or indeed definition or other variables) and the group quoted. Again, these findings are more useful within examination of specific discourses in the analysis.

6.6 Themes in representations of interactivity in the coverage

This section addresses the thematic results from a quantitative perspective, in terms of frequency, while the discourse analysis chapters will deal more fully with the qualitative aspects of each theme in detail. General thematic trends are described first and then each theme is discussed individually in terms of findings and correlations which are relevant to the selection of articles for discourse analysis.

a) Trends in thematic representation

The theme most frequently associated with interactivity is *Empowerment*, found in over one fifth of the sample (at 22%). This is closely followed by the *Commercial* theme, at 20% and the *Pedagogical* theme at 18% as seen in Table 20. These findings largely reflect the kinds of topics, contexts and discourse communities found in the quantitative aspects of the coverage.

Theme	Frequency
Empowerment	22%
Commercial	20%
Pedagogical	18%
Aesthetic	11%
Ludological	9%
Futuropia	9%
Hula-hoop	5%
Skeptical	4%
Information society	<1.5%

Table 20: Frequency of Themes of interactivity

The *Empowerment*, *Commercial* and *Pedagogical* themes arise where business interests, instrumental definitions of interactivity and educational perspectives are found. Meanwhile, the *Information Society* theme again against expectations, was the least frequent in the coverage, found in just 1.3% of articles. This is in keeping with the trends in Topics, which suggests that industry activities rather than policy issues tend to drive coverage, an issue discussed further under the individual theme results.

The *Sceptical* theme also did not feature as frequently as expected, at just 4%, despite the emphasis in the literature on the hyped, contested and mythical value of interactivity as a concept. This is important as it suggests that while some theorists may be locked into a metaphysical framework of discussion, public discourses may have moved past problematic aspects of the concept. However, despite their infrequency, the discourse analysis will focus equally on these and all themes as each has an impact in terms of where, why and from whom they arise. Because each article could be coded for up to four themes, the interrrelation of themes within discourses is particularly relevant in the analysis.

b) Trends in themes over time

When the themes are viewed across the sample, the peaks and troughs reflect overall coverage to an extent, but some notable trends also emerge. The *Empowerment* and *Commercial* themes follow similar paths in the early part of the sample. However, both end on separate trajectories, with *Empowerment* relatively stable but *Commercial* in decline (see Fig. 7). Meanwhile the *Pedagogical* theme grows in frequency in later years of the sample, while *Ludological* and *Aesthetic* themes, although inconsistent, are also on the rise.

Themes over sample period
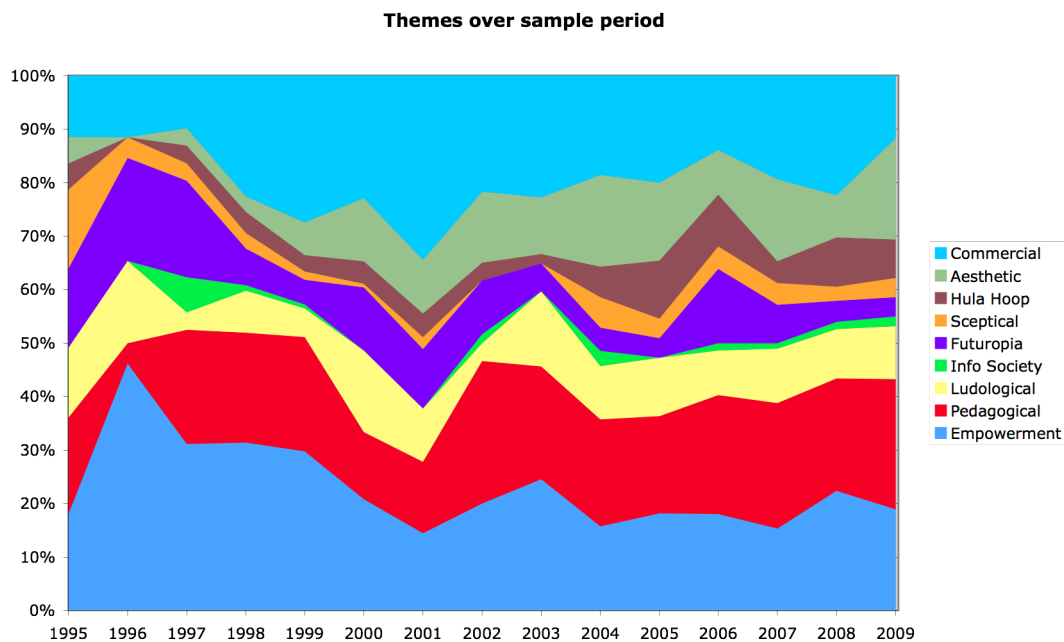
Fig 7: Trends in thematic representation over the sample period

These findings are purely descriptive of the overall picture and the analysis does not attempt to examine why these trends in themes emerge. But they do show how representations of interactivity generally appear to shift over time, possibly according to associated shifts in trends in each of the variables as outlined earlier. Further research could address this issue more closely by taking snapshots of thematic trends at selected points in time and conducting

deeper analysis at those points of more detailed data both from public discourses and other relevant independent variables.

c) Themes & quoted groups

At a glance, the groups most frequently quoted across all themes appear to reflect aspects of those themes, as shown in Table 21. However, correlations between themes and quoted groups do not aim to show a direct link between a particular perspective held and a potential discourse community. Themes are coded according to overall article content, regardless of quotes and quotations in many articles do not necessarily have relevance to interactivity. But of particular interest for this research are the more unexpected findings and overlaps between groups and themes, such as the frequency of *Media Delivery* representatives within the *Pedagogical* theme (at 12%) and the *Education/Research* group within the *Ludological* theme (at 4%). These findings will be examined further for whether hitherto unacknowledged discourse communities may be influential over particular representations in the discourse analysis.

Themes	*Most frequently quoted groups*
Empowerment	Edu/Research (10%) Media Delivery (9%) , Media Production, ICT Industry (8%),
Commercial	Media Production (16%), Business – non ICT/Media (15%) Media Delivery (13%)
Pedagogical	Edu/Research (15%) Media Delivery (12%) ICT Industry (6%),
Aesthetic	Artists (38%) Insitutional representatives (27%)
Ludological	Edu/Research, Insitutional representatives (4%) Media Production (3%)
Futuropia	Edu/Academic (7%) Media Production (6%), Media Delivery (5%),
Hula-hoop	Insitutional representatives (3%) Media Production (2%), Artists (1%)
Sceptical	Media Production (4%), Edu/Academic (3%) Media Delivery (2%),
Information Society	NGO, Media Delivery, Edu/Research (1%)

Table 21: Groups most frequently quoted within each Theme

d) Discussion of individual theme findings

i. Empowerment Theme

As noted in the methodology chapter, this theme operates on a number of levels:

a) *Access*: where interactivity 'enables' or 'allows' physical access to data or virtual access to places or environments.

b) *Content creation*: where access is allowed not only to data but also to the production process of content through user-generated content or control/choice over narrative

c) *Engagement*: where access and content are enabled and response is 'facilitated' to give a sense of learning or community creation

d) *Emotional expression*: where interactivity facilitates in 'channelling' or providing space for emotion, shared memory, or connection with others at a deeper level

These levels are reflected not only in the most common configurations for the theme – *www, TV, Exhibit* – but also in the finding that the theme is associated somewhere in the sample with *all* available configurations. This indicates that access is one of the basic features of the role interactivity plays in the many contexts of communication referenced in the sample. Meanwhile the domains of communication associated with the *Empowerment* theme include *Communication, Entertainment, Business* and *Education*, which reflect a variety of purposes or goals of communication suggesting different levels of engagement and/or learning. The levels are also reflected in the modes of interactivity associated with the theme, with *Data* and *System* and *Other people* frequently found, indicating a range of potential activity beyond mere consultation. *Media content* is the topic most frequently associated with the theme but *Empowerment* is also the most common theme in that topic which suggests a close relationship between the two. However, the topics under this theme include stories from industry as well as social and cultural fields, which link interactivity with potential for other levels of engagement beyond commercial and educational goals.

The discourse analysis will focus on coverage which is most representative of the many levels of the *Empowerment* theme, while also displaying as many of the fields of reference or discourse communities that invoke the empowerment features of interactivity. The analysis will also examine the beneficiaries of this empowerment, whether overtly identified users or 'covert' strategic participants in interactive communications, and also those who may be disempowered by this particular representation.

ii. Commercial Theme

The findings for this theme are significant because it was not one of the original six themes selected for analysis at the outset. This was mainly due to the the aspects of interactivity most pertinent to this theme – marketing and revenue generating potential – not being observed in the literature review. Although commercial interests are represented in the literature (through advertising, interactive television and so on), the discourses relate more to empowerment than the directly instrumental nature of interactivity in business. However, had wider reading been

carried out for example in the business and marketing fields, a *Commercial* theme may have been identified earlier.

What most distinguishes articles coded with this theme from others is the domain of communication in question. The *Business/Transaction* domain was by far the most common (at 18%) with the next most frequent domains also reflecting the more business-oriented communication types within the variable – *Entertainment* (9%), *Communication* (7%) and *Ads/Marketing* (3%). However, the *Education & Training* domain was fourth most common within this theme (at 4%). This again supports the argument that the commercial aspects of educational topics and contexts require examination as much, if not more than their pedagogical aspects.

This theme is also strongly aligned with particular configurations: *TV* and *www* are among the most frequent found, reflecting the highly commercial style of discourse around these technologies. The frequency of the theme within individual configurations shows that half of all of articles referring to *TV* were coded with the *Commercial* theme as were, perhaps not surprisingly, all articles with the *Advertising* configuration. Almost three quarters of the *Title* configurations were coded under the *Commercial* theme, again as expected because many of these titles were business related as noted earlier. However, over a third of the *E-learning* configurations were coded with the *Commercial* theme, again reflecting the dominance of e-learning businesses in the coverage, rather than educational perspectives. This is discussed further under the pedagogical theme.

Inevitably the topics again correlate strongly with the *Commercial* theme with *ICT*, *Media Production* and *Media Delivery* industries the most frequent topics. Indeed almost two thirds of all *ICT* and *Media Delivery* stories and over three quarters of the business (non-IT/media) stories are also coded with the *Commercial* theme. This latter finding is important as it indicates that business interests in general, and not just ICT and Media interests, make commercial associations with interactivity. Finally, over half of all articles in the whole sample citing the USA as location were coded with the *Commercial* theme, which indicates that US perspectives may be of particular influence.

The most representative articles for discourse analysis under this theme therefore focus on industry orientated topics, the *Business/Transaction* domain of communication*, the *TV* and *www* configurations and US perspectives in the coverage. The articles selected cover interactive television and digital terrestrial television (DTT) services, e-commerce on the web, advertising and marketing initiatives with new media and the overall context of internet development and broadcasting policy over the sample period. Each of these issues reflects discourse communities with particular perspectives on the meaning of interactivity.

iii. Pedagogical Theme

At the outset, it was expected that there would be a strong association between the *Pedagogical* theme and the topic of *Education/Training*. Indeed, the topic was found in one third of the articles coded with this theme. However, because all articles were coded for a number of topics and themes, the overall analysis shows the theme is associated with a much broader set of topics than just education. Other topics include *Media Production* (22%), *ICT Industry* (20%), *Museums* (18%) and *Science* (12%), while there is also notable frequency of articles on *Arts/Culture*, *Tourism* and *IT & Society*. In fact, while providing an interesting spread of material, the number of topics under the *Pedagogical* theme makes the discourse analysis more complex, as the selection of relevant articles for analysis needs to reflect a wide variety of contexts and interests operating within the theme.

However, while the findings show that this theme is represented across many different topics (and also Domains, Configurations and so on), many also display the *Commercial* theme. As noted earlier, the *Commercial* theme is strongly associated with *Education* as a topic and the *E-learning* configuration. The challenge then is to reflect in the discourse analysis the relationship between these themes, in both traditional and non-traditional educational contexts and the variety of industrial and political interests represented across the more frequent topics. By condensing the topics into the main stories and discourses with the pedagogical theme, the discourse analysis focuses on three subject areas, which are a) information and communication technologies (ICT) in the classroom; b) the e-learning industry and c) museums and education. These in turn provide ample material for analysis of the competing *Pedagogical* and *Commercial* themes, and others, along with the various topics, contexts and discourse communities represented in order to assess how interactivity contributes to the goals of communication.

iv. Aesthetic Theme

This theme shows strong associations with quoted groups, as artists and institutional representatives are those most frequently quoted in articles within this theme (see Table 23 above). Topics are also indicative of the *Aesthetic* theme, with the *Arts/Culture* topic, as expected, found in over half the articles coded with this theme. Articles on the *Museums* topic followed in second place (at 20%) followed by *Media Production* (12%). This finding suggests that the *Aesthetic* theme is strongly related to aesthetic and cultural aspects of communication, but also impinges on commercial values to be realised in media products, through interface and experience design.

The domain most frequently found was *Entertainment* followed by *Heritage/Culture/Tourism* which provides an opportunity for examining different communication contexts in the discourse analysis. Meanwhile interactivity is most frequently understood as in the

Application of Skill/Design under this theme which brings interface issues to the forefront in discussion. The discourse analysis therefore attempts to focus on contributions from artists, the museums and galleries context and the media production industry on the role of interactivity in interface design whether for artistic and cultural communication or business communications.

v. Ludological Theme

This theme initially appears to reflect coverage of the games industry and reviews of individual game titles, as the most common topics arising are *Media Production* and *Arts/Culture*, followed by *Media Content* and *Museums*. But there is also a strong focus in the topics on the playful aspects of other arts practices as well as in installations and exhibits. The most frequently found domain of communication is *Entertainment*, accounting for over half of the articles coded with this theme, which suggests that the playful aspects of interactivity are seen mostly as directed towards the pleasure of the audience. However, *Business/Transaction*, *Heritage/Tourism* communication and *Education* also feature suggesting a potentially serious edge to the ludological applications of interactivity.

Like much of the coverage, the *Ludological* theme is most frequently associated with the mode of *Interactivity with Data/Content* (at over 65%). However, a significant proportion of articles were coded as *Interactivity with Space* (over 30%), reflecting a virtual experience or environment. Like the *Aesthetic* theme, the *Ludological* theme therefore appears to address how interactivity impacts on the sense of physical space and presence, experienced by participants in a communication event.

The discourse analysis selects articles which reflect both the commercial and social aspects of the games industry and discourses around interactivity within it as both a technological feature but also an aspect of the play experience. It also seeks out discourses on non-game applications, such as in the education and training field, to examine the influence of the *Ludological* perspective on interactivity in other domains.

vi. Futuropia theme

This is the second of the themes added during the coding process because of trends in representation of interactivity in the coverage. Interactivity is associated with predictive visions of future technological paradigms and therefore *ICT & Society* is the most common topic, found in one third of articles. This topic includes coverage of general industry issues such as 'convergence' and 'Web 2.0' as well as specific concerns like the millennium bug ('Y2K'). Other topics frequently associated with the theme are *Media Production*, *ICT Industry* and *Media Delivery* which suggest that it generally follows industry activities which have a clear interest in future predictions, particularly in terms of how media and technology

might evolve and be used. The theme is also closely associated with the Domains of *Entertainment*, *Personal Communication* and *Business*, indicating emphasis on how these domains in particular might evolve.

The configurations follow a similar pattern, with *TV* accounting for one third of the articles (33%), followed by *www* (23%) although the next most frequent is *Exhibits/Installations* (12%) which hints at some non-industry representations. The most frequent definition is *Characteristic of the medium* (over two thirds of articles) and there are twice as many references to generic media uses as specific ones, which reflect coverage which is mostly in the realm of prediction.

The most frequent citations in the *Futuropia* theme come from the ICT industry and government, which reflect how ICT interests may be influential in producing visions of the future. It also suggests that government bodies may utilise aspects of the discourse even if communication domains relevant to them are not necessarily reflected in the coverage (such as government, policy and so on). However, the *Futuropia* theme is particularly notable for the presence of celebrity ICT industry interests such as Bill Gates and Nicholas Negroponte, references to whom were coded (as VIPs), although not subjected to further analysis[22]. This reflects their influence both in industry and research, but also through publication, both having published books at the start of the sample period, describing future ICT paradigms (see Gates 1995, Negroponte 1995).

The discourse analysis will examine representations of interactivity emerging from the technology prediction industry in terms of both fictional and real opportunities and threats. Articles which display some connection between research and reality will be contrasted with those that report incoherence between prediction and practices. Discourse communities relevant to both will be examined, particularly those where members carry disproportionate weight to other interest groups, and where long term strategies and goals relating to the role of interactivity can be observed.

vii. Hula-hoop theme

This theme also emerged from the coverage rather than the literature on interactivity, but this is due to the lack of detailed discussion with which it is identified. As might be expected with a theme relating to children, the topics emerging most frequently reflect children's interests, such as *Arts/Culture* (30%), *Museums* (28%), *Science* and *Media Content* (both at 15%). Notably however, *Education* was not a significant topic (at just 7%). This is important as the

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[22] The early years of the sample featured a significant number of references to "VIPs" or significant personalities in industry and culture, through quotations, citations or general reference by journalists. A variable was included in the codebook to measure this occurrence in the sample. However, as the coding progressed many of the names of course changed and so consistent coding towards meaningful findings was no longer possible. However, notes were still kept for references to VIPs and although not part of the quantitative analysis, they are relevant for the discourse analysis, either as discourse community leaders or even as discourse communities within themselves.

representation of interactivity as being 'child friendly' is not associated with discussions of *Education*, although it is in *Science,* a topic closely linked to education in media coverage generally (see Trench, 2007). The *Commercial* and *Pedagogical* themes circulate more frequently within the *Education* topic, suggesting that the outcomes with which interactivity is associated go beyond mere appeal to children or even educational benefits, towards other potential goals.

The most common Domain of communication where it arises is *Entertainment*, *Education* and *Heritage/tourism*. This is interesting as it suggests that this theme does not arise when the topic is education, but it may arise when the communication purpose of the reference to interactivity is education, such as in museums. The Venues most frequently found under this theme are *Exhibition* spaces and other public spaces (which include theatres) and the configurations most frequently described as "for kids" and no more, are exhibits and performances. This suggests an association between museums and the *Hula-hoop* theme. Although each article could be coded for up to four themes, the discourse analysis on the *Hula-hoop* theme selects articles that represent this theme only. Because the theme is identifiable mainly through its lack of discourse detail, the presence of other themes (having extra discourse characteristics) would further reduce the material available for analysis. Although lacking in frequency and detail, this theme's value is in highlighting the vacuum in discourses surrounding certain contexts of communication, particularly those targeted at children. Perhaps, as McLuhan (1959) noted, the hula-hoop represents the disturbance of a "cherished order of perception" by adults (ibid: p.345).

viii. Sceptical theme

The sceptical theme recorded the second lowest frequency in the thematic analysis. However, it occupies an important place in the study as the only opposing voice to the rest of the themes in the analysis, operating as an 'antagonism', questioning the ideas that other themes raise with interactivity. Many other themes are referenced alongside the *Sceptical* theme where it arises, particularly in articles containing detailed critiques of the confused state of definition of interactivity or that question its very existence. Indeed articles coded with this theme tend to deal with the concept of interactivity head on, and therefore are relatively discourse rich, as seen in the correlations of themes with relevance of interactivity to the article overall (see Table 22 below).

Relevance:	*Central*	*Peripheral*	*Incidental*
Theme:			
Sceptical	17.9%	73.2%	8.9%
Empowering	6.3%	74.6%	19.1%
Pedagogical	4.6%	68.6%	26.8%
M&M	7.5%	64.3%	28.2%

Table 22: Relevance of term to article overall, correlated by theme

Interactivity is more likely to be central to and less likely to be incidental to articles coded with the *Sceptical* theme, compared to other themes. The articles coded with this theme include those with the most frequent number of references to the research term (including the top three articles with 22, 20 and 14 references to interactivity respectively). For this reason, its analysis is important in counterbalancing the perceived weight of other major themes, which may appear more frequently across the sample but often with lower relevance to the research term, fewer per article references and producing thinner discourse material.

Only 43% of articles using scare quotes around the term were coded with the *Sceptical* theme, which is fewer than expected. However, this finding illustrates that scare quotes introduce a number of different semantic complications to a text, of which a sceptical tone is only one.

The theme was also found more frequently in articles making reference to specific instances of interactivity rather than generic references. This finding contrasts with the *Empowerment* and *Pedagogical* themes which tended to refer to interactivity in a more generic way. The most frequent specific configurations associated with the sceptical theme are *TV, www* and *CD/DVD*s, the latter supporting Winston's (1998) suggestion that the failure of the CD-Rom contributed to scepticism over the value of interactivity.

The discourse analysis focuses on specific communication events or technologies which promise interactivity but are found to disappoint, discussions around expectations compared with actual experiences, and articles which overtly explore the nature and meaning of interactivity itself to assess where, why and from whom sceptical representations emerge.

ix. Information Society Theme

As noted already, at the outset of this research, it was expected that IS discourses would be circulating right throughout the sample or at least lurking in many parts and for this reason, the sample material was coded for IS under both 'Theme' and 'Topic'. However, the IS was not a feature of coverage and as a theme, IS was the least frequently found throughout the sample, despite being a significant discourse in both the academic and public policy literature. Interactivity does not appear to arise in public discourses (at least in newspaper media) as to the same extent as it does in these other fields of practice, which begs the question why?

As well as being the least frequent theme, the articles coded with the IS theme are also the most discourse 'thin' in the sample – the few articles that address IS policy do not address interactivity in any significant and meaningful way, indicating that even among article authors there is no strong association made. This results in a low level of discourse potential because the connections between interactivity and IS policy are inherently weak, a disappointing finding from the point of view of analysis. However it highlights a discrepancy between public and other discourses which raises questions as to why interactivity has become associated with the IS in academic and public policy discourses.

The topic most frequently associated with the IS theme where it is found, is, perhaps not surprisingly, public policy and in particular, IS policy, although as noted earlier this group of articles are linked by the label IS and little else. However, the next most frequent topic under the IS theme is *Media Delivery*, which illustrates the one strong connection between interactivity and the information society theme in stories on interactive/digital television. This is also important as it supports the argument that policies linked with industry activities are more likely to be covered than policy alone.

The domain most associated with interactivity under the IS theme was *Entertainment*, while *TV* and *www* were the most common configurations, again reflecting more news interest in articles about digital and interactive television than other generic IS related policy or projects. And despite IS policy in Ireland being guided by the EU, the US appeared more frequently as a location of reference in IS themed articles.

These findings under IS topic and theme are important as they show that an assumption cannot be made that discourses in academic and public policy literature will usually make their way into public discourse through media. The discourse analysis on this theme will examine articles on both IS policy and projects to explore which aspects gain traction and why, and how interactivity is implicated in IS discourses.

6.7 Content analysis conclusions

These findings present a comprehensive picture of how interactivity features in public discourses through the print media. But it also acts as a window into coverage of media and communications in general over fifteen years, highlighting the representative value of interactivity beyond its own meaning and operation, as a marker in general ICT discourses. The coverage reflects peaks and troughs in the ICT experience from both industry and society perspectives. But the most important findings and most interesting discourse material emerges in the trend fluctuations over the sample period, the contradictions in the findings, the overlaps and conflicts in representation and what was expected but is missing in the coverage. Interactivity is featured most often in the *Business* and *Technology* genres but both these genres are intimately connected in a physical and editorial sense. The result is a style of coverage which strongly reflects business interests and readership. Indeed, the findings suggest a shift occurring during the time frame, from viewing readers as an *audience* for media content to seeing readers as *consumers* of media applications and devices. This emphasis on industry rather than reception is borne out in the voices responsible for references to interactivity and quotes within the coverage, both dominated by Media and ICT industry interests. The presence of the *Analysts* and *Advertising* communities and the relative silence of user groups in the coverage indicates some potential imbalances in the discourse.

The kinds of stories covered also show an *ICT* and *Media industry* leaning, yet significant coverage is also found in the *Education, Arts/Culture* and *Museums* topics, the latter featuring throughout the sample at levels beyond what was expected. Museums are also in evidence in the configurations, where *Exhibits* are the most frequent after *www* and *TV.* Museums coverage even triggers some new configurations in the coding – *Building/Space, Map/Guide* – as well as two new modes, *Interactivity with Objects* and *Interactivity with Space.* This suggests a rebalancing in the representation of interactivity through contributions from discourses and the communities represented in sectors outside ICT and Media. But it also suggests that museums have a role to play in the analysis of media and communications contexts generally, and in the analysis of interactivity specifically.

The museum also features in the venues for communication, with *Public* venues in general appearing far more frequently than *Private* venues. This finding is at odds with much of the literature and research into interactivity where the more influential fields of research concern individual user/machine interactions and the default context is private. Meanwhile hybrid venues and uses suggest that layered 'interactivities' may take place in public venues. In the case of museums, the layers could include interactivity with *Objects* via *Machine,* with *Other People* and within *Space.* But in relation to mobile devices the layers could entail interactivity with *Data* or *Other People* via *Machine* in private communication but within a public *Space.* These multiple interactivites within the one event raise important questions about the role interactivity plays in mediating the boundaries between different layers and between public and private communications.

Meanwhile the boundary between old media and new is addressed in the minor position of news as a domain of communication associated with interactivity. How newspapers acknowledge and report on online news media is important in the context of the shift in media practices and structures taking place during the sample period. While not frequent, discourses on interactivity in relation to online news are significant because of the role interactivity is thought to play in distinguishing old media from new. This boundary is also addressed in the understanding of interactivity as a *Characteristic of the medium* in use, the most frequent definition found in the coverage. But a turn to the interface may be underway later in the sample in the increasing depictions of interactivity as a function of *Application/Design*. These findings again allude to larger issues in media and communications research which a discourse analysis of interactivity can help to illuminate.

The user's voice is missing from the coverage, both in terms of who is being quoted and the definitions being circulated. The *Perception of Users* is not a defintion of interactivity featured to the extent that it is emphasised in the literature, while the lack of user represention in the coverage in either the voices reponsible for references or quotes, inevitably pushes instrumental rather than cognitive definitions to the fore. This results in a one-sided

perspective from participants in interactive communication, who are mainly those involved in facilitating, producing or designing for the interactive communication. This in turn emphasises particular strategies and goals which may differ from those of general users. Some goals may even relate to the representation of interactivity itself, as *Characteristic of the Machine* or *Application of design* define it as within the control of producers, while *Perception of user* appears to hand control over to users. The lack of user representation, may allow the more ideological perspectives to come to the fore.

Finally, the most frequent themes arising in relation to interactivity are *Empowerment, Commercial* and *Pedagogical* perspectives. These reflect the earlier findings on the kinds of articles in which interactivity features, the voices featuring most frequently in the coverage and the meanings of interactivity circulating. The *Information Society* and *Sceptical* themes are the least frequently found, despite their emphasis in the literature and their place in the initial selection of themes. The *Aesthetic* and *Ludological* themes are important in terms of the communication contexts and attitude to audience they display, which differ significantly from the more frequent themes. Meanwhile the *Futuropia* and *Hula-hoop* themes are new additions, arising from representations in the coverage which add an instrumental function to the *discourse* of interactivity. The *Futuropia* theme associates interactivity with unlimited visions of technology and communication, whether fiction or prediction, thereby expanding the potential fields of intertextual discourse. The *Hula-hoop* theme on the other hand limits the discourse potential by its very nature, in describing interactivity as whimsical or 'for children' and therefore of limited comprehension in public discourse.

However, regardless of frequency, all themes are important to the discourse analysis in that each is identified and found to be present to one degree or another, performing a distinct function in the overall discourse mix. More crucially, some overlap or coexist in individual articles or in relation to particular communication contexts, goals and outcomes. The next part of this study addresses each of these themes in relation to the actual coverage, as described in the discussion of thematic findings. The selection of articles and intertextual materials will be presented in order of thematic frequency, but each will deal with overlapping and conflicting themes as they arise, in order to unpick the discourses circulating around interactivity and the discourse communities associated with them.

CHAPTER 7

Discourse Analysis I:

Empowerment, Commercial and *Pedagogical* themes

This chapter is the first of three in the discourse analysis of the themes of interactivity arising from the coverage. It focuses on the most frequent themes arising from the sample, which are the Empowerment, Commercial and Pedagogical perspectives on interactivity. Each theme is briefly introduced and a discussion and analysis in relation to relevant articles selected from the coverage follows. The theme findings outlined in the previous chapter guided the selection of articles for detailed discourse analysis, along with the 'discourse map' described in the methodology outline in Chapter 5 (included in Appendix B).

7.1 Analysis of the "Empowerment" Theme

Empowerment is the theme most frequently associated with interactivity in the sample. It describes interactivity as a feature that allows or enables access, content creation, engagement and even emotional expression among users. The main article selected for discourse analysis here is highly representative of the different levels of empowerment as well as the variety of communication contexts with which the theme is associated.

"Potential of Virtual Reality about to be unleashed" – *Irish Times,* September 25th, 1998

This article was syndicated through the Guardian newspaper service and published in the *Business* genre. It was originally published in the *Guardian* newspaper a week earlier, on September 17, 1998, in an almost identical format[23]. Its appearance in the business genre, covering technology issues, reflects the noted trend in *Irish Times* reporting where technology stories were gradually moving from *Technology* into the *Business* genre. Through its syndication, the article links the *Irish Times* to the *Guardian* both physically in terms of content but also in its editorial line. This supports the *Irish Times'* effort to be an authoritative voice in technology reporting while also connecting it to wider international discourses surrounding ICT use in society.

The article uses a mixed style or format of writing - expository, hortatory, procedural and so on (after Van Leeuwen 2010) – to address a variety of topics, domains of and venues for communication across a selection of geographic locations. Various configurations of interactive communication are outlined and the word 'interactive' itself appears fourteen

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[23] See "New view to a kill" by Leander Kahney, *Guardian*, September 17, 1998 – this original article was published in full in the *Irish Times* apart from an addendum which followed it called "VR product sites" listing a number of websites readers could visit to find out more about particular applications of QuickTime VR. As these sites were not published in the sample article from the *Irish Times*, they do not form part of the analysis.

times, making it one of the more discourse rich articles in the sample. The concept of interactivity is presented as highly relevant to new developments in digital technologies, particularly in virtual reality interfaces, and the ways in which they are being used in such diverse contexts as crime detection, legal proceedings, research and education environments, entertainment and business software. This analysis illustrates why media discourses are important and how discourses around interactivity may influence political and public discourse in ways which range far beyond the immediate context of communication being addressed.

a) Setting the scene – the power of metaphors

Readers are introduced to the article topic via a *problem,* specifically the "daunting task" juries face in examining evidence at murder trials. A potential *solution* is presented in a new virtual reality (VR) system that Australian police have developed, to "walk witnesses and juries through the scene of a crime" in order to "make things easier" during criminal trials. The first reference to the research term is as follows:

> "Resembling the technology in the film *Blade Runner* that allowed Harrison Ford to navigate a flat via a photo, the Queensland Police's **Interactive** Crime Scene Recording system will be used for the first time in a murder trial pending before Brisbane's Supreme Court"

The term 'interactive' appears in the name given to the system and in this way it performs two tasks. It is descriptive – the system has interactive qualities – but it also implies the existence of a different (perhaps previous) 'non interactive' Crime Scene Recording system, which, by definition, would not have an 'interactive' quality. The kind of interactivity referred to here relates to *Empowerment* in that it 'allowed' Harrison Ford to navigate a flat via a photo in *Blade Runner*. As noted in the theme outline, to 'allow' could mean that the technology (along with other contextual elements) provides both the potential for action and the permission to act.

At first, citing the film *Blade Runner* (1982) appears to be a simple comparative device, to help readers understand how the system might work. It may also lend it a glamorous and futuristic feel, conjuring up a world where technology 'enables' the detection of crime and pursuit of justice, a reading of the film which might support a basic 'empowerment as access' version of the theme. The Esper photo analysis machine employed by Ford's character Deckard in *Blade Runner*, facilitates seemingly infinite zoom and focus capability, a feature with obvious applications in forensics. However, *Blade Runner*, set in the Los Angeles of the future in 2019, is dense with references that are regularly subjected to far more complex readings. It is said to present a dystopian vision of a technology-soaked urban world,

exposing the dark side of technological progress (Bruno 1990) and is regarded as the archetypal new media vision of the future (Manovich, 2002). Notions of justice and fair trial with a jury of peers dispassionately examining evidence do not sit comfortably with this interpretation.

The article states that the technology empowers Harrison Ford the *actor*, rather than Deckard the *character*, Ford being perhaps more familiar to 1998 readers as a hero of the recent Indiana Jones trilogy. However, in 2019, he works for security forces in the pay of powerful corporations using technology to control or 'retire' replicants (bioengineered androids), a more complex kind of empowerment than mere access. Photographs play a crucial role in the film beyond facilitating virtual access. They have status as quasi-legal documents, which by challenging both memory and reality, impact directly on the fate of replicants and the protagonist. Allusions to Barthes, Lacan and Foucault have made the film a staple in postmodern cinematic analysis, even a "metaphor for the postmodern condition" (Bruno 1990:62).

Power is a central theme in the film but it is not clear if the article author is aware of this discursive link. A more utopian example from the science fiction genre of film and television could have been used with similar metaphoric effect, e.g. the holodeck in *Star Trek*. But by invoking *Blade Runner* in a discussion of interactive technologies, the writer irrevocably links it with the assumption of 'threat', so pervasive in new media concepts and discourses (Poster 2002). The question of who ultimately holds power, beyond the communicative event of examining crime scenes during trials, becomes central.

It is unclear who is behind the comparison to *Blade Runner*, whether this was an expository tool used by the journalist, whether it came from Apple whose technology was licenced for the system, or if it came from the Queensland police who are credited with creating the system. If the journalist, it is most likely to have been used for the visual properties such a reference holds, despite the discourses it invites as outlined above. If it came from Apple via marketing materials for example, it would most likely be used for its metaphoric qualities but also to perhaps align Apple with the creative potential for complex future technologies (see *Futuropia* theme analysis). However, if the reference came from the Queensland police officers credited with devising the system for law enforcement uses, this raises more questions about its appropriateness. Their understanding of interactivity as represented here suggests it could have significant impact on legal procedures and outcomes.

b) Technological and state empowerment

The same sentence that begins with *Blade Runner* ends with details on the system's debut at a murder trial which, as well as providing a news hook for the article, lends an evaluative note to the 'interactive' technology. If an Australian state Supreme Court has accepted its use, then

by implication it must be robust and capable of withstanding legal scrutiny – in other words, it works. The technology has empowered users but also has empowered an institution of the state in the exercise of its authority, which in turn endorses the technology.

In general, public statements by police organisations (at least in developed democratic states), would be aimed at reassuring local and visiting communities that all efforts to enforce the law and protect citizens are being made. There might also be an attempt to position the force at the forefront of technology use and diligence and creativity in solving crime. But this was a particularly pertinent issue in relation to the trial cited in the article, in which the technology was to be used for the first time.

A 16 year old youth from Cairns, Queensland, stood accused of the brutal murder of a young female Japanese backpacker in a case that made headlines for many reasons, not least the conduct of the police during the investigation[24]. Public authorities were extremely concerned about the impact of the crime on the Queensland tourist industry, because Japan represents a signficant inward market[25]. As a result, there was political concern and pressure to appear speedy and decisive in the investigation and prosecution of the crime (see Mason, 2006). The use of technology was central in this regard, particularly in convincing a Japanese audience that Australia was safe and that its legal system was the most modern in existence. Considering that the murder sent shockwaves throughout political, legal and social circles, the intense focus on interactive technology in discourses around the case appear to be an effort to empower not just users and the courts, but society in general against the wider ramifications of crime in Australia.

The article next explains how the technology, based on Apple's QuickTime VR, actually works. A police officer "takes a series of crime-scene photos" and another "stitches them together into navigable panoramas". This almost domestic description of the process serves to divert readers from the grisly details the images might depict, which were not detailed in the article[26]. The author compares using the system to "being inside a photographic cylinder" allowing a variety of actions - 'left to right', 'up and down', 'zoom in', 'jump from one..to another'. Ultimately, the result is said to give "you [the user] the sensation of walking through

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[24] The Queensland police stated that the accused had been moved to a high security holding facility in Brisbane, but a local press photographer provided photographic evidence that the accused was still being held locally. See "1998" at http://www.briancasseyphotographer.com/awards.php [accessed May 16, 2011]
[25] See Mason (2006). Some of these concerns were reported in Australian newspapers at the time such as "Violence against visitors hurts safe image", *Sydney Morning Herald,* October 14, 1997 and "Japan turns on Australia and Cairns victim" *The Age*, October 25, 1997 which reported that Australia had been presented as "an increasingly violent and racist country with a growing dislike of Asians" in the Japanese media. A decade after the murder, this was still a concern, as reported in "Leaders recall binding relations" in the *Cairns Post,* September 22, 2007
[26] The victim was lured to a warehouse, beaten to death and then days later her body was dumped in a bin and wheeled several kilometres to a swamp area where it was buried in a shallow grave, as reported in "Tragic end for the woman with a dream" by Greg Roberts, *The Age,* October 11, 1997.

the crime scene". Through its interactivity, the technology has empowered users by assigning them status as legally authorised crime scene investigators[27].

The procedural writing style employed here serves two purposes. First, it helps explain how to create and use a virtual reality system, which many readers might be unfamiliar with at this time[28]. Secondly, it demystifies the technology, serving the wider expository aim of the article. Ease of use and transparency of operation empowers potential future users when confronted with a similar technology. Official documentation on this technology adds the following details:

> "The **interactive** scene can also have embedded in it further aids to understanding of the case such as still photographs, video footage, plans or animation. The technology renders superfluous the need to tender hundreds of still photographs. It enables the court to easily get a clear understanding of the layout of the scene and the relationship of evidence such as forensic evidence to the scene. It also greatly facilitates the giving of evidence by witnesses since they can refer to the scene image as they are giving their evidence."[29]

The interactive technology produces an "interactive scene" so that users can orientate and immerse themselves in it with opportunities to engage with multimedia data. This is not a crime scene reconstruction in the sense of attempting to ascertain the role of evidence or the sequence of events to test a hypothesis. These details are already "embedded", within the creative digital process, in its representation of the "layout of the scene" and the "relationship of forensic evidence" to it. The interactive scene presents not just what might have happened but something much closer to fact. Further, the assertion that still photographs are "superfluous" suggests that digital (and moving) images have a higher value in presenting forensic evidence. Yet the document later acknowledges the superiority of SLR film cameras in capturing high resolution detail, particularly for blood splatters. A technology like the Esper photo analysis machine in *Blade Runner* was not possible at the time as digital capture quality was not able provide the data required for such near infinite zoom. So rather than being a characteristic exclusive to digital technologies, interactivity at least then still required analogue data quality to maximise its potential[30].

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[27] A 'CSI effect' has been examined in studies into jurors exposure to CSI style television programmes and expectations of scientific evidence or ICTs used in trials. Results suggest the effect is mixed and may be part of a broader 'tech effect' from popular culture in general (see Shelton et al, 2006).
[28] VR accounted for just 1.3% of interactive configurations in the sample overall.
[29] A detailed overview of the Queensland Police ICR system was given in "Technological aids to prosecution", presented at the Australian Institute of Judicial Administration 'Technology for Justice' Conference in 2002, available at www.aija.org.au/tech3/presentations/technologicalaids.pdf
[30] The level of detail available in a photographic image depends on a number of criteria at the point of capture common to both digital and analogue film including exposure, optical quality and the characteristics of capture medium (sensor or film). Until recent years, film could natively capture more data than digital depending on fine grain and chemistry used in development. However, sensors and chips in digital cameras have developed to compensate, now often surpassing the detail possible with film (see Rudolf, 2006). In 2011, 35mm SLR digital cameras can capture images of up to 21 million pixels in size, although larger sizes are possible with medium format cameras. Scan back digital cameras can produce multiples of this, although this style of capture is only suitable for still scenes, similar to plate camera photography of the 19th and early 20th centuries.

c) It was the jury in the courtroom with the joystick

> "To make navigation of the panoramas easier, they are incorporated into an **interactive** document resembling a Cluedo board; on one side is a map of the crime scene, with hotspots linked to the panoramas…Click on a hotspot and a photo of the evidence appears in a window to the left."

The interactive document makes navigation easier, linking interactivity with ease of use and minimal action for maximum effect. This quality reduces the effort required and even the need to understand cause and effect – users are empowered to do small things with potentially great rewards. With no further detail given, the interactivity appears magical, representing an ultimate level of empowerment, but alluding to a quality of interactivity much criticised in the literature (see Aarseth 1997).

A reference to another icon of popular culture – the boardgame *Cluedo*[31] – helps readers visualise the interface of the software under discussion. Utilising familiar structures to navigate unfamiliar terrain is a staple strategy in interface design. However, this reference is more than just descriptive. It also implies the potential for strategic action and even fun, albeit within the constraints of a set of rules in game play, thereby introducing a minor ludological theme in support of the major empowerment theme. "It places the jury at the scene" says one of the police officers, reflecting a shift in the relationship between participants and the technology and context within which it is used. The jury are now players in a game, immersed in the flow of forensic data.

In a game of *Cluedo*, all possible solutions to the crime of murder are contained within the game being played, the point of which is to solve the crime by deduction and identify the murderer[32]. The same cannot be said of a murder trial. Utilising the Cluedo metaphor suggests that interactivity turns the trial into a kind of game. This turns a complex and potentially open-ended event in which all facts are not known, into a closed puzzle with a correct solution. The "players" (juries, police etc.) are empowered to find the solution using the interactivity of the technological tools available. But the game play metaphor has an impact on the greater context in which it sits beyond the screen interface. Interactive technologies, the article suggests, can empower users both to solve the crime and to win the game. Thus, the 'empowerment' theme goes beyond enabling mere access to and presentation of information but permits users to become players with increased power over content and potential outcomes of communication.

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[31] *Cluedo* was originally published by Waddingtons in 1949, and acqured by US toy company Hasbro in 1993.
[32] The number of possible outcomes was 324 until 2008 when a revised and updated version of the game introduced more characters, weapons and rooms, raising the possible number of outcomes to 468 – see "Jack Mustard in the spa with a baseball bat", *The Guardian,* December 20th, 2008
http://www.guardian.co.uk/lifeandstyle/2008/dec/20/cluedo-new-rebrand-family

However, interactive media could also have empowering effects for those with an interest in trial outcomes, particularly in controversial criminal cases. Media technologies have been observed to be highly effective with juries in criminal trials and are valued particularly by the prosecution in adversarial legal systems, particularly where there is a lack of physical evidence[33]. Indeed the use of media technologies in criminal investigation has a long history as do concerns over its objectivity and potential for interference[34]. Such concerns were also raised in the Australian media with direct reference to the Queensland police system and the Cairns murder in 2003, when it was proposed to adopt the system in the state of Victoria[35]. However, readers of this article were not exposed to such concerns.

This representation of the empowerment aspect of interactivity raises questions about the use of digital media technologies in forensic science, the potential for and effects of manipulation of digital images during the investigative process, the persuasive impact of multimedia particularly in jury trials, and the place of digital technology overall in the judicial process. The discourses found in this article originate in Australia, which would be comparable for readers to the UK and Ireland, in terms of its legal codes but also in political and civic culture. Indeed, the Australian approach to forensic technology has been of interest to both Irish and UK police forces who have visited Australia to see these systems in action[36]. Two weeks after the publication of this article, an opposition TD asked the Minister for Justice in the Dáil if his department was aware of "Queensland police's **interactive** crime scene recording system which will be used for the first time in a murder trial in Brisbane Supreme court" and whether the system would be introduced here[37]. The similarity of the description to that given in the newspaper article indicates how easily discourses around interactivity can travel between media, legal and political institutions. The minister replied that the Garda were looking at it within the next stage of their IT strategy[38]. But by 2005, a report commissioned by the Department of Justice into forensic science needs in Ireland indicated that the potential for such a system was still some way off (see Kopp, 2005).

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[33] Carney and Feigenson (2004) examined a high profile US murder case in 1975 which was reopened and brought to trial 25 years later with the help of a 'highly customised interactive multimedia evidence presentation system" securing a conviction. Robert F. Kenndy Jr, a cousin of the convicted man, is cited stating the "multimedia system convicted Michael [Skakel] in the end". Questions of subliminal messaging and direction of the jury were raised in relation to the multimedia presentation. H'owever the authors note that while the issue of how juries examine interactive evidence in the jury room has not been adequately thought through, the "effectiveness of high tech presentations does not make them unfair" (2004:p.33)

[34] For example Alphonse Bertillon introduced standardised or 'metric photography' to the criminal justice system in Paris (and is credited with inventing the 'mug shot'). His 'technology' was adopted by police systems in the UK, US and elsewhere. See US National Library of Medicine Biography of Bertillon at http://www.nlm.nih.gov/visibleproofs/galleries/biographies/bertillon.html

[35] See "Avoiding the dangers of virtual justice" Editorial, *The Age*, May 9, 2003 available at http://www.theage.com.au/articles/2003/05/08/1052280376157.html [accessed May 11, 2011]

[36] As reported in "Keyboard Cops" by Kirsty Needham (also the author of the original *Guardian* article) in the *Sydney Morning Herald*, October 24, 1998.

[37] Opposition TD John Gormley (Green Party) posed the question to Minister John O'Donoghue (see "Written Answers – Garda Technology", *Dail Eireann Debates* Vol. 494, No. 5.

[38] Police Using Leading Systems Effectively (PULSE) is the IT structure used by the Garda Siochana. Since initiated in 1999, the system has been the subject of ongoing difficulties and controversy over costs, as reported in "Call for probe into garda record system" by Cormac O'Keeffe, *Irish Examiner*, March 21, 2005.

d) Diffusion of empowerment across other fields

The article moves on to discussion of other uses of similar 'interactive multimedia' technologies, whose 'potential has not begun to be realised'. Canadian scientists claim VR will "revolutionise micropalae-ontological illustration", a prediction unlikely to get general readers very excited, but indicating that the science community values the empowering effects of interactivity. They carry an authoritative voice in terms of news value and discursive impact because science output is considered inherently valuable (Latour 1987, Sturgis & Allum, 2004). This links the empowerment discourse to discourses on the value of the production of knowledge and science in society at large, adding extra dimensions to what interactivity can empower users to achieve.

The next reference moves the discussion on to the current state of adoption of 'interactive' technologies in the field of entertainment:

> "**Interactive** media at the moment is like the early days of cinema when they took stage plays and filmed them head on," says Joel Canon, owner of **Interactive** Photography, based in San Jose, California. "Movies have become a very powerful medium. People have to learn how do this with **interactive** media."

Commentary has moved on from Australia, via Canada, to California, and San Jose, the home of Silicon Valley and hub of new media innovation. The quote provides a perspective on empowerment from a business, which is 'interactive' by name, a common feature of company titles at this time, as noted in the quantitative findings. The speaker is not just a representative, but 'owner', implying substantial investment in the field and its future potential. The comparison to cinema, now a 'very powerful medium', from an area long associated with the film industry, carries weight and implies similar potential for interactive media.

The current deployment of interactive media is dismissed as mere baby steps. The obligation is on 'people' (it is unclear whether this means industry, users, or perhaps even society) to learn how to maximise this power. This shift from the hortatory use of 'you' in describing users of the Queensland police VR system, to the more generic term 'people' raises questions as to whether this is an issue of media literacy amongst the general population or within the industry itself. It reflects a common discourse trend, which tends to place new media on a long line of evolving technologies, which have presented challenges and opportunities for industry and society (Pavlik, 1998). This trend would be described the following year as 'remediation' (Bolter & Grusin, 1999). The empowerment potential here appears to go beyond the immediate context of a communication event involving power of access or

content creation and display, but the empowerment of a whole industry or sector of society engaged in its use. It also introduces a minor commercial theme in support, by associating the power of a medium with the power to create an industry with economic benefits, potentially comparable to the cinema industry.

The article next visits Rhode Island and the field of education, where academic endorsement is given to the empowering aspects of the technology:

> "One of the areas in which **interactive** media may have a significant impact is education. Just as museums are turning to hands-on displays that teach through exploration, educators are deploying the software equivalents, called **interactive** illustrations, or exploratories."

Here, power resides in the hands of 'educators' using interactive technologies to teach or aid exploration. But the 'hands on' approach gives power of access to those learning, with potential for further empowerment once knowledge is attained. The theme is lent theoretical support, in an expository style, by a quote from an academic expert on interface design, (cited also in the literature review in relation to HCI theory):

> "(Exploratories) are based on Piaget's constructivist theories of learning; learning by doing, learning by being engaged," "It's the discovery method of learning." People have a faculty of graphical intuition, Prof van Dam argues, and things are seen more clearly if they are represented graphically. "If a picture is worth a thousand words, a moving picture is worth a thousand static ones and a dynamic picture that you can **interact** with is worth a thousand movies."

This overt reference to constructivism alludes to the pedagogical theme, another of the more dominant discourses around interactivity both in the literature and in the sample, outlined further in this chapter. Here the empowerment theme associates interactivity with the acquisition of information through engagement with 'powerful learning tools', particularly visual information. The interactive moving image is considered more powerful than a still image, supported by the static vs. dynamic discourse. This theory has echoes in the value placed on moving images in presenting crime scene details at trial, as noted earlier. The quoted party is the teaching rather than the learning participant in the education context, so the value of interactivity is in the attractiveness of engaging teaching materials rather than proven learning outcomes. The use of multimedia in criminal trials has triggered concern over the apparent effectiveness of such presentations in securing convictions, by leaving juries in no doubt as to the 'facts' of the evidence. Similar concerns could be raised about whether interactive technologies impact on the potential for critical thinking in the classroom, an issue addressed further under the pedagogical theme.

Completing the family of communication contexts from civic to entertainment to education, the writer turns to interactive technologies in business communication and software design:

> **"Interactive** media may also influence the design of software and computer
> interfaces. Many decry the current state of the art; Microsoft is among them. "We
> believe that in the next generation of business applications we will use multimedia
> more and more," says Mr Eric Engstrom, Microsoft's general manager of multimedia.
> "Information will be presented visually in the form of **interactive** illustrations. The
> goal is to bring multimedia to business applications and eliminate the learning curve."
> To that end, Microsoft last month launched Chromeffects, a technology for creating
> **interactive** multimedia and delivering it over the Net. According to a white paper
> that accompanied the launch, software will gradually begin to resemble other means
> of mass communication such as films, TV and radio. Among the methods proposed
> are **interactive** 3D interfaces."

This paragraph presents the empowering qualities of interactivity in a number of ways. The
implication first is that 'interactive media' are not native to the software development
industry. This seems unusual as interactivity is frequently described as emerging from the
fields of HCI and CMC in computer science (see Heeter 1989, Suchman 1989 etc.) Here
however, 'interactive' is paired with the term 'media', and the association is very much in the
entertainment rather than computational sense.

Being responsible for much of the 'state of the art' in software and computer interface design
due to sheer market penetration (in 1998), Microsoft is presented here paradoxically as a
champion of improving design in interactive technologies. But this is not the contradiction it
seems. Microsoft was adopting a deliberate strategy to move away from computer science
discourses and associate itself more with interfaces and content, reflected in the phrase
'content is king', used by Bill Gates not long before (see Gates, 1995). Here interactive media
are again empowering beyond immediate communication events, by becoming the dominant
paradigm in interface design discourse. By adopting the media 'characteristic' more
associated with entertainment, the software industry is empowered by the potential
transformation in how they communicate.

As with the Cluedo interface, the goal is to 'eliminate the learning curve', to make things
easier. Then 'we' will be empowered (it is unclear whether this means Microsoft, general
users or wider society…) by interactive technologies, by having to do less to achieve more.
Participants in interactive media are no longer 'you' or 'people' but 'we' – all of us, together
with Microsoft. Finally, with a new 'technology' (i.e. product) for 'creating interactive
multimedia', users have the power of access, content creation and, through 'interactive 3D
interfaces', the engagement and potential for expression that other mass media offer.

e) Diffusion of innovation

This article presents interactivity according to a diffusion of innovation model, in its adoption
across different fields of practice (see Rogers 1995, Winston 1998). Rogers' five
characteristics that explain why an innovation might be adopted over another, are each met by

the various examples: 'relative advantage' (in terms of ease of use), 'compatibility' (with current systems and contexts) and 'complexity' are explored in the crime scene system example, while 'trialability' and 'observability' reflect a scientific and positivistic approach to innovation, addressed by the endorsement from scientific and educational communities. The commercial sector outlook represented by Microsoft implies that fields of practice are converging in ICT use and style – diffusion is almost complete.

A dissenting view is included in the final paragraphs, from an "**interactive** design" consultant, Jakob Nielsen, a significant commentator and author in the arena of digital interface design whose study on usability published shortly after this article's publication, was to become a standard text in multimedia studies and practice (see Nielsen, 1999). Nielsen acknowledges the important role that interface design plays in maximising the potential of interactive technologies, but suggests it is still underdeveloped. Empowerment is not merely enabled by interactivity as a characteristic of the technology, but as an application of design and production that uses the technology. The irony is that the main tool required and used by designers to improve the design of computer interfaces, is the computer interface itself.

f) Channels of empowerment

Two further articles are included in this analysis, which represent aspects of the empowerment theme that emerge later in the sample. Both articles describe the impact of the September 11, 2001 attacks in the US on online news and assess how websites fared in reporting on it. Both also note how coverage of the attack highlighted the 'merits' of the Internet, one of which is the empowering features of interactivity. These articles are important because they reflect coverage by a newspaper of online news. As noted in the findings this was not a frequent domain of communication associated with interactivity, but is an important boundary where interactivity operates for discourse analysis.

Article 'A' is supplied again by the Guardian Service where a London correspondent elicits the views of some online editors of major news websites about how they coped, both emotionally and professionally, with the event[39]. Article 'B' is an analysis by an *Irish Times* reporter of the international online news reaction, but also the *Irish Times* web site performance. It triumphantly claims to have had 'Ireland's first online report on events', six minutes after the first plane hit the first tower[40]. Both articles, published in the Computimes section of the paper, contain comments from online editors about how their coverage excelled in various respects, some using it even as an opportunity for self promotion. For example, article A quotes the editor of Sky News Interactive (sic) as follows:

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[39] Article A: "Online editors pushed to the limit", *Irish Times* September 24, 2001. The original and identical article was published as "When the web came of age" by Owen Gibson, in *The Guardian*, September 17, 2001.
[40] Article B: "Reporting terror on the Net" *Irish Times* September 24, 2001

> "It was a real achievement from a Sky News point of view; we truly dealt with the story across online, the rolling news channel and the **interactive** service. It reinforces the message that we're the number one channel for breaking news stories."

Here, the reference probably relates to interactive television services, where users could access more information by pressing the 'red button'. While it can represent a certain level of empowerment through access, interactive television is generally regarded in this analysis more as a transaction, particularly when invoked by an industry representative in a hortatory style. This is more reflective of the commercial theme, discussed later in the analysis, which here supports the access element of the empowerment theme.

The impact of the attacks on newsrooms was manifold but was felt particularly from a technical perspective. The sheer scale of the event and the subsequent requirement for instant information from all over the world placed enormous pressure on servers running the web sites. Technical issues dominate the discourse in these articles, as the intense web traffic broke all known records – "CNN reported 9 million page impressions per hour" (B) – causing sites to crash or 'topple over' as the editor of ITN New Media put it in rather unfortunate terms (A). A direct impact was also felt as many sites servers were located in Manhattan and were damaged. But overall, the online media were seen to have risen to the challenge, providing coverage and communication with audience in ways the broadcast and print media simply could not.

The main reference to interactivity in Article B encapsulates the level of empowerment afforded:

> "The BBC invited readers to put questions to its correspondents around the world, who then endeavoured to share their insights. Such **interactivity** represents another aspect of the internet's enrichment of the media environment. Whether it was providing quick answers to specific questions, or allowing for the voicing of views and emotions, the web channelled a phenomenal outpouring of humanity last week."

This 'channelling' represents a level of empowerment that goes beyond mere access, content creation or a sense of engagement but facilitates collective expression, not just of one 'users' voice but of an entire community or 'mass' in an almost unique way. A key extra element of this level of interactivity for online news, is represented in a reference from Article A, quoting the head of content at ananova.com:

> "The web is also much more **interactive** than TV and complements it well. Our readers were a prime source of information. We've got a big following in the US…and we were getting eye-witness accounts and digital photographs within minutes."

Apart from being a defining difference between the web and TV, interactivity empowers users to contribute content not just as an addition, but as a 'prime source' which is a significant journalistic admission. This content is produced by the mass and for the masses and its provision in response to an outpouring of emotion shows how interactivity inverts the sender, message, receiver relationship traditionally observed in news. Unlike the mass media of old who broadcast or publish *to* the masses, interactive mass media here empower communication *from* the masses. The online news producers emerge as technical facilitators channelling this content to sites for both production and reception. But, lest they appear excluded from the process, the online news people are also empowered in different ways, as expressed by the commercial director of ITN New Media (UK) in Article A:

> "The **interactive** elements, audio and video, were extremely popular…There was an unusual feeling of cooperation between broadcasters and sites; everyone was united in getting the news out and giving people as much information as possible."

So a certain level of collegiality emerges, from the devastation of the event itself of course, but also facilitated by the interactive nature of the media. Yet the role of the media is changing, acknowledged in Article B by the editor of the *Irish Times* own website in relation to their coverage, who stated:

> "…there was so much information coming in and so much emotion that it would have been easy to sensationalise or sow confusion."

This is an admission that the empowering aspect of interactive media also carries both a responsibility and a workload for media professionals in terms of dealing with its 'potential' for communication both to and from the masses. However, research into online journalism in Ireland over the following years, shows journalists remained cautious about change and the transformative potential of interactivity in news media (see O'Sullivan, 2005). The changing nature of journalism and news production, with the diffusion of interactive technologies throughout all media and communications, is closely bound up with the empowering aspects of this technology visible in this article. Understanding how the empowerment of interactivity operates at different levels in both individual communication events as well as with mass communication phenomena is important if both the news media and society are to understand their role and capitalise on this enrichment of the technological environment.

g) Conclusions on the Empowerment theme

The *Empowerment* theme operates at various levels in the coverage. Interactivity 'allows' participation in communication and enables complex goals to be achieved with simple

actions. But it also gives rise to wider potential for action where groups and sectors of society are collectively empowered. The theme is effective because it is difficult to argue against the empowerment of users/participants, (although some potentially negative effects of empowerment do arise in the analysis of other themes). For example, the channelling of community via the internet is presented as empowering for users but also for journalists and possibly society as a whole. Interactivity reflects the shifting boundaries and relationships between senders, messages and receivers, empowering online news to compete with television while allowing a newspaper to comment qualitatively on online news and to be a online news publisher itself. It therefore acts as a boundary object for media practitioners, drawing together both online and offline journalists, publishers and users in the goal of understanding the new media paradigm.

But interactivity is also represented as a diffusion of innovation experienced across many other different sectors. It is defined as a characteristic of technologies, with a determining effect on outcomes in a wide variety of civic, professional, educational and social domains of communication. This in turn introduces a wide variety of discourse communities, whose own 'construals' of interactivity are depicted, such as science and HCI academics, online journalists, global ICT providers, media industry entrepreneurs and digital media consultants. Each utilise other themes – *Pedagogical*, *Aesthetic*, *Commercial* – to depict the particular empowering effect for their field. However, the discourse community of police officers is particularly notable, not merely representing a group at the forefront of technology in crime detection but signifying a society's attitude to law enforcement in general. Their construal of interactive technologies as 'easy to use' and empowering for juries and prosecutors, illustrates how the impact of the representation of interactivity can go far beyond a single communication event. The direct reference to this discourse community in the Irish parliament shows how easily such representations can reemerge in political discourse. It suggests that unexpected discourse communities, representing atypical communication contexts, may be behind the the more challenging discourses in circulation.

Finally, this theme is associated with a 'technology in business' or 'technicist' style of writing, which uses a mixed format (expository, procedural and hortatory often within the same paragraph), to achieve multiple outcomes. This strategy allows for the general exploration of interactive technology while addressing its role within society, explaining the detail of how it works while also 'selling' its potential, even selling a specific product. This style is indicative of the converging paths of the *Technology* and *Business* genres, noted in the content analysis, and an emerging 'technology in business' discourse community of journalists.

7.2 Analysis of the Commercial theme

The *Commercial* theme focuses on the role interactivity plays in business and was found in almost one fifth of all the articles. It emerges in coverage of new technologies that are revenue generating (e.g. interactive television), as a marketing tool communicating a brand or idea (e.g. interactive advertising), or as a feature of new business strategies (e.g. e-commerce). The coverage selected for analysis links interactivity with all three of these aspects of the business case, through a number of strongly representative threads and articles.

a) Interactive television thread

Interactive television has been around as a concept since at least the 1950s, and as noted in the literature review, discourses around it have been marked by 'reality vs hype' frames (Kim & Sawhney 2002). By 1995, the internet revolution had the international technology industry torn between whether the television set or the personal computer would deliver what Gates (1995) described as the 'interactive market'. The high cost of hardware and cabling, the structural complexity of delivery and scepticism within both the technology and broadcast industries about the business case, stalled progress on interactive TV. This is where one of the earliest articles in this sample emerges and sets the scene for where interactive television was at in 1995. It introduces the major industry discourses of the time and is strongly representative of the commercial perspective on interactivity:

"Saddle up the mouse for a trip on the superhighway" by Frank O'Mahony, *Irish Times,* September 15, 1995

This article author, a former Apple employee based in California, contributed a series of 'letters from Palo Alto' to the *Irish Times*, providing an international perspective for Irish readers on the latest developments in technology, directly from Silicon Valley. The article is written as a reality check on the 'information superhighway' and comments on progress with interactive television, suggesting its future lies with the desktop computer and not the television set. Many of the major discourses of the day around technology (and for long after) are invoked, such as the 'information superhighway', 'convergence' and the 'hype vs reality' issues associated with interactive television and other applications. The first reference to interactivity is with the introduction of one of the many media and technology industry representatives mentioned in the article:

> "...Larry Ellison, the self-styled richest man in California, the head of Oracle Corporation and one of the West Coast's most articulate proponents of America's **interactive** television future"

Ellison supported of the concept as Oracle was involved in the development of set top boxes for the interactive television industry[41]. However, Ellison's personal wealth is presented ahead of his company affiliation, implying the value of his opinion is as much based on his wealth as position in industry. Indeed throughout the sample, the personal wealth of various technology and media entrepreneurs is frequently the dominant descriptive tool, indicating a particular value within the media on commentary from individuals who have made substantial fortunes from technology rather than having created innovative products or services[42]. Ellison is introduced as one of a "band of information highway visionaries", including then Vice President Al Gore, "cable mogul" John Malone (of TCI cable) and "Bell Atlantic chief" Ray Smith. The style of reference – 'head', 'mogul', 'chief' – carries a slightly irreverent tone while encapsulating, along with 'vice president', as many varieties of leadership style and control as possible, implying a vision that was strong enough perhaps to attract such a varied group. This overlexicalisation simplifies the story, producing an image of a united band of horsemen on the highway in pursuit of a vision, rather than the complex process of driving a merger of industry and government interests into unknown and expensive terrain.

Vice President Al Gore is credited by many with coining the expression 'information highway' as far back as 1979 although Nam June Paik had proposed the idea of an "Electronic Superhighway" to the Rockefeller Foundation as early as 1974[43]. The metaphor came to describe the communication revolution created by the emergence of the internet and its connection with the deregulation and opening up of telecommunications and cable industries all over the world. It was known officially in the US as the National Information Infrastructure, where it was predominantly a private sector affair – "We're the guys building it...five hundred channels of interactivity," John Malone had stated, claiming that with the help of Bill Gates it would be complete by the end of 1996 (Kling, 1994).

The European equivalent of the information superhighway on the other hand was more a public vision of the 'building of an information society' (Burgelman & Servaes, 1996) than the private industry convergent network which was being laid out by this band of visionaries in 1995. The 'information society' (dealt with in more detail under the *Information Society* theme) was first officially described in the 1994 Bangemann report as a vision for 'new ways of working and living together'[44]. But it was also regarded as a continuation of a policy which

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[41] After a failed attempt to compete with Microsoft in pursuit of network computers, Oracle decided to focus on set top boxes, as reported in "Time your attack: Oracle's lost revolution", *Wired,* available at http://www.wired.com/magazine/2009/12/fail_oracle/all/1 [accessed April 11. 2011]
[42] See *Futuropia* theme and reference to "SOFTWARE BILLIONAIRE Bill Gates…" in "Microsoft, NBC to link up" by Reuters, *Irish Times*, December 12, 1995
[43] See Fluckiger (1996) and Case (1998). Case also suggests Gore may have adopted the term from a series of articles from 1970 on cable TV issues in the US. However Paik's proposal was published as *Nam June Paik. Werke 1946–1976. Musik – Fluxus – Video*, Kölnischer Kunstverein, Cologne, 1976, see http://www.medienkunstnetz.de/source-text/33/
[44] Bangemann, Martin (1994) *Europe and the Global Information Society,* Recommendations to the European Council, Brussels

sought to help EU technology and communications industries compete with the US and others (Garnham, 1996).

Industry representatives and policy makers use such large metaphors to simplify how big ideas work. The 'information superhighway' is one of the best known and represents how grand metaphors assist in the acceptance of new ideas and technologies (Sawhney, 1996). However, its strength is in its ambiguity in allowing different interpretations (Dutton et al. 1996) and perhaps is more properly described as analogy rather than metaphor (Case, 1998) The grand metaphor phenomenon is a staple at the large salespitch style conferences frequently held by the technology industry, whose impact tends to be defined (at least by media) in terms of the one big idea unveiled[45].

Case (1998) describes the concept of the information superhighway, and its adoption and interpretation among various interest groups in the US and internationally, as a particularly good example of the role discourse plays in policy making. He identifies a 'policy elite' of personalities from industry and politics associated with the promotional vision of the National Information Infrastructure (NII) in the US – and the deregulatory position in particular – who are "frequently discussed together in documents" (1998: p.387). This elite group includes John Malone, Ray Smith and Al Gore along with Bill Gates and John Sculley (mentioned later in the article) a group of 'institutionally privileged speakers' whose serious speech acts have social consequences for all (Frohmann 1994, cited in Case 1998). This article illustrates how journalists and commentators contribute to the privileging of these voices, by citing them individually with frequency but also collectively, therefore reinforcing their shared 'vision'[46]. These discourses may then gain extra currency for readers in Ireland as the Irish response to the vision of a European or global information superhighway was considered relatively reactive and limited at the time (see Preston 1996).

Much of this US elite were heavily invested in the success of the highway and in particular one of its termination points in the home, interactive television. The article goes on to draw a picture of the bright new future that interactive television as 'information machine' was supposed to provide and the 'wonderful transformation' that would occur with the mergers of phone, cable and tv companies. These business mergers are presented as a reflection of the inevitable 'convergence' of industries. The vision of convergence presented is attributed to the author's former employer, John Sculley (CEO of Apple), who frequently described the idea in his favourite "blob chart presentation". The Apple CEO was strongly associated with discourses around 'convergence' from the 1980s and is thought to have been influenced by Nicholas Negroponte whose own presentations, as noted in the literature review, were influential on perspectives at the time (see Gordon, 2003). This structural view of

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[45] As described in "The internet is over" by Oliver Burkeman, *The Guardian,* March 15, 2011 available at http://www.guardian.co.uk/technology/2011/mar/15/sxsw-2011-internet-online [accessed March 15, 2011]
[46] See frequency of references to 'VIPs' in content analysis.

convergence, aligning it with corporate strategy, differs somewhat from Gates' (1995) view of convergence as a kind of agreement on technological platforms.

b) An intertextual view from the Economist:

The frenzy around convergence in relation to interactive television was interrupted when experimental trials among viewers were suspended, as the author notes:

> "After an **interactive** TV trial in Rochester New York was halted, the headline in the *Economist* magazine was "The citizens of Rochester saw the future and yawned". The industry had yet to develop a "killer application" that would entice consumers to part with their money. Secondly, transferring hype into reality proved very difficult..."

By misquoting the *Economist* article, the author transposes the term 'people' into 'citizens', perhaps subconsciously conveying a European 'information society' style subtheme, implying that the trials were for testing the social benefits as much as to prove a business case[47]. However, an intertextual analysis of the *Economist* article shows it described a distinctly passive group of consumers – "the potatoes of Rochester" – who were "curiously unimpressed" with interactive television. The trials had highlighted problems with the concept not least the immense cost of implementing interactive TV with an as yet uninterested public. But the main problem concerned the definition of interactivity itself which the *Economist* attempts to explain:

> "Their networks are generally one-way (i.e. the customer cannot send a message back) and they have no switching systems for **interactivity**. Yet they do have one great advantage with a relatively small amount of upgrading, their cables can pump torrents of digital data into the home. That is not real **interactivity**; having received what the cable firm sends him, the customer cannot send anything (such as a request, an order or a question) the other way. But for many customers, it may be enough. The reason is a trick called "near video-on-demand".

This 'near video on demand' (NVOD), a cheaper alternative to interactive television, required a much lower level of upgrade to the cable networks:

> "It is the commercial appeal of this cheap pseudo-**interactive** market that has encouraged most American cable companies to upgrade their cable networks, even though fully **interactive** TV is yet to prove its commercial worth."

This technical definition of 'full' interactivity as a two way network rather than 'pseudo-interactivity' as one-way with limited options, is the same definition which emerges from

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[47] The title was actually "How the people of Rochester saw the future and yawned", *The Economist,* February 25, 1995.

cable suppliers entering the internet services market in Ireland two years later. An article from the sample from 1997 quotes an Irish cable company spokesperson as follows:

> "…while the network is not currently **interactive**, Internet services can be provided by Cablelink via TV cable, but dialling up via the telephone line."[48]

The same article also cites the cost of cable upgrade as the main stumbling block to providing full interactivity, but also references the US experience as illustrative of what service providers are aiming for in Ireland. However, the question still is how much people will pay for interactive TV, while emitting as the *Economist* describes it, a collective "yawn" all over the world.

Meanwhile, back in Palo Alto, the article author reports on a showcase held by Intel and Oracle about ISDN (integrated services digital network) technology, and identifies this as a turning point, where the information highway moves from the TV to the desktop:

> "Of course there is a future for **interactive** television – there is too much invested in cash and corporate egos to let it go away – but meanwhile...the mouse is going to be most people's method of transportation along the information highway."

Ultimately, the article captures what media and technology industries saw as the promise of interactivity in television in terms of potential revenues, as a strategic engine for progress on the information superhighway and as a marketing tool for enticing consumers. But it is also accurately critiques what Lee & Lee (1995) call the "leaps of inference" that proponents of new technologies are prone to making, without taking into account 'necessary and realistic assessments' of the needs of consumers (ibid 1995:10). The letter writer wraps it up, saying:

> "...reality took a big bite out of the information highway and many companies have pushed their projections for **interactive** TV out by at least 5-10 years."

c) Terminal decisions – the thread continues:

The future for interactive TV was very uncertain in 1995 but experiments continued, with a different kind of interactive television provided by another kind of box. A second sample article from 1998 reports on the potential new battleground between digital TV and internet TV, following Microsoft's initial release of WebTV products in the US. Their director of online services in Britain is quoted saying:

> "internet television's strength is its **interactivity**, [it is] "better TV" while digital television is just "more TV". [49]

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[48] "'Cable companies getting into Internet services market" by Eoin Licken, *Irish Times,* December 19, 1997.

The interactivity of television is presented as a technical feature of the internet, borrowed for use on a TV screen but having a qualitative advantage over digital television. However, satellite broadcaster Sky television's next move could be read as the broadcasters' response. When they broadcast the first 'interactive' football match between Arsenal and Manchester United in 2000, allowing viewers to choose different camera angles and instant replays for the first time, they showed what digital TV could do [50]. This development is described in another article in the thread from 2000, as "less about changing the way we watch football than about changing the way we pay for it" [51]. It cites a British journalist on how united the television industry is about interactivity, "the killer application which entices people to invest in digital and subscription TV"[52]. Interactive TV achieves its revenue generating potential, through private subscription fees for the service itself, rather than its capacity to facilitate commercial activity.

Then in 2000, the launch of the first interactive TV advertising campaign in the UK (and Ireland by proxy) was reported. Sky's 2.6 million subscribers were invited to click the red button at the end of Unilever's *Chicken Tonight Stir it up*! advertisement to receive money off coupons[53]. The key to the success of this kind of interactivity was being able to directly measure the response which was "closing the loop between advertiser and consumer" according to the advertising company Ogilvy & Mather. But crucially, the decision was also 'entirely technology driven' and its success meant that by 2007, one in fifteen of all ads broadcast on SkyDigital would be interactive[54]. Interactive TV was now exploring alternative revenue streams and the benefits to marketing of the information gleaned through its interactivity.

Over the following years, interactive TV programming moved away from the TV set as 'container' and focused more on interactive TV 'content', via the internet. In 2001, the BBC announced that in future only programmes with "interactive and online elements attached" would be commissioned. A sample article cites the recently appointed new media chief for the BBC, Ashley Highfield:

> "He told programme makers...that it was no longer viable to take programme pitches without **interactive** elements, such as SMS, Internet or **interactive** TV"[55].

The definition of interactive TV is expanding beyond the description of a technology enhanced by wires and switches, and beyond commercial activity between consumer and TV

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[49] "Murdoch and Gates go head-to-head on TV" by Eoin Licken, *Irish Times,* April 10, 1998.
[50] Sky Fact book, 2005.
[51] "The fight over football", by Harry Browne, *Irish Times*, February 2, 2000.
[52] Ibid.
[53] "Interactive advertising comes into your home" by Bernice Harrison, *Irish Times*, March 16, 2000.
[54] "Seven years from Chicken Tonight: a spotlight on interactive audiences" *Thinkbox,* available at http://www.thinkbox.tv/server/show/ConCaseStudy.637 [accessed April 4, 2011].
[55] "Broadcast News" by Maire Kearney, *Irish Times,* March 17, 2001.

set. It no longer describes merely the interactivity of the box with other data streams, but the interactivity of the content itself with users, the internet, mobile phones and so on. This is closer to the 'convergence of technologies' perspective of Gates (1995) than the 'structural convergence' of the band of visionaries in the original 1995 article.

By 2002, the income from SMS messaging services was a key revenue generator for television broadcasters around the world. Another thread article from that year cites a study which reported that a Catalan TV company covered the entire cost of production of a TV show from the SMS revenue generated in one broadcast, while a German show generated 1.2 million SMS messages in half an hour[56]. But even before then a landmark event in interactive TV in the UK had taken place in 2001 with the broadcast of Big Brother 2, the highest rating show of the year for Channel 4. The ratings paled in comparison with the technical advances and the revenues they generated that year:

> "...providing access across nine different platforms, Big Brother 2 achieved some impressive firsts: 5.6 million votes were cast via **interactive** TV – easily the biggest **interactive** application in the UK"[57]

Now interactivity describes how different media and technology 'platforms' communicate with each other as much as with user/viewers. The head of 'interactive media' at Endemol UK, the programme producers, is quoted:

> ""We're creating this virtuous circle that excites the **interactive** audience about what's going on in the house, drives them towards the TV programme, the TV will drive them to the internet, the internet to the other ways they can get information, and the other ways drive them back to the TV", says Mr Short. Deepening viewer involvement and generating revenue is the goal. The website…is not cheap to run but it builds the Big Brother brand."

No wonder the BBC felt it had to force the issue and start incorporating interactivity into programming wherever possible. A division of Sky Television – Sky Interactive – had taken over provision of the 'interactive solution' for Big Brother 2 on behalf of Endemol UK and Channel 4. Their approach to interactivity went far beyond offering viewers extra services and the revenues generated from SMS messages. Emphasis had now moved to 'brand' and the marketing aspects of interactivity, which in turn generated further revenues. Instead of trying to market the interactivity, broadcasters had discovered the marketing power of interactivity itself.

The reference by a television production company to a 'virtuous circle' between viewers and content, describes a convergent paradigm in the technological platforms and markets

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[56] "SMS delivers cash boost for TV", *Irish Times*, August 20, 2002.
[57] "Technical advances are turning Big Brother into a money-spinner" by Jeremy Head (Guardian News Service), *Irish Times,* May 24, 2002.

operating between media producers, distributors and consumers. It recalls the language of the Bangemann Report (1994) which emphasised the importance of creating "a virtuous circle of supply and demand" of information services in order to achieve the 'critical mass' required to 'liberate market forces' (ibid: p.23) to bring Europe into the information age. One of the 'priority applications' that would kick start this revolution included the "personal home market (**interactive** and transaction applications related to teleshopping, telebanking, entertainment, leisure)" (1994, p.24).

d) Discussion - the circuit of culture of Interactive TV

Interactive TV can be analysed as a circuit of culture, in its conceptualisation, promotion and adoption over the sample. Following the five interrelated aspects outlined by du Gay et al (1997) in studying an object within such a circuit, the representation, identity, production, consumption and regulation of interactive TV all contribute to its patchy success. The meaning that is derived from the representation of interactive TV has limited the meaning of interactivity itself. Interactivity is represented by industry elites as a close relative of convergence, yet convergence is in dynamic tension with change (Pool, 1983) so interactivity suffers from the same instability in *representation*. Industry interests and journalists impose an *identity* on interactivity as a characteristic of various different technologies but again with inconsistency. Despite talk of convergence, wide cultural and structural differences exist between the different industries involved in *production* of interactive TV, a technology in which radical change in consumption and regulation is invested. In terms of *consumption,* users are disinterested because the reality did not match the hype, but some success is observed in the rise of SMS revenue based programming while the relative stability of interactive advertising on television indicates a market for engaged consumers. Finally, de-*regulation* in the US left interactive television at the mercy of industry, with no competing public service vision of what it might offer to viewers. The EU context on the other hand produced a complex regulatory environment in member states (Murphy, 2009), which proved to ultimately benefit private rather than public provision. The result is that interactive TV is available only as a limited subscription based service, which has had at least ten years to define and imprint its own particular style of interactive television on the market. Thus the potential for an alternative free to air interactive service that would offer a different and 'fundamentally new' vision of interactivity (which should go beyond merely enhanced sports and entertainment viewing, as noted by Galperin & Bar, 2002) is increasingly limited.

The discourse communities represented in this thread include ICT industry elites, broadcasters, media content producers, policy makers and journalists. Policy makers and journalists discuss an alternative public service vision of interactivity but it is no match for the vision and power of the commercial interests, particularly from the US, who have paid for

interactive TV in deregulated markets. However, some policy discourses reflect an industry discourse style. For example Bangemann (1995) is considered to have relied heavily on the support of ICT industry professionals in the direction of the recommendations in his report, who urged the creation of a new liberal regime for multimedia markets centred on digital television (Murphy 2009: 125). The representation of convergence in particular has been found to be "part of both popular and professional rhetoric" (Murphy, 2009:p202). This suggests that even though discourse communities such as business and policy may differ in terms of membership and goals, the style of rhetoric can be comparable and the combination of different communities having a similar discourse style may enhance both their impact and range of influence.

e) The Advertising & Marketing thread on interactivity

A number of articles in the sample report on how advertisers are responding to changes in the media technology environment and as noted in the findings, advertisers are one of the more quoted groups. This article from 2008 reflects concerns in the industry and their influence over discourse in advertising and marketing theory, noted in the literature review.

"Advertisers have a new buzz phrase to engage consumers in the digital marketplace", by Siobhan O'Connell, *Irish Times*, June 19, 2008

This article reports on "engagement marketing" a concept introduced by advertising agency Ogilvy (one of the worlds largest) at a 'briefing' for clients in Dublin. According to Ogilvy's spokesperson, "the Web 2.0 phenomenon has changed the face of marketing forever". This invocation of 'Web 2.0' is the first of several indications in the article that the advertising community sees itself as responding to changes in the digital environment, in a similar way to how media companies responded to 'convergence' in the interactive television thread. There is no further explanation of what 'Web 2.0' entails, indicating that readers are thought to be familiar with it due to repeated use[58].

Most of the article focuses on the interpretation of the new environment by Chris Upton, of Irish agency McConnells (one of Ireland's largest ad agencies). He suggests that internet users in 2008 are more sophisticated "are in complete control of what they interact with and edit the superfluous in an instant". Advertisers are noticing the impact of the empowering effects of interactivity:

> "Brands need to focus on how they can assist the consumer and give them the information they need and want to **interact** with. Digital enables far greater

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[58] The term 'Web 2.0' emerges in ten different articles across the entire sample, and is addressed in more detail under the *Futuropia* theme.

interactivity between the consumer and the brand, and allows consumers to discover brand truth for themselves, forming a stronger and longer lasting relationship…"

The advertising agency is not a business selling products to consumers but a facilitator in the communication between consumers and brands. It is the 'brands' that need to focus on consumers, while 'digital' has certain features and needs of its own. Consumers will 'discover brand truth' whether this exposes myths or unveils icons, almost as though the ad agency has no control. This style of distancing in self-representation is commonly found in discourses among the advertising community[59]. The agency representative is also perhaps aware that readers are potential consumers and may be wary of the advertiser's agenda. Giving an active voice to both 'brand' and 'digital' lifts the advertising exercise out of murky sales talk and creates a neutral environment in which advertisers act as digital matchmaker for consumers and products. Upton continues to describe these needs:

> "…what digital requires is that the content that is created becomes a medium in itself.
> Finding ways that consumers can **interact** with your brand is the way of the
> future…It must have credibility and be enjoyed or it will be seen as just another
> advertising message and deleted."

There is a technological determinism perspective here, where the digital paradigm is presented as determining how brands will speak to consumers. This has given consumers the ultimate power that concerns advertisers most – deletion. Rather than not following a link or seeing ad content all the way to its ultimate fulfilment of online purchase, the new digital advertising platforms (viral emails, video content, animation etc.) are whole entities which can be accepted or rejected before content is even viewed. Content which 'becomes a medium in itself' inherently carries the ability to track consumers' use of that medium, which is of course the attraction to advertisers when it works. Deletion however, is the ultimate disengagement, breaking off the relationship with the brand.

Referring to content as medium shows how little loyalty advertisers display for particular technologies and platforms. Whatever can be used to transmit a message will be used, even if it does not always work. This may explain advertisers' disinclination to wait to understand newer technologies – or features like interactivity – before the rush to use them. The trial and error nature of the digital interactive advertising world means that a consumer that 'engages' with a brand also gives advertisers proof of concept. Interactivity in advertising may have handed the initiation of a conversation over to the consumer, but their relationship with the brand is still within the 'virtuous circle', built by advertisers and brands.

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[59] Few advertising agencies (including Ogilvy and McConnells) use the term 'advertising agency' to describe themselves, preferring the words 'creative solutions', 'brand communicators' and 'digital marketing'. The home or top level pages of many agency websites for example use these descriptions more frequently, with advertising referenced in relation to specific campaigns only.

The article next cites a representative of Vodafone, one of Ogilvy's clients, described as 'an advertising medium' because phones now can carry ads. Their consumer director notes that "it's not enough anymore just to have a banner ad…there have to be formats that entertain the web user and interact with them" although these formats and how they are interactive are not explained. It is not clear either who feels that banner ads are 'not enough anymore', whether it refers to brands, the competition, the agencies, the consumers, the internet or the entire digital environment itself.

Interactive advertising has resulted in a proliferation of content and material which must be designed, produced and purchased, so there is an incentive for agencies to push for cross platform campaigns, particularly where media space is much cheaper than in offline environments. But the increasing sophistication of consumers and the success of such interactive campaigns also indicate market demand for this approach[60]. And as with all advertising, what appears one day as a radical and risky campaign style becomes industry standard the next, putting pressure on both brands and clients to innovate and compete.

At the end of the article, another advertising executive questions the idea of the mobile phone as advertising medium – it is "an extremely personal device, so brands have to beware of intruding into other people's space when not invited". This is a polite warning to the phone company via its 'brand', but it also reflects one of the issues raised in the content analysis findings. While interactive communications take place more often in public than in private spaces, hybrid or layered interactivities may occur where the private/public boundary is undefined, as with mobile phones. The advertising executive suggests that understanding consumer behaviour includes understanding how they use interactive media and not just how they relate to brands. Crucial to successful advertising campaigns is understanding that privacy is a line that cannot be crossed.

f) The future of advertising is now

An earlier article from 2002 directly addresses the boundary between public and private In advertising. It also demonstrates how the cross-pollination of ideas on media and technology across the media industry occurs, discussing how the newly released film *Minority Report* (2002) depicts the future of advertising[61]:

> "The idea is that **interactive** advertising which is at present at a fairly primitive stage will evolve by 2054 – when the film is set – to the point that it will actively engage with consumers."

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[60] The digital advertising market has grown to represent 20% of all advertising market spend in the UK and over 10% in Ireland see IAB PwC Digital Marketing report 2010 available at http://iabireland.ie/wp-content/uploads/2011/04/IAB_PDF2010.pdf [accessed September 19, 2011].
[61] "Brands demonstrate interactive talent" by Bernice Harrison, *Irish Times,* July 11, 2002.

Like *Blade Runner* before it, the film *Minority Report* is heavily invested in technological prediction[62]. It depicts a dystopian worldview with strong allusions to Bentham's Panopticon and Foucault's vision of modern social discipline (Garrett Cooper, 2004). The simplistic use of *Blade Runner* as metaphor to describe interactive technologies, that ignored the more sinister postmodern discourses which run alongside, is repeated in this article. It takes a superficial reading of the interactive technologies used in *Minority Report,* focusing on 'futuristic' gizmos and gadgets, ignoring the 'colonisation of the unconscious' advertising might represent in the film (see Garrett Cooper, 2004).

The key point in the quote is that advertising "will actively engage with consumers" and not the other way around. Interactive advertising in the future operates by using retinal scans and other recognition software. It offers products personally to the protagonist - "John Anderton, you look like you could use a Guinness".

However, the more sinister interactive ads mine the subconscious to find what people secretly covet, doubling as state agents who track the movements of potential criminals. Vision and sight are key themes in the film and through the protagonist, the viewer learns that images are not always trustworthy and what appears to be evidence is not always true (Capers 2009). This is probably not the kind of 'brand truth' that the advertising executive envisaged in the previous article. It is an invasion of private space which is eroded to the point of extinction. Real brand names were used in the film because director Steven Spielberg wanted to ensure the world looked like planet Earth. According to the article, an LA advertising agency created "space-age fictional television advertising commercials" and many of the ideas came from technology, advertising and marketing industries and thus art imitates life, imitating art imitating life. Later in the article, yet another brand is associated with the film's visual style:

> "The head of Nokia design, Mr Frank Neuvo, designed the futuristic communications devices in the film, such as the **interactive** screens, which are themselves branded. "Even though our daily work is to design the future of communication devices, this film provided an exciting opportunity to look even further into the future and imagine how people could communicate in 2054," he said."

The article focuses mainly on the promotion of Nokia's new handset design (which the film association neatly complements), rather than ideas in the film that suggest such communications may have more sinister and threatening uses against consumers in future. As Garrett Cooper (2004) notes, "in the network of images these devices enable us to imagine, the pitching of products and the identifying of criminals are entirely complementary tasks" (ibid:p.38). Indeed, in the network of industries we see behind the making of this film, depictions of the future and the pitching of products also appear to be complementary tasks.

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[62] For example see "Six real gadgets *Minority Report* predicted correctly*"* by Brian X. Chen, *Wired,* available at http://www.wired.com/gadgetlab/2008/11/four-future-gad/ [accessed April 5, 2011].

Interactivity materialises in the space between the pre-production, the film itself and ad campaigns which use sequences from the film on other platforms. It facilitates 'engagement' by consumers between trailers, ads and the film itself, although the kind of activity this allowed in 2002 was limited to "downloading ringtones and graphics" and whatever level of subliminal engagement that exists with product placement. But the kind of unconscious and potentially fatal engagement with interactive advertising experienced by John Anderton represents a line relating to privacy not yet (we think) crossed by these technologies. Ironically, by raising awareness of technological potential, the film itself may act as a safeguard against the kinds of threats and vulnerabilities ambient intelligent media might represent in society (Wright, 2008). More recently, an emerging discipline of 'consumer neuroscience' notes the potential for eye-tracking and electroencephalography (EEG) in analysing 'preconscious' consumer behaviour, helping to show what consumers are thinking when they see something (Ohme et al, 2011). Therefore colonisation of the *subconscious*, if not yet the *unconscious* may still be a possibility.

g) The E-commerce thread on interactivity:

> "**Interactivity** was a pipe dream, we were told (in 1993) the media equivalent to a UFO. Today the UFO has landed. The internet and the DVD have everyone scrambling to deal with a digital reality whose effects will be profound."[63]

This quote appeared in the sample in a weekly round up of industry quotes published in the *Business* genre in 1998. It encapsulates the media industry's' concerns then as to what the new digital paradigm would do to their business – the key word is 'scrambling'. The UFO of interactivity had landed but no one had yet opened the door to see what kind of aliens might emerge. The speaker, Gerald Levin of TimeWarner, saw interactivity not as some extraterrestrial object but as a characteristic of the convergence of industry, believing that future markets belonged to media industries that controlled both content and distribution[64]. Two years later Levin would sell TimeWarner to AOL in return for AOL shares, in the largest merger ever in US history, the zenith of the convergence of industries, which he later described as the 'worst deal of the century'[65]. Interactivity did become a key strategic element in the new business environment, not through the merging of media powers but rather through the e-commerce potential of the internet. The next article was published the same year the

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[63] Time Warner's chairman and chief executive, Gerald Levin, speaking in Los Angeles, cited in "Textbites", *Irish Times* June 15 1998
[64] See "Levin's legacy at AOL Time Warner" by Mark Lewis, *Forbes.com,* May 17, 2002 available at http://www.forbes.com/2002/05/17/0517levin.html [accessed April 5, 2011]
[65] "Levin admits to worst deal of the century" by Andrew Edgecliffe-Johnson, *Financial Times,* January 4, 2010 available at http://www.ft.com/cms/s/0/828fd9f2-f96f-11de-8085-00144feab49a.html#axzz1Im5HKP6g [accessed April 5, 2011]

UFO landed and reports on how interactive digital media are helping retailers to enhance their customer relationships:

"Big retailers are watching you" by the Financial Times Service, *Irish Times,* November 13, 1998.

This article is syndicated from the *Financial Times Service,* whose respected business analysis credentials would be influential over discourses on e-commerce. It notes how the scale and speed of information gathering is radically changing both strategies and relationships in business:

> "A handful of companies are using the information-handling potential of the digital revolution to create an **interactive** relationship which allows customers to tell producers what they really want. In this two-way exchange, there is the opportunity to learn much more about each customer and offer a range of truly personalised goods and services more likely to succeed in the market."

This instrumental view of interactivity involves a 'two-way exchange' of information between retailers and consumers opening the way to a more personalised service. It represents a holy grail for retailers, as prior to this point the best information available could only analyse past purchases or group potential customers along behavioural lines. This new detailed information on an individual's behaviour arms producers with the ability to target consumers with specific products and information, reducing instances of failure. But while the rules of engagement may have shifted, the communicative end goal for retailers is the same, viz. to sell products. The end goal for users on the other hand may have some new elements such as product and price research, facilitated on the web by the reduction in the cost and effort involved (Bakos, 1997). This was the promise of the 'frictionless commerce' that the web originally presented for consumers, but which belied the greater rewards for producers in accessing and utilising customer information (Ancarani, 2002). There is a low level of empowerment for customers in telling producers what they want, but at this stage it has just two potential outcomes for them – accumulation of information and/or purchase.

> "**Interactivity** allows the consumer to shape the product and supplier to learn from the consumer," says Mr Anthony Freeling of McKinsey business consultants.

Including a quote from one of the world's largest management consulting firms, shows readers that interactivity is part of the 'problem solving' process for business strategy used by consultants like McKinsey. Indeed, McKinsey had published its own research on the new strategic direction that interactive media presented with respect to information growth,

building relationships and opening up new channels, with a warning for those 'who cannot keep pace' (Kierzkowski et al, 1996).

Meanwhile the article author continues with a number of examples of companies leading the field:

> "The most successful websites in developing this **interactive** exchange are almost all start-ups, rather than established consumer groups or retailers. They include: Amazon, the online bookshop; CDnow, which sells music albums; and Expedia, a travel agency owned by Microsoft."

From today's perspective it is easy to forget that Amazon was once a 'start-up' and it appears almost perverse to need to describe what it does in a newspaper article (it is now much more than an online bookshop, having bought CDnow in 2002 along with other businesses to become a general retailer)[66]. The impact this new 'interactive exchange' was to have on the kinds of products bought and sold and the business structures behind them, is brought into sharp relief by examining three terms used here – 'bookshop', 'music album' and 'travel agency'. These three traditional and then stable commercial entities are now barely visible on the current physical retail landscape. Companies such as HMV, the last of the music retailers on the high street (and which bought the bookshop Waterstone's in 1998) are struggling to keep doors open, while the digitalisation of both music and airline tickets have fundamentally challenged the concepts of 'album' and 'agency'[67]. In less than ten years, these 'start ups' and the 'interactive exchange' have become the establishment worldwide.

The article describes how new online entities build 'customer profiles' through recommendation and suggestion tools, now ubiquitous in the refrain "customers who bought this item also bought…" This was the novelty that quickly became serious business strategy (Schafer et al, 2001) building the repeat business that supplied 60% of Amazon's sales that year, according to the article. The level of personalisation offered by Amazon soon went beyond just recognising site visitors and offering some personalised choices. The aim was to offer each online customer his or her own personal shop – an impossible retail strategy in the physical world[68].

The rest of the article focuses on 'conventional retailers' like supermarkets and how they also benefit from the digital revolution, through data sourced via electronic points of sale (EPOS) systems, loyalty cards and so on.

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[66] "amazon CDnow make it official" by Margaret Kane, *CNET news,* December 4, 2002 available at http://news.cnet.com/2100-1023-976008.html [accessed April 6, 2011].

[67] The music retailer is struggling to develop a new business model as reported in "HMV prepares for split to stem rising debt" by Mark Wembridge and Clare Barrett, *Financial Times,* March 25, 2011, available at http://www.ft.com/cms/s/0/841e6c4a-56cd-11e0-9c5c-00144feab49a,s01=1.html#axzz1Im5HKP6g [accessed April 6, 2011]. Meanwhile the future of Waterstones, which closed its Irish shops in 2011 is discussed in "Do bookshops have a future?" by Tim Walker, *The Independent"* March 14, 2011 available at http://www.independent.co.uk/arts-entertainment/books/features/do-bookshops-have-a-future-2240874.html [accessed April 6, 2011].

[68] As Jeff Bezos, founder of Amazon, put it "If I have 3 million customers on the web, I should have 3 million stores on the web", cited in Schafer et al (2001).

"This gets away from the 'spray and pray' approach which sends money-off coupons for nappies to middle-aged customers," says Mr Richard Taylor, e-business consultant for IBM the information technology group. The growth of home shopping offers opportunities for a more **interactive** relationship with the consumer – using the same techniques as the online retailers."

Another consultant's opinion is offered, reinforcing the concept of interactivity as a core element of business strategy. Taylor's comments value the accuracy of targeting that the interactivity facilitates – it has finally allowed businesses to communicate with the right people and offline retailers are also learning new strategies from the e-commerce paradigm. Finally there are some negative aspects of this interactive data relationship reported. For producers, it is where retailers gain 'undue power' in the supply chain because of the detailed customer information available to them. On the other hand, producers can bypass retailers altogether, using the information to engage directly with consumers. Both show that interactivity in e-commerce is forcing changes in business structures and strategies. McKinsey's warning to those who do not keep up looks more prophetic as the article comes to a close, but the final advisory word is given to IBM. Knowing a customer's "history" and being able to approach them "sympathetically" is the key competitive advantage in the new business paradigm. Thus interactivity creates a sense of intimacy and personal relationship with the customer. Indeed the importance of this interactive relationship creates intense competition between producers, distributors and retailers, resembling suitors seeking to eliminate each other in pursuit of the target's hand.

Like Laertes' funeral shroud, the information leading to the perfect match is slowly stitched together but can be unstitched by customers unwilling to return the retailer's advances. At least this was the case in 1998, whereas such interactivity in later years allows information on customers to be obtained without consent either in secret, or via a ruse. Indeed the Trojan horse may be an image as appropriate for interactivity in business as Gerald Levin's UFO, the name given to malicious software designed to steal private information while pretending to be user friendly. Suitably, its differentiating characteristic from other such malware is that it requires user 'interaction'[69].

Indeed the images of interactivity as both UFO and Trojan horse illustrate the polarisation of perspectives held in the business world on interactivity. Commercial interests swing between seeing it as threat or opportunity, a vehicle to incredible new worlds and relationships or an unwanted gift of technology hiding catastrophic effects for established businesses. For consumers, the question remains as to what happens to the threads of information. The impact of data mining on customer privacy regardless of purchase choice does not emerge as a

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[69] "What is the difference? Viruses, worms, Trojans and bots", *Cisco Security Intelligence operations,* available at http://www.cisco.com/web/about/security/intelligence/virus-worm-diffs.html#6 [accessed April 6, 2011]

significant issue in the sample, but is worthy of further research into the role played by interactivity.

h) Conclusions on the Commercial theme

Early in the sample, the ICT industry 'construal' of interactivity presented it as a relative of convergence and a characteristic of 'their' medium, whether a feature of switches and cables or broadcast networks, satellite links and SMS. But later the value of interactivity for industry shifts to its 'cross platform' potential, particularly for advertising and Interactive TV. The *Commercial* theme therefore focuses on the feature which remains after all the trial and error, prediction and investment across many business sectors is examined. Interactivity relates to the many ways to access the same content, but also the many ways in which content can now be presented and deployed.

When interactivity was separated from TV, and placed within the 'virtuous circle' that increasingly converged digital services provide, it began to achieve some success. Indeed the circuit of culture represented by the Interactive TV coverage results in a limited service, and therefore a limited 'added services' representation of interactivity. However, these new services, features and styles of communication have changed the broadcaster/viewer relationship and added many more potential participants to the communication event. Meanwhile, interactivity is also changing the structures and relationships within advertising. Interactivity empowers consumers to disengage from communication, but this is counter balanced by the array of advertising and marketing platforms made available, which is in turn encroaching further on private space. Under the *Commercial* theme, interactivity plays a role as a boundary object between the public and private communication space. The perspectives presented from the advertising community and the ICT industry suggests that there is awareness of the boundary between public and private. But user voices are missing from the coverage, a perspective which is required for clarity on who manages the boundary or controls the interactivity.

The depiction of interactivity in e-commerce as either UFO or Trojan horse illustrates the polarisation of perspectives on interactivity under the *Commercial* theme in general, as either a threat or an opportunity or both. Overall the commercial community sees value in interactivity but requires the support of further themes to capitalise upon it.

7.3 Analysis of the Pedagogical theme

This theme represents interactivity as an aid to teaching and learning, thought to impact positively on outcomes. Three story threads in particular dominate in the theme: first, the long planned but as yet unrealised national 'interactive' science museum; second, the development of policy and investment in ICT in education in Ireland; and third, the adventures of various Irish software companies in the international e-learning marketplace. These threads show the breadth of fields into which the pedagogical theme extends, beyond the classroom. The analysis follows each thread as played out in the museum, classroom, boardroom and online, so that the full picture of the pedagogical understanding of interactivity can be observed.

a) The 'interactive' science museum thread

Fifteen articles in the sample made reference to plans for an interactive science museum in Ireland, varying between news updates, policy announcements, press releases, stories on development projects and general opinion pieces on the value of science museums in society. This analysis examines a selection from the thread, beginning with an article linking the idea of a science museum to the value of science in society. The author, a professor of biochemistry and weekly columnist on science issues in the *Irish Times* stresses the importance of scientific literacy and how it might be achieved:

> "In Ireland, two basic initiatives that spring to mind are the establishment of a strong primary school science curriculum and the foundation of a large general science museum with good **interactive** exhibits."[70]

Interactivity is presented as a characteristic of the medium. The exhibits are interactive, but no explanation is given of what they are or how or why they might improve scientific literacy. The suggestion is that the interactive exhibits usually found in science museums are inherently associated with learning and the acquisition of knowledge. In isolation, the article gives the impression that this view was generally accepted throughout the science community. But the next article presents a dissenting view, in a lighthearted paean to Dublin's only existing science exhibition space, the Natural History Museum. The article was prompted by a recently published book which devotes a chapter to the museum (see Gould, 1995). The article author, a freelance science writer, describes why the author Steven Jay Gould was so taken with the museum:

> "The triumph, for Gould, is a faithful restoration to the original, to the "Victorian cabinet museum". For, despite his reputation as a science populariser, he has little time for the hi tech **interactive** computerised scientific exhibits so popular elsewhere

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[70] "Scientific knowledge essential for society", by Dr William Reville, *Irish Times,* August 14, 1995

today."[71]

This again associates interactivity with the exhibits usually found in science museums. The intertextual reference shows Gould is indeed skeptical about their value:

> "…the curators of Dublin have stood against most modern trends in museums of science – where fewer specimens, more emphasis on overt pedagogy, and increasing focus on "**interactive**" display (meaning good and thoughtful rapport of visitor and object when done well, and glitzy, noisy pushbutton-activated nonsense when done poorly) have become the norm". (Gould, 1995:p.244)

He sees interactivity as a trend in display rather than a tool for pedagogical effect, suggesting it occurs in the space between visitor and object, an aspect of interpretation as much as communication. An 'aesthetic' subtheme is thus introduced, as the success of interactivity depends on design 'done well' or 'done poorly'. The mark of success is 'rapport', again implying a relationship between visitor and object, but with no detail as to how and when this is achieved or measured. His sceptical view of interactivity is emphasised in his use of scare quotes around the term (explored further under the *Sceptical* theme).

The Natural History Museum in Dublin is typical of the Victorian science museum style which sought to educate in a highly instructionist way. The museum is considered the repository of fact and knowledge and visitors are vessels to be filled (see Witcomb, 2006). Many such museums were originally private collections and only opened to the general public (and not just 'learned men'), because access was thought to bestow advantages in terms of education (Abt 2007). Rather than standing against modern trends in display, the 'curators of Dublin' were simply adhering to the exhibition design style of its origins. They were also restricted both physically and financially from fundamentally changing the original communication style of exhibits (see Monaghan 2007).

Gould asserts that pedagogy in modern science museums is more 'overt' than in the Victorian cabinet museums, which were "microcosms for national goals of territorial expansion and faith in progress fueled by increasing knowledge" (1995:243). The Victorians saw expansionist and imperial benefits to the acquisition of knowledge, while modern science museum enthusiasts extol the personal and societal profits of science literacy. But both eras are at one on their concern with progress, represented by former in the content of exhibits and by the latter more in the manner of their display.

b) Science museum design

In 1997, the State's largest ever urban renewal scheme in Dublin's docklands was unveiled, which included an interactive science museum as "anchor" project[72]. While only making

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[71] "An Irishman's Diary" by Mary Mulvihill, *Irish Times,* June 17, 1996

minor reference to an "interactive science museum", it hints at a perceived public value in such a concept. However, three years pass before the first detailed explanation of the museum plan is given, in an opinion piece by the recently retired President of Dublin City University. Published in the *Education* supplement in 2000, it clearly lays out its pedagogical stall:

> "A science centre, on the model that is now well proven in many places around the world, is a place where one can see science happen – and even more important, experience science by doing it. **Interactivity** is the key word in successful science centres. A world-class centre of this kind could put science on the map for the Irish public. Done well, a science centre provides a spectacular public attraction. It could be the essential foundation-stone of a national campaign to make science and engineering more attractive as school subjects and as career choices. It could, in a phrase, glamorise science in a way it never has been in Ireland before..."[73]

This account renders any further debate around the appropriate pedagogical approach to science, or how exhibits within science museums produce outcomes superfluous. Again, international practice is sufficient proof of concept. This reflects the literature reviewed where interactivity is seen not just as a distinguishing characteristic of science museums, but a prerequisite (Hughes 2001:185). The model of 'doing science' is associated with science museums internationally and can be traced back to the very earliest examples in the nineteenth century (see Gregory & Miller, 1998). However, describing the museum as a 'spectacular public attraction' suggests success is measured in visitor numbers and popularity rather than through pedagogical outcomes. Its success in fact will be measured in its influence over choices made by students to study science. This invokes an empowering and potentially commercial aspect of interactivity rather than its pedagogical effect.

In late 2000, while touring the Shanghai science and technology museum, the Tanaiste announced formal cabinet approval would be sought for a science museum:

> "It is envisaged that it would be an **interactive** museum in which children and other visitors could interact with exhibits, and with interchangeable sections which could be exchanged with museums abroad....Ms Harney said she became enthusiastic about such a project after visiting the science and technology museum in Tel Aviv last year. "The reasoning behind such projects is that Ireland has got to stay at the forefront in the area of science and technology", an official [from the Department of Enterprise Trade and Employment] said. "It's very important that we interest kids in science and to take science in secondary schools"."[74]

This is the first comment from a public representative on the issue. It initially represents a pedagogical theme, noting the importance of encouraging interest in science and so on. However, in the first sentence, the words 'interactive', 'interact', 'interchangeable' and

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[72] "Docklands scheme would be largest ever" by Frank McDonald, *Irish Times,* May 31, 1997
[73] "How can we attract students to science?" by Danny O'Hare, *Irish Times*, May 23, 2000
[74] "Harney reveals museum plan", by Conor O'Clery, Foreign Correspondent, *Irish Times,* September 13, 2000

'exchange' appear to merge into one another, suggesting that public representatives see the role of an interactive science museum as a selling point for Ireland, a tool for establishing international relationships or a marketplace of exchange. This suggests a perspective closer to the Victorian outlook where such museums reflect progress in society. Yet the reference to Ireland being at the 'forefront' of science and technology, places the political outlook somewhat at odds with the general consensus that science literacy is poor. The 'reasoning' is based on the perception government wish to create rather than pedagogical goals.

That science museum visits form a regular part of trade missions, reinforces the commercial subtheme. Meanwhile the museum's other, perhaps more minor role as an attraction for 'children and other visitors', invokes a 'Hula-hoop' subtheme. The casual use of the term 'kids' by a government department official suggests the only pedagogical aspect is of a low level, nonspecific, instructionist kind.

By 2001 criticism is emerging over the lack of progress on the science museum plan:

> "For 15 years, the Discovery group has been seeking to persuade the DDDA, its predecessor and several Government departments that the best possible use for Stack A is an engaging and **interactive** science museum...The DDDA never saw a science museum as a viable use for Stack A: quite apart from any reservations of principle, the space it has allocated for museum use is too small to accommodate the sort of science museum that would capture the public imagination..."[75]

Critical of both government and developers for prioritising the commercial over educational projects, the writer contrasts the situation with developments in Belfast, where the W5 science museum has just opened. Designed to "unlock the scientist in everyone", it has "floor after floor of **interactive** exhibition spaces" and "is just as engaging as the Cité des Sciences in Paris or the Metropolis science centre in Amsterdam..."[76] An enthusiastic review notes the pedagogical aspect of interactivity, found in 'hands on exhibits' which are 'engaging'. A ludological perspective also arises where visitors are not just handling but 'playing' with exhibits. A connection between play and learning is found in educational, behavioural and cognitive psychology and is explored further under the *Ludology* analysis.

c) Interactive science museum – a working definition

In 2002, a letter to the newspaper, cites a Government report which identifies the establishment of a national science centre as an action area[77]. The letter gives the first detailed explanation of what an interactive science museum actually is and how it might work:

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[75] "Making the sums stack up" by Frank McDonald, *Irish Times,* May 4, 2002, The DDDA refers to the Dublin Docklands Development Authority
[76] More international references, as reported in "Making the sums stack up" byFrank McCdonald, *Irish Times*, May 4, 2002
[77] Report and Recommendations of the Task Force on the Physical Sciences (2002)

"Key characteristics of science centres are their space (versus time) frame, social context, three-dimensional, multi-sensory **interactive** qualities, employing a very large or very small scale, and presenting science both in and out of context. Therefore, curiosity, questioning, learning at a leisurely pace, accelerated learning, playfulness, exploration and avoidance of failure are the qualities that grow from a visit to a science centre. Informal science education uses **social interaction** and inter-generational learning and invites people to participate on a voluntary basis. This contrasts with formal science, which is taught within a school structure, on a time scale and directed by a teacher. The two are complementary, not mutually exclusive."[78]

This carefully considered overview, by the Discovery group promoters quoted in the previous article, contains references to a variety of pedagogical approaches interactivity supports. The 'key' characteristics outlined use further subthemes of interactivity in support of the pedagogical outcomes. First, the "space (versus time) frame" of science centres suggests a visitor experience where perception of the space has a pedagogical effect as much as the procedure of acquiring information over time. This utilises the *Aesthetic* theme, in the merging of design and experience and impact on visitors' senses. It reflects the original vision for the Exploratorium in San Francisco, the model for many modern science centres around the world which attempt to use the "power of perception to access the natural world" (Gregory and Miller 1998, p.202).

The aesthetic perspective also arises in how the phrase 'interactive science museum' describes a building and the space inside as 'interactive' as much as the individual exhibits or approaches to pedagogy in the exhibition design itself. Interactivity describes the entire museum as though it is itself a technology of communication – a medium. This echoes Silverstone's proposition that in their treatment of spaces, times and logic as much as their ability to educate and enlighten museums have the potential to be analysed themselves as media (Silverstone 1994:161). It also explains the new configurations added to the coding process to account for the frequent appearance of buildings/space particularly associated with museums.

The "social context" described in the letter anticipates the research into visitor behaviour at science museums in subsequent years (Reading 2003, Heath et al, 2005). Visitors to museums approach exhibits in pairs or groups as well as individuals. The manner in which groups interact with each other or with strangers as well as with exhibits in the same space, relates directly to visitor outcomes. This also alludes to the empowerment theme in several ways, by potentially creating community around a common purpose, changing the nature of communication relationship or expanding the possibilities for how the pedagogical effects might work through social collaboration and input. It also again reflects an aesthetic theme, in

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[78] "Case for National Science Centre", letter from Rosemary Kevany, Director of Discovery group, July 5, 2002

the physical sense of how people are attracted to interactive exhibits in the first instance. But it affirms the potential for layered interactivities including social, object and data modes. Lastly, the 'three dimensional, multi-sensory **interactive** qualities' allude to the immersive aspects of interactivity using *Aesthetic* and *Ludological* themes. The writer states that the museum and school approach while different "are complementary, not mutually exclusive", thus diffusing a point of potential conflict between the constructivist style of interactive science museums and the instructionist approach traditionally used in schools. By using overlapping themes of representation, such zones of conflict can be transcended by allusion to spatial and social as well as pedagogical benefits.

d) The fetish of the science museum

By October 2006, the state's first interactive science museum appears to be underway and "should be up and running near Heuston Station, Dublin by 2009" [79]. A detailed design concept is outlined by the author, Danny O'Hare, now the museum Chairman[80]. The author suggests the interactive science 'centre' will by nature be a more exciting experience than other museums, employing both aesthetic and ludological subthemes, and thus explaining the switch in terminology from 'museum' to 'centre'.

One of the stated purposes of the museum/centre, noted by O'Hare in his earlier article, is to "glamorise science" and make it more attractive to students. This aesthetic quality is different to that described in the previous article. The attraction appears more superficial and aimed at connecting interactivity to other outcomes in other contexts – e.g. choosing science subjects in school – rather than the sensory effects on individual visitors or indeed any immediate pedagogical outcomes.

His exhortative constructivist pedagogical discourse style around interactivity appears again:

> ".. this centre will offer a different and (hopefully) a much more exciting experience. It will not merely be a question of "let's push the button , look and walk away". Instead it will be a real laboratory for learning about all science disciplines, maths and engineering, with workshop spaces to provide opportunities for hands-on experimentation and investigation. **Interactivity** is at the very heart of the concept, and each gallery in the centre will be staffed by people trained to engage the visitor in learning and understanding."

This 'exciting experience' of 'hands on' exhibits and 'interactivity', echoes Hughes (2001) observation of the "fetish of the interactive exhibit". It suggests a commercial subtheme where the value of interactivity is found less in pedagogical effects for visitors, and more in

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[79] As reported in "Brave new world of Exploration Station can light the spark for science" by Danny O'Hare, *Irish Times*, October 17, 2006.
[80] The concept was devised by Californian exhibition design company Gyroscope and an artist's impression is available at http://www.gyroscopeinc.com/ExplorationStation.html [accessed March 1, 2011]

its allure and the visitor numbers it is seen to attract. But the author states the museum will not host a "let's push the button, look and walk away" kind of interactivity, a curious quotation, being unattributed and in the style of 'air quotes'. Its purpose may be to deflect any 'sceptical' discourses around interactivity that might be approaching, a trend found across the sample wherever interactivity is presented in promotional terms.

The interactivity here 'is at the heart of the concept'. Staff are as much part of the interactivity of the museum as the exhibits and the design of the space itself. However, where staff are trained to help visitors to use interactivity – via social interaction – to pedagogical ends, the pedagogical effect may be multiplied, but this describes an instructional rather than discovery style of learning.

The author goes on to describe the museum as a key project in the programme for government, "an essential need in our pursuit of leadership in the knowledge society". This directly alludes to the *Information Society* theme which, although not frequent in the sample overall, was associated with discourses around ICT initiatives. However, it also echoes the Victorian perspective linking education and progress to society's view of itself. The question is if this knowledge society is created by the pedagogical tools available to disseminate knowledge (e.g. an interactive science museum) or whether their existence prove the existence of the knowledge society. The perspective emerging from this article is that interactivity promotes the uptake of science in higher level education and serves information society policy goals, inasmuch as these are measureable. Both the governmental sponsors and the author as museum/centre promoter (and now chairman) are at one in this regard.

The project is described as "a partnership that unites the Government and the private sector". Over half a million euro has been spent, raised from some public bodies and "from individual contributions by members of the Board of Exploration Station". Without any further detail on who is involved, how much is contributed and by whom. questions arise as to which interests may be influential over the pedagogical perspectives in play. If, as this article clearly states, interactivity is at the heart of a concept, which is estimated to cost EUR30 million to set up and a further EUR3.5 million in annual running costs (at 2006 prices), then the precise understanding of interactivity should be an issue of public interest.

In February 2007, the architectural plans for "the state's first **interactive** science centre aimed at children and young adults" were launched by Taoiseach Bertie Ahern[81]. He describes the "stunning" new science museum as complementary to "recent school and third-level based science initiatives funded by Government", saying it would be "the departure point for a voyage of discovery...its mission will be to inspire a lifelong passion for discovery and innovation". This is an overt alignment of the government position on the interactive science museum with the 'discovery' or constructivist pedagogical perspective, but aimed again

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[81] As reported in "Interactive science centre plans unveiled" by John Downes, *Irish Times,* February 6, 2007

primarily at boosting take up at third level, with a little bit of Star Trek thrown in for good measure.

By November 2009, the last reference to the science museum appears ominously in the *Property* supplement, in a feature about the development where the museum was to be built:

> "Given the state of the public finances, there is uncertainty over whether an **interactive** science museum, Exploration Station, will ever be built. Indeed, the OPW-owned site looks almost abandoned apart from its partial use as a carpark for the HSE, the Garda and the Revenue Commissioners data centre."[82]

With that, the idea of an interactive science museum, both in terms of this sample and as a national project came to an end.

e) Discussion – discourse community competition

In some ways, this thread could be divided into the winning and losing discourse communities in science museum promotion. The losing team (Discovery) express frustration that despite efforts to manage delicate political and policy issues, their vision of a deep exposition of the multisensory capabilities of interactivity, as part of a complete museum sensory experience, would not be realised. Placing such strong emphasis on the aesthetic attributes of interactivity in relation to pedagogical outcomes, could also be seen as tacit acknowledgement that this was perhaps a utopian ideal that did not fit with the practicalities of developing a museum in Ireland. The winning team on the other hand (Exploration Station) has more representation in the sample and moves between the constructivist and instructionist perspectives wherever required, while also invoking aesthetic and ludological themes to promote the cause. But it describes an altogether more superficial aesthetic or 'wow' factor attached to interactive science museum visits. There is a clear awareness of the political space within which such a museum might be possible and the concluding position is aligned, either through winner's confidence or compromise, to the political discourse community goal of the 'knowledge society'.

Overall, the discourses revealed in the sample do not explain how or why interactivity is a 'key word' in science museums, employing other ludological, aesthetic, commercial and information society themes instead to build the case. Meanwhile interactivity itself remains largely undefined beyond descriptions of generic physical handling of exhibits. None of the articles for example compare an interactive and non-interactive exhibit for pedagogical design and outcomes. The effects are frequently more promotional in nature, in terms of science awareness generally but specifically in relation to third level take-up of science and to complement government policy. The only defined pedagogical effect of interactivity in

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[82] Eircom's new HQ makes the right connections", by Frank McDonald, November 19, 2009

science museum discourse appears to be a link to trends in educational statistics frequently cited in promotional efforts by governments both in Ireland and internationally.

f) The interactive whiteboards (IWB) thread on interactivity

The second thread in the pedagogical theme concerns investment in and development of ICT in education and looks in particular at discourses around interactive whiteboards.

"The smart board lesson" – by Karlin Lillington, *Irish Times*, September 26, 2008

With thirteen references to interactivity, this article by a technology journalist is the most discourse rich in the pedagogical theme. The main story is an interview with the owners of Smart Technologies, which at the time of writing held a 53% market share in the international interactive whiteboard industry (with 40% of Irish sales) and had just sold their one millionth whiteboard[83]. The article charts their history, progress and future strategy, and is followed by an overview of the takeup of IWBs in Irish schools. The opening standfirst sets the tone for the discourse approach:

> "**Interactive** whiteboards connected to computers are revolutionising education, but now their creators are turning their attention to the corporate market..."

The article is clearly about to extol the virtues this product, but first the directors of the company are introduced:

> "In 1987 when Nancy Knowlton's mathematician husband Dave Martin came up with the idea for an **interactive** whiteboard that could be connected to a computer, the world didn't exactly come banging on the Canadian couple's door."

This statement makes a straightforward point about the development lead-in time, but it also serves a narrative function, presenting the developers, not as a faceless IT corporation, but a regular couple with an idea. The description of the 'couple's door' implies a homespun endeavour, conjuring up visions of Dave the boffin tinkering with cables and screens in the attic. The reference to 'mathematician husband' alludes perhaps to a confidence exchanged between 'Nancy' and a female technology journalist that even she was sceptical about what he was up to. This sets the tone for the rest of the article and also a narrative hook for readers – was he crazy or did they succeed?

The repetition of the technical configuration – 'connected to a computer' – implies that interactivity was initially considered to be between whiteboard and computer. The operating

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[83] See http://smarttech.com/

definition is that interactivity is a characteristic of the medium. At their first trade show, the couple were surprised that only school teachers showed an interest, an admission that the product was not initially designed for the pedagogical market. But because teachers *got* the concept of an **interactive** whiteboard, they became the target market.

g) Interactivity as the game changer

> "**Interactive** whiteboards are made with a touch-sensitive material that enables the entire board to become a giant touch-screen for any computer attached to it."

This reference presents an empowerment subtheme around interactivity, detailing how the technology empowers the screen by changing it into something else, a transfiguration from ordinary whiteboard to 'giant' accessory. But while the idea works, the impetus required is large scale endorsement and investment, which came in 2003 when the UK government decided "to set aside £50 million to buy **interactive** boards". Intel taking an equity stake was another valuable investment but crucially also an endorsement of the concept by a major IT industry player, moving it from quirky invention to potential game changer.

Like science museums, IWBs need private money, public endorsement and government investment to really gain a foothold because they aim to change the way a communication event is traditionally managed. The change is the concept of taking "information that had been personal and private (on a PC) and opening it up to a room". This adds another layer of interactivity, that between private and public and between information and groups, widening the sphere of communication from machine, to data to others. It also involves students as participants who "come forward and **interact** with the board in a more dynamic way that with a blackboard".

This 'dynamic' attribute is found frequently throughout the coverage, as a distinguishing feature of IWBs, differentiating them from 'static' blackboards. It is literally the 'killer app' according to a member of the educational technology discourse community cited elsewhere in the thread, because "the blackboard is dead" [84]. The static vs. dynamic, black vs. white dualisms are laden with aesthetic and empowering subthemes. But the most dominant empowering aspect of interactivity here is the change in relationships, in this case turning traditional pedagogical roles inside out – "we make students the teachers" says Knowlton – invoking a mild critical pedagogical discourse, seeking to question and invert traditional teaching methods and roles. This also alludes to 'collaborative learning' discourses, which a number of studies have pointed to the role of ICT in supporting (Becta, 2003). However,

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[84] Jerome Morrissey, director at the NCTE, quoted in "Bill Gates and the new frontier", by Ali Bracken, *Irish Times*, February 6, 2007

these studies show more potential for this style of pedagogy than successful outcomes, with actual collaboration consistently reported to be minimal (ibid:p.24).

The whiteboard CEO next presents a constructivist pedagogical outlook, stating that the didactic style of lecture "may have worked when you had the 'sage on the stage' versus the 'guide on the side' – a rhyming couplet describing the change for readers to take away. Their technology promotes "show rather than tell", where "children are building models of knowledge", the most overtly constructivist statement yet.

Now that the the pedagogical event has been examined, and the pedagogical perspective confirmed, the outcomes are outlined. The CEO cites (unnamed) studies showing "one of the single best things teachers can do to accelerate learning is simply to slow down", facilitated by the large movements required to use an IWB. Further studies from the UK and US indicate widespread support amongst teachers and students for both pedagogical and classroom management reasons - "96% in a Minnesota district felt using a IWB made them a 'more effective teacher'", while "student behavioural problems diminished when using the boards during lessons". The research cited is qualitative teacher and student opinion surveys rather than quantitative results based studies and reflects the teacher 'appeal' noted in the literature. The main negatives with the technology are stated as teacher acceptance and cost – both surmountable according to author and interviewee. The CEO acknowledges that "teachers can find the shift to **interactive** boards challenging" so the author cites an Irish website, operated by the main distributors for Smart Technologies in Ireland, where support is available[85]. However, the 'Teacher Zone' of this support site not only provides instruction and troubleshooting on using IWBs, but also template lessons and tools for use. Offical product brochures are also available, describing the software which includes "curriculum-specific clip art and templates that support math, literacy and science," indicating that teachers can 'build' lessons from the material available[86]. Therefore, Smart Technologies is not just an IWB builder but a content developer, which makes its perspective on the pedagogical theme more pertinent. It also raises questions as to the homogenising effect the technology and content may have on classroom experiences, akin to the concerns expressed over homogenised science museums.

The question of cost is left to those investing in ICT in Ireland, which is said to 'lag behind' the UK and US in whiteboard use, implying catch up is required. The article then reports that the company is switching focus from education to business, from classroom to boardroom, "...visiting Ireland and Britain to launch a marketing push". The question arises as to whether this article is news or also a part of that push and how many technology journalism articles

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[85] http: //www.smartboard.ie

[86] E.g. The smartboard sb600 brochure is available as pdf download from http://www.smartboard.ie/product-sb600-series-front-projection.php [accessed March 10, 2011]

could be said *not* to contribute to marketing. A ludological subtheme is introduced on a final promotional note, that if this corporate drive is successful, meetings might go on longer due to "executives having too much fun playing with the boards".

h) The local context – IWBs in Ireland

An accompanying subarticle presents an overview of ICT roll out in Irish classrooms: – "Whiteboards: take-up in Irish schools slow". The opening statement sets the context, where "**interactive** whiteboards have become ubiquitous in schools, especially in the United States and in Britain". Figures from the Irish school system are 'sketchy', according to the author. The most recent cited date from 2005 (still the most recent at the time of writing this analysis) which show a quarter of schools had invested in interactive whiteboards – a take-up 'significantly' behind Britain, the most comparable market.

The National Centre for Technology in Education (NCTE), whose figures are cited, provides advice sheets on various ICT issues for schools, including a seven page document on IWBs (NCTE 2008). The introductory paragraph – 'what is an interactive whiteboard?' – states that an IWB is a "large, touch-sensitive (thus interactive) board that...facilitates interactive ICT engagement". The NCTE sees interactivity as a characteristic of the medium, with low level empowering properties in how it 'facilitates...engagement'. However, they stand neutral on the pedagogical benefits, stating that:

> "From the research available, it seems clear that the **interactive** whiteboard is widely considered to be a positive asset to the classroom. However, it is not without its problems..."

The pedagogical benefits are reputed rather than proven. Technical support issues and a steep learning curve are the issues to the fore. The appendix cites research into IWBs in particular by the UK government agency Becta, but also several studies by UK universities and one Irish research paper, mostly qualitative studies based on surveys of teachers and students on their experiences of IWBs[87]. The rest of the document deals with technical details, support services, examples of use and cost issues.

The article notes problems with ICT in Irish schools around the training of teachers but also, ironically, around *lack of interactivity* between different technologies - "...the two best-selling **interactive** whiteboards cannot work with each other". Here the lack of interactivity is disempowering – deliberately so where technology providers ensure lack of compatibility to protect their market. Where schools are forced to go with one supplier only, costs rise. The

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[87] "Research on interactive whiteboard technology" published in *Education Matters,* December 2007, available at http://www.educationmatters.ie/2007/12/04/research-on-interactive-white-board-technology-launched/ [accessed March 10, 2011]. The specific IWB report from Becta is no longer available – Becta was closed in January 2011 – but a general report on ICT and Pedagogy, cited in the references for this analysis, covers the issue and is archived at http://www.education.gov.uk/schools/adminandfinance/procurement/ict/a0073825/becta [accessed March 10, 2011]

final sentence states that Smart became the 'largest' player in the Irish market that year, possibly implicating their products in this practice, the only negative note in an otherwise positive promotional piece.

Overall, this adjoining article is a straightforward critique of ICT investment in education in Ireland, citing poor national figures compared to other countries. But cost is not discussed as an issue around investment in IWBs specifically in this article, although it is elsewhere in the thread[88]. Discourses around interactivity here are restricted purely to the communication event and the technical integration issues between boards. But being published alongside a relatively positive promotion of an ICT provider in advance, makes it difficult to separate this subarticle from the 'marketing push' noted by the author. The hortatory style also emerges in references to external international pressure to compete.

The NCTE advice sheets on ICT recommend 'effective alternatives' to IWBs such as low cost fixes and fixed digital projectors, suggested as a 'higher priority' in classrooms. Similar alternatives are suggested in another article just three weeks earlier, which describes a cost effective 'hack' for building your own IWB for EUR 50 using a projector, a remote control from a Nintendo Wii console and some free software[89]. Therefore, the change effected by IWBs in educational (and business) communication is possibly permanent but not necessarily under the control of the IT industry players who supply the technology or at the behest of governments to invest. This is underlined later in the thread, where the Minister for Education stated she was "not convinced" about the value of providing IWBs in classrooms. It is worth noting that she is a former teacher and so her discourse community membership may be influencing her perspective. Her comments appear personal as much as policy driven or research based.

> "A good teacher is a good teacher with a blackboard or a whiteboard, and a bad teacher is a bad teacher with a whiteboard or a blackboard."[90]

Over time and across various countries, the educational environment has provided the testing ground for IWBs is a 'positive asset' in a pedagogical sense, at least in the opinion of teachers. The interactivity is within the potential of technology and transcends formal cost structures but how IWBs get into the classroom is another story. So Dave isn't crazy, his insight was correct and IWBs did take off. However, the IT industry is fully aware that the future lies for them in proprietary software rather than the 'interactive' hardware for the classroom, boardroom or anywhere.

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[88] "The ill fated IT 2000 programme which was designed to update classroom technology was allowed to peter out..." in "Whiteboards take world by storm" by Mike Butcher, *Irish Times*, September 5, 2008
[89] "Whiteboards take world by storm" by Mike Butcher, *Irish Times*, September 5, 2008
[90] "Hanafin rules out spending EUR 167m on secondary laptops", by Michael O'Regan, *Irish Times*, October 3, 2007

i) The e-learning industry thread

The final thread follows the trajectory of Irish software companies in the international e-learning market from the late 1990s onwards, which dominate the coverage on e-learning. Thirteen articles followed the journey of CBT, a producer of '**interactive** training for business', from the top of the Nasdaq technology stocks listing to the bottom on the eve of the dot com crash[91]. Meanwhile, a spin off company from CBT called Riverdeep focused on interactive education software for schools and was followed in ten articles through the dot com boom, bust and subsequent stabilisation. The articles selected for analysis are strongly representative of discourses around interactivity in relation to commercial e-learning industry. First Riverdeep, explains how and why they are making an impact in the nascent e-learning market. The US government has committed to spending on IT, the market is growing and the product can be adapted for use anywhere, all of which describes a sound business case for floatation on the stock market.

> "[The software] structure means that programmers can easily slot out American voices and references on the multi-media software replacing them with European languages and terms of reference…The programme contents are overseen by education specialists with experience in the US system. Using graphics, sound and **interactivity**, they are designed to be of particular use to weaker students who have fallen behind their classmates, as well as for exceptional students that need extra stimulation. The software also conforms to standards laid out recently by the US government."[92]

The localisation of education products is represented as simply a matter of replacing language and terms of reference, rather than adapting to specific cultural and pedagogical approaches to learning, which indicates perhaps a lack of pedagogical theory informing the story. The term 'slot out' – a relexicalisation – makes the process sound simplistic. Interactivity is presented as an aspect of the content of production rather than a feature of the technology as it is with IWBs in the classroom. It is part of software design which assists both the weak or exceptional student, to either catch up or stay interested, addressing complete market potential. The interactivity here is purely instrumental, an extra layer for learning in a sphere of communication restricted to student and software and no further. That it conforms to US government standards reads as a reassurance for potential future shareholders rather than a description of pedagogical policy or influence.

The pedagogical aspects of interactivity presented relate purely to the markets in which the products are released and the contexts in which they are used. The context is not specifically classroom oriented either as another article notes that their products are delivered "over the

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[91] As reported in "CBT profits up 217%" *Irish Times,* April 1, 1996 and "Final quarter profits in nosedive at CBT" *Irish Times,* January 20, 1999. It subsequently rebranded as Smartforce and stabilised.
[92] "Riverdeep aims for Nasdaq listing" by Sean MacCarthaigh, July 27, 1998

internet into classes and into homes"[93]. Where the market and communication process differ from the IWB thread is that it is very much student centred, with teachers receiving little or no mention throughout.

The next article describes CBT's decision to switch its workplace training business "into an **interactive** Internet-based concept" [94]. This shift from CD-rom to internet delivery triggers a massive share sell off due to investor concerns about the strategy in the US, wiping out almost half of its value in a single day. CBT had been regarded as "the market leader in **interactive** information technology training" just two years previously[95].

The company attributes the unusually strong reaction to the fact that investors "clearly don't like surprises" rather than any technological reason for concern,. Dublin based 'analysts' state that while it is a 'bold' strategy that 'makes sense', it will be some time before the market recovers. Their perspective focuses purely on share price impact rather than strategy and is compared with more negative sentiment from US analysts. The differences are attributed to CBT being regarded as 'educational and training' stock in the US, while viewed as IT stock in Europe. This difference in categorisation is significant in terms of the discourses that are likely to be relevant and explains why the Irish coverage reflects a *Commercial* subtheme alongside the *Pedagogical* one. It suggests that the understanding of and 'value' associated with interactivity, while relatively well established in the broad IT sector, was less so in the educational publishing and training market. It also illustrates how the analyst community enters into discourses around interactivity.

The company describes its bold strategy is as "a faster and more **interactive** way of learning through the internet." This assertion goes unchallenged in the article. Indeed the analysts have already given their approval to the 'new strategic development'. There is no explanation as to why it is more interactive apart from the implication that the internet is more interactive than the previous delivery method of CD-rom. This may distantly allude to the industry-wide disappointment experienced when the vision of interactivity promised by the CD-Rom failed to live up to the 'hype'. But it also indicates that the IT industry was still very much invested with the concept of interactivity using it, along with speed, as the qualitative measure of new technological strategies for product and service delivery, primarily over the internet.

It is striking that while these companies reflect the sizeable value of the educational software industry (and the value of 'interactive' learning), the statements made around the pedagogical value of interactive software are mostly superficial and discourses are relatively uncontested. The focus instead is on the change in product delivery from CD-rom based libraries of titles to internet-only content. Scepticism over the strategy led to share collapses and it was some

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[93] "E-learning company to create 450 jobs", by Ciaran Hancock, *Irish Times,* September 11, 2008
[94] As reported in "CBT shares lose $510m as investors reject new strategy" – by Siobhan Creaton and Bill Murdoch, *Irish Times,* October 20, 1999
[95] According to Goldman Sachs company report, cited in "CBT systems in strong market position", *Irish Times,* August 11, 1997.

time before the market stabilised again. The significance of the thread on these two companies is how their success as commercial enterprises impacts on discourse around the pedagogical aspects of interactivity. Their sustained coverage also reflects a focus on shareholder interests, no doubt a relevant group of readers.

j) Conclusions on the Pedagogical theme

This theme presents a number of perspectives bound up in tensions emerging from diverse approaches to pedagogy in both theory and practice in the public and private sector. Behind these perspectives are the many discourse communities across the spectrum: science experts and popularisers, museum promoters, public servants, politicians, technology hardware companies, educational research bodies, teachers, software designers, educational software companies, industry analysts and the variety of specialist and generalist journalists who contributed to the threads. The one discourse community missing from the sample represents those most likely to be participants in interactive communication events for learning – students.

The context of communication is relevant to the *Pedagogical* theme. Science museum discourses are dominated by 'hands on' constructivist theory but the *Aesthetic* and *Ludological* features of interactivity are also utilised for their application in a large immersive science museum venue. Even Victorian perspectives exert their influence, through the architecture and exhibition display techniques still in use, but also in the frequent association of science museums with progress in society. The more intimate classroom setting focuses attention on how interactivity transforms teaching and learning roles and relationships, noting a minor *Empowerment* theme. Interactivity is appealing because it contributes to the harmony required for class management and a sense of progress. Finally, interactivity is expressed as an extra feature or tool in the relatively private interaction between learner and software, on- or offline. It is also however a general business strategy, particularly associated with online learning, suggesting a strong *Commercial* theme in terms of outcome.

Irish, UK, US and European research and examples are cited throughout and differences emerge in how international experiences influence Irish discourses around interactivity. Irish ICT in classrooms policy leans towards UK perspectives, while the Irish e-learning business is focused on (and has well developed expertise in) the US educational market. Science literacy is presented as equivalent to science 'awareness' rather than 'appreciation', which appears to follow a US rather than European outlook (see Gregory and Miller 1998). But European science museum examples are cited frequently for comparison.

Although theoretically part of the same discourse community, science museum promoters are presented in competition with each other to present a winning formula for interactivity that attracts government funding. The winner is not the *Aesthetic* sensory experience that

162

complements science education in schools, but the *Ludological* 'wow' factor that 'glamorises' science for the 'kids'. Linking the latter to promotion of the 'knowledge society' seals the deal and the promoters and government converge on discourse style. Similarly, while the educational software companies, industry analysts and business journalists may have different goals in relation to e-learning discoursees, their perspectives on the pedagogical aspect of interactivity are almost identical. It is not relevant because interactivity is a business strategy and its value is measured in market results, thus relying on the *Commercial* rather than *Pedagogical* theme to prove its case.

In all coverage, the interactivity of the pedagogical event is relatively well described as is its impact on pedagogical styles and contexts. But the links between interactivity and pedagogical outcomes are not clear. The theme cannot explain by itself how or why interactivity has pedagogical benefits without using further themes in support.

CHAPTER 8

Discourse Analysis II:

Aesthetic, *Ludological* and *Futuropia* themes

8.1 Analysis of the Aesthetic theme

This theme covers a variety of perspectives which address interfaces, relationships within the communication process and philosophical enquiries as to the nature of user, audience, author, interface, text, narrative and so on.

a) Interactive art, science and multimedia discourses

This analysis begins with an article from early in the sample about how an artist uses technology in her work. Interactivity is referenced only once directly, but is present thematically throughout the discussion on the uses of technology in art.

"The eyes have it" by Michael Cunningham, *Irish Times*, April 20, 1998

This article combines an exhibition review with an interview with the artist Grace Weir, who incorporates digital tools and technological themes into her work. Weir explains an artwork comprising a projected image and trackball device and explores her thinking around technology, narrative, creativity and interactivity:

> "When the viewer rolls the trackball, it's an unfolding of events in real time. Any work is about the unfolding of events in the real time of the human body. It's to do with the lived experience of the body. And I'm not interested in the idea of so-called **interactive** media where there's no author and so on - I'm the author, I'm still telling a story. I'm wary of those debates. And the piece is not about QuickTime VR, the technological aspect of QuickTime VR - it's about the middle of a circular image where there's no beginning or end to it. Technology on its own doesn't interest me - it's what we do with it that interests me."

The artist clearly attributes the aesthetic experience to the physical and psychological impact on the audience of a process of which the audience is also conscious. But despite this consciousness of process, and the use of technology and the physical handling required by the installation, she pre-empts any attempt to categorise it as merely 'interactive media'.

At first, her reference to interactivity appears sceptical. She uses the term 'so-called' to give it a particular meaning she evidently disagrees with, and which she ascribes to another unnamed discourse community. However, her use of the phrase 'interactive media' along with her statement of interest in technology's uses, suggests that she does not dismiss interactivity itself, just 'those debates' that treat it purely as a characteristic of the medium rather than a

function of design or what is 'done with' technology. That she is 'not interested' in these debates and ideas, is more than just a statement of her position on the matter. It reinforces her assertion of control over the 'unfolding of events', as an artist dictating the aesthetic experience, very definitely the author still telling the story. Her scepticism is centred on the ideas associated with interactive media rather than the interactive technologies themselves. Weir's reference to "no author" alludes to poststructuralist ideas circulating at the time on how the interactivity of digital media might represent the death of the author (after Barthes, 1967), by empowering readers/users/audiences to interact and shape the 'unfolding' text. Her rejection of this thesis is not a rejection of interactivity in itself but rather the idea that it undermines the authority of the artist, thus asserting that art (and indeed all communication) is not a game of equals. Even if the audience can physically trigger, shape or respond to the work, the artist is ultimately in control.

> "I'm not interested in the way a vast amount of multimedia has so many things happening as quickly as possible. I wanted to strip it down and edit severely. The technology exceeds our philosophical ability to deal with it." She quotes philosopher Paul Virilio on how the Internet collapses our sense of physical distance and attacks Renaissance notions of perspective."

The particular Virilio quote is not cited, but many of his ideas are relevant to the discussion. Being essentially a phenomenologist, issues surrounding subjective experiences and audience reactions to art and technology are central in his work. But his views on interactivity are of particular interest here, not least because of his strongly negative perception of it. Indeed Virilio (1995) posits interactivity as a catalyst for the disintegration of society:

> "Interactivity is to real space what radioactivity is to the atmosphere"[96]

Virilio suggests that the facility to shrink distances between places and people and to speed up processes (which Weir is possibly alluding to in the article) makes interactivity a central component of the 'information bomb' or 'cyberwar' which will eventually lead to a catastrophic 'rupture'[97]. This is the 'integral accident' that all new technologies contain, or the unforseen side effects of a technology, first introduced when the invention of the railway also produced 'derailment' (see Armitage, 2000 on Virilio's theory).

While not directly cited, Virilio's views are clearly influential for the artist and important for this analysis in several respects. First, it serves to clarify that aesthetic perspectives on

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[96] Virilio in conversation with James der Derian 1995, published online at *Dialogues* available at http://www.watsoninstitute.org/infopeace/vy2k/futurewar.cfm
[97] Virilio suggested that the Kosovo war and the Asian financial crisis of the late 1990s were but the first signs of a future 'integral accident' to be brought about by interactivity, as outlined in conversation with John Armitage, October 18, 2000, published online at ctheory.net available at http://www.ctheory.net/articles.aspx?id=132. See also Armitage (2000).

interactivity are not always positive nor focussed exclusively on how interactivity facilitates communication but how it might also detract from it. Weir is conscious of retaining control of the message regardless of the potential of the technology. Secondly, Virilio's view of interactivity goes beyond individual communication events to the collective impact of successive and multiple interactivities, an avalanche of information and feedback, which as Weir observes may exceed our "philosophical ability to deal with it". It is worth noting here that the image she projected in the installation was described by the article author as appearing to show "the aftermath of some catastrophic flood". This is perhaps a play on the notion of a flood of information and other themes circulating around its creation. Thirdly, by invoking Virilio and Barthes as well as Gleick's Chaos theory and other interdisciplinary ideas through her comments on interactivity, technology and art, Weir may not only be displaying an awareness of theoretical discourses but also sympathy towards them. This suggests that these strands had currency generally in the art/technology discourse community of the late 1990s. She sees the artist as a bulwark against the flood, whose role is to control and edit technological potential for the audience.

In a similar vein, another article from the sample quotes American sculptural installation artist Peter Shelton who was also exhibiting in Ireland in 1998, where the author discusses restrictions the artist placed on the interactivity allowed between artwork and audience:

> "In the past, his work has incorporated substantial **interactive** elements…It seems however that Shelton has more recently been at pains to remove some of the toy-like qualities of his previous works. "If you make something like that," he says," people are apt to confuse the gallery with a playground." This apparently is a bad thing. **Interactivity** these days is of a subtler kind."[98]

Shelton restricts the potential for interactivity in his work, therefore controlling the activities of the audience and ultimately shaping the experience of the artwork. The minor *Ludological* (or perhaps *Hula-hoop*) theme which arises here suggests that the playful aspects of interactivity may not be considered appropriate in the serious environment of an art gallery. This reflects Baudrillard's (1997) then recent assessment of interactivity in art:

> "…some new museums, following a sort of Disneyland processing, try to put people not so much in front of the painting – which is not **interactive** enough and even suspect as pure spectacular consumption – but into the painting….The masses usually prefer passive roles and avoid representation. This must change, and they must be made **interactive** partners. It is not a question of free speaking or free acting – just break their resistance and destroy their immunities." (1997:p22)

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[98] "Tubes, chambers, pipes and arteries" by Luke Clancy, *Irish Times*, March 26, 1998.

This is a serious criticism, implying that interactivity not only has a simplistic commercial impetus but also a technological force which is bending audiences not to the artist's but to the museum or gallery's will. (It also associates the Disney corporation with a particular style or discourse in aesthetic experiences of interactivity, addressed further under the *Sceptical* theme). But Baudrillard's description of what the masses 'usually prefer' does not reflect Shelton's or Weir's approach to their work which is still targeted at individual audience experiences. In fact, Weir is attracted to the more playful and sympathetic attitude of museums and science galleries towards technology and art rather than the more formal atmosphere of art galleries. She notes that science "embraced the use of multimedia in those kinds of spaces far more effectively than art galleries".

Perhaps the emphasis on play or the ludological aspects of interactivity are a more comfortable fit for Weir than focussing on its aesthetic values. Work that crosses the divide between science and art was still a novelty in the Ireland of 1998. The Science Gallery, a dedicated space for such exploration, opened in Dublin only in 2008. So Weir is forced to address the aesthetics of interactive art elsewhere. But her attraction to science and awareness of and allusion to cultural theory is inevitably also connected to the origins of the work in the show discussed in the article. The author notes it was first produced for the graduate show of "TCD's new MSc multimedia programme" which locates its genesis in a very specific cultural and educational discourse space.

Trinity College Dublin was the first university to offer a degree programme in multimedia in Ireland, the MSc in Multimedia Systems in 1996[99]. The course grew out of research work into multimedia applications in the computer science department at the university, an area which had been gaining ground worldwide. The multidisciplinary programme recruited graduates from a wide range of disciplines, from art and computing. Despite being housed in the department of computer science, there was a "significant emphasis on theory", not just on applications[100].

The theory explored on the course included standard multimedia texts such as McLuhan (1994), Nelson (1992), Laurel (1993) and Murray (1997) but also hypertext theory such as Borges (1962/2003) and Landow (1994) and the hypertext works of Joyce (1990) and Moulthrop (1987/2003)[101]. The latter frequently form the basis of 'interactive narrative' modules which became standard content on many multimedia degree courses in Ireland and

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[99] In 2010 the course name was changed to MSc in Interactive Digital Media and the school name changed to the School of Computer Science and Statistics, which adds an extra layer of discourse complexity to this analysis. Multimedia was perhaps considered dated and still invokes images of desktop computer and mouse while interactive media is thought to include a more wide ranging array of sensor, contextual and haptic devices. The first multimedia degree course in Europe was the undergraduate degree in Digital Media at FH-Furtwangen University in Germany launched in 1990. See http://www.hs-furtwangen.de/fachbereiche/dm/english

[100] Course overview 1998/99 – available archived online at **http://www.cd.tcd.ie/courses/mscmm**

[101] As detailed in the 'interactive narrative' reading list, obtained from course archives. See note 100.

elsewhere and strongly influenced ideas around the connection between interactivity and hypertext among the multimedia community[102].

b) Interactivity and hypertext

The hypertext aspect of interactivity is traced back to its roots in another article from the sample in celebration of Bloomsday: 'Portrait of the Artist as Webmaster' by Karlin Lillington, *Irish Times* June 16, 1998. The author describes James Joyce as the "Patron Saint of **Interactivity"** due to his hypertextual literary style and outlines how the emergence of hyperlinking on the Web has led researchers to rediscover Joyce and hypertext theory. Hypertext author and poet Michael Joyce is quoted, asking "Is there a more multimedia work than *Ulysses*?" and suggests that James Joyce would have been drawn to the 'polyphonic qualities' of the web. However, the complexity in transferring Joyce's hypertext works to the hyperlinked world of the web forces both Joyce the hypertext theorist and Joycean scholar Rob Callahan to think again:

> "They are both wary of attempts to take the father of hypertext and force hypertext upon his prehypertext – in other words, to create **interactive** versions of Ulysses and Finnegans Wake. Michael Joyce believes this would force the text to be what it is not, that despite the non-linear structure of Ulysses, the fact that it is written as a sequence of pages, in print, is essential to it as a work of art. Callahan acknowledges the way in which the **interactive** element of hypertext can be distracting…"one of the concerns is that such a translation might actually flatten the texts once a reader is faced with a screen-full of bright hyperlinks whereas she previously had to intuit and construct her own connections"…"

The article author describes interactivity as a 'version' of a text in which it is converted it to hypertext, meaning the text can also exist in a non-interactive state. Interactivity lies in what is done to and with the text. Her interviewees give different reasons for being wary of interactivity by exploring each other's field of interest – the hypertext author believes the material integrity of the original work should be preserved while the Joycean scholar is concerned that displaying the hyperlinks would dilute the hypertext reading experience. Both clearly associate interactivity with hypertext, but as produced on the web through its native digital facility of hyperlinks rather than the analogue hypertext of Joyce. The overall assessment is that taking interactivity to its limit may again have a negative aesthetic effect for the user/reader rather than the positive one that might be assumed. Again, the author's control asserts itself over when and how the audience/reader/user experiences the work.

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[102] The first undergraduate degree in multimedia in Ireland was offered by Dublin City University in 2000 and included a module 'mind /machine/ narrative' until 2009 with a similar reading list. See also MIT courses on interactive narrative theory as taught in 2003 at http://ocw.mit.edu/courses/writing-and-humanistic-studies/21w-765j-theory-and-practice-of-non-linear-and-interactive-narrative-spring-2003/readings/

In fact, attempts to translate Joyce's works into hyperlinked online texts since the late 1990s have been met with more legal than aesthetic or technological barriers, due to the zealousness with which his estate guards copyright. This led to the Irish Government enacting emergency legislation in 2004 to allow an exhibition (including 'interactive' displays) on Joyce and *Ulysses* at the National Library of Ireland to go ahead in celebration of the centenary of Bloomsday[103]. The legislation covers 'displaying' certain works, but is not specific about hyperlinking or interacting with them. Neither activity proved litigious in the event however, as another article from the sample describes the exhibition thus:

> "Much of the display is **interactive,** in a most exciting fashion; a visitor will be able to turn the pages of Ulysses virtually, to home in on a particular episode or passage, and to learn much more about it through touch-screen technology."[104]

We have returned to an empowering representation of interactivity, acutely so with regard to Joyce's *Ulysses,* because of its perceived impenetrability for non-literary scholars but also due to the lack of physical public access to manuscripts of production, until the legislation enabled the exhibition to take place. Access enabled via interactivity is presented here as right of citizenship given protection in law. The public is empowered also to interact with the text in ways they could not with the analogue original and the pedagogical aspects of the 'touch screen' means that *Ulysses* can finally be understood – well, almost.

Interactivity is also presented in an 'exciting fashion', again part of the fetish of museum display techniques which relies on the perceived aesthetic effects for visitors of turning the page, touching and 'homing in' on personal selections. At the opening of the exhibition, the late former Taoiseach Dr. Garret Fitzgerald expressed frustration that he could not take the interactive exhibits home, to 'home in' further on the seemingly endless depths to which *Ulysses* could be examined, as there was not enough time to do so in an exhibition visit[105]. The law would not allow for this, but neither would the technological or the aesthetic aspects of the interactivity, housed in a networked series of touchscreens and computers embedded into the exhibition design. The interactivity was a public rather than private experience, both by law and by design. This sense of immersion that interactive displays facilitate is another aspect of the aesthetic theme, encapsulated in a comment from the visitor's book to the exhibition of da Vinci's *Codex Leicester* at the Chester Beatty Library in 2007:

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[103] The *Copyright and Related Rights (Amendment) Act 2004* – *"*An act to remove doubt as to the lawfulness under the Copyright and Related Rights Act 2000 of displaying certain works in public". See also "Emergency law to prevent copyright threat to Joyce show" by Mark Hennessy, *The Irish Times*, May 27, 2004.
[104] As described by Terence Killeen, author of *Ulysses Unbound*, reviewing the exhibition in "Behind the words", *Irish Times,* June 12, 2004.
[105] In a personal comment to the author (then project manager for interactive installations) – Dr Fitzgerald also vowed to pursue the National Library to develop portable versions of the interactive exhibits, for when copyright expires in January 2012.

"…the brightly lit IT **interactive** demonstrations kept us there longer than we thought we would be able to last."[106]

Some objects appear destined for interactive digital exploration. Both the analogue hypertext of Joyce's *Ulysses* and the analogue multimedia of da Vinci's *Codex* seem ideally suited to a communication style which provides access (*Empowerment*), exploration and explanation (*Pedagogy*) but most of all a sense of connection with and appreciation of creative concepts and ideas from another time, in other words, an *Aesthetic* experience.

c) The aesthetic touch

Museums and the cultural and social implications of the aesthetic aspects of interactivity are also the focus of a later article from the sample, featuring an exhibition on Ireland's military history at the National Museum in Collins Barracks: 'Hands on at Collins Barracks' by Shane Hegarty, *Irish Times*, March 4, 2009. The author describes his experience of handling a rifle "while a drill sergeant shouts instructions" – the rifle is a replica and the sergeant is on screen:

> "This is part of an **interactive** addition to the museum that will give the public a hands-on experience of what barracks life was like for a soldier in the 1890s and in 1942. Although it's not so hands on for everyone apparently. "The Irish can be a bit shy" says Lar Joye, curator of the museum's *Soldiers and Chiefs* exhibition. "The tourists are usually much more eager to give it a go, but the Irish aren't so sure"…"

One of the unpredictable aspects of designing touchable exhibits is whether people will actually want to interact. If the potential for interactivity is there but visitors do not participate and only observe the linear aspects of presentation, is the exhibit still interactive? Some visitors prefer to watch while others interact, but are they still participants in the communication too?

The idea that interactivity can be associated with different cultural identities is even more significant and raises some questions about curation and design, which allude to the aesthetic aspects of interactivity. The quoted curator wrote extensively about the design of the exhibition and the challenge in presenting Ireland's complex historical relationship with the military[107]. However, he made no comment on the curatorial choice of guns as an interactive interface. Yet, rather than being shy about interactivity, perhaps Irish visitors are more reticent than their European counterparts about handling guns, because weapons have a particular socio-cultural context in Ireland[108]. Some of the other interactive exhibits in the

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[106] "Crowds flock to the da Vinci codex" by Deirdre Falvey, *Irish Times*, July 14, 2007
[107] See 'Interpreting and designing *Soldiers and Chiefs*', by Labhras Joye and Paul Martinovich, *Museums Ireland,* Vol. 16, 2006, Irish Museums Association.
[108] Joye and Martinovich present a detailed analysis of the complexity of the historical relationship with the military. Modern Ireland's gun licensing laws, lack of military service, unarmed police force and associations of guns with

exhibition did prove popular however, in particular the Stokes Tapestry, as described in a review of the exhibition on its opening:

> "…an **interactive** point…allows you to animate the tapestry and have the drunken revellers at Donnybrook Fair beat each other up and activate a solemn march at a Dragoon's funeral. This makes everybody five years old, and buoys us up for the horrors of the religious wars of the seventeenth century and the awful atrocities of 1798…"[109]

The *Hula-hoop* theme arises as a complement to the aesthetic effect of a table top interface, whose playfulness is light hearted but effective in preparation for the next more difficult adult step on the exhibition route. Interactivity has an emotional impact, perhaps more so as the interfaces used move even further away from the impersonal kiosk and touchscreen technique.

d) The age of interactivity

Similar socio-cultural issues around interfaces arise in an earlier article from the sample, reporting on "an **interactive** exhibition that subverts the roles of asylum seeker and citizen" taking place in France[110]. The exhibition asked visitors to take part in a 'giant role play game' to experience life as a refugee, where they are met by soldiers, bureaucrats, smugglers, aid workers and so on. A minor *Ludological* theme arises in the game play aspects of the exhibition structure. But the impact was mostly described as highly personal and emotional for visitors who frequently came to identify strongly with their character. Of particular interest is the difference in reaction from visitors, depending on their own ethnic origin. French natives felt shocked and 'uneasy' while some immigrants felt empowered by the parallels to their own experiences. Tourists compared the aggressive officialdom they met as refugees to the more polite experience of the tourist, while actors (some immigrants themselves) playing police and administrative officials were surprised at how they 'plunged' into their roles.

Some aesthetic aspects of interactivity are subjectively experienced and perhaps can only be subjectively measured through perception of what the interactivity contributed to a communication event. The characteristics of a person's identity, whether their socio-cultural or ethnic background or their life journey up to arriving in an exhibition space, may all contribute to this subjective experience of interactivity. This could be seen as a variation on

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paramilitarism may produce a different attitude to handling weapons than other nationalities. The article author notes that a Spanish family go through their drills at the exhibition and are 'not put off by the Irish language orders'. Spaniards would have a more recent experience of a military state and a different set of cultural values around gun use. Space does not allow for the development of this aspect further, but there is clearly more analysis to be done on curation of objects as interfaces for communication in museums.
[109] "Soldiers and Chiefs: The Irish at war at Home and Abroad from 1550, National Museum of Ireland, Collins Barracks" by Catriona Crowe, *Museums Ireland,* Vol. 17, 2007, Irish Museums Association.
[110] As reported in "Oppressed for a day" by Veronique Mistaien, *Irish Times,* April 17, 1999.

active audience or reception theory in media studies (see Hall, 1980, Morley, 1980, 1992, Livingstone 1998) where individual visitor characteristics and behaviours are pertinent to mediated communication outcomes. Indeed the 'text' of the experience had cultural and ethnic difference 'encoded' into it in order to provoke shock and surprise as an exhibition aim. This provides further support for the argument that museums can and perhaps should be regarded as media for the purposes of research, not least because of their perhaps more sophisticated understanding of the potential for interactivity.

Taking socio-cultural characteristics further, there is some evidence from the sample that interactivity has associations with gender which might have an impact on how aesthetic aspects are experienced. Interactive communication, even on a social rather than digital level, is not considered an inherently male characteristic. A male letter writer from 2002 concerned about representations of masculinity in society associates it directly with feminine communication styles:

> "Culture is everywhere becoming more feminised. Male psychology is frequently deemed inherently aggressive and reactionary, the source of violence in the home and in society. Physical strength, reserve, stoicism, control, objectivity must cede ground wholesale to emotivism, subjectivity, feelings and communication skills in an age of networking and **interactivity**."[111]

The writer sees interactivity as a feature of the 'style' of modern communication culture, part of a new aesthetic, native to feminine rather than masculine characteristics. It echoes Turkle and Papert (1990), who found that even with computers, women have "a preference for attachment and relationship" or a "relational, interactive and connected approach". This is despite the fact that technology developed in a cultural construction of science that emphasises male characteristics of "aggression, domination and competition" (ibid: p.150). Although a relatively minor discourse in the sample, the idea of interactivity being associated with gender and with larger shifts towards feminisation in cultural communication styles suggests it is part of an evolving aesthetic of communications, possibly heralding a new 'age' of interactive communication.

Back at Collins Barracks, the article author muses on the expectation of interactivity in exhibition design in modern museums and acknowledges some innovations in the area:

> "In the age of **interactivity**, the trick for every modern museum is to give people an experience of history that is not simply confined to behind glass. This is not possible with everything in [the exhibition] which has delicate and valuable artefacts including the shirt James Connolly wore when wounded at the GPO…But it already has some novel elements, including **interactive** touchscreens and mounted guns that visitors can test out."

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[111] "The decline of masculinity", Letter to the editor, *Irish Times,* October 19, 2006

The 'age of interactivity' describes a universal code or style of communication that has not only arrived but is now expected. It is associated with modernity, with the way that museums must now communicate with their publics, in a break from the past. The fetish or 'trick' is an aesthetic one – to give 'an experience' of history that goes beyond the observational or pedagogical traditionally associated with museums. This implies that merely seeing original artefacts as objects (guns, shirts etc.) is not enough to experience history. They must be touched, handled, used and visitors should also experience, even embody the characters or identities associated with them. There are practical constraints of course due to protection and conservation of the artefact's value, but 'novel' approaches can still be made using the interactivity of touchable exhibits, from tapestries to people to guns.

e) Conclusions on the Aesthetic theme

This theme represents interactivity as playing a role in challenging the relationship between artist and audience. The audience's ability to engage with an artwork is continuously managed and the tensions within this communication event are part of the artistic challenge. What appears to be an empowering effect for the audience may also be part of the experience under the deliberate control of the artist, and here what appearts to be *Empowerment* cedes to the *Aesthetic* theme. Galleries and museums may push aesthetic engagement further, seeing value in the immersive qualities of interactivity. This can be of benefit in museum display of historic or current socio-cultural and political experiences. But exhibition designers also recognise the value in the 'fetish' of interactivity, attracting visitors with the more superficial 'wow' factor of the experience interactivity is seen to promote. Whether visitors engage with the 'interactive' is another matter, and the designers' expertise is relevant in matching interactivity to the object to the context.

A variety of discourse communities contribute to the *Aesthetic* theme from those with professional engagement in the aesthetics of interactivity (or the interactivity of aesthetics) to interested bystanders. For example artists express concern about how interactivity may interfere with their communicative goals, where the audience is distracted by the fetish rather than focused on the message. Cultural theorists see interactivity as having a catastrophic effect on space or at least a distasteful association with commercialisation, while hypertext theorists see a limited role for the interactivity of the web ironically, in representing interactive text. Meanwhile audiences may either be completely immersed or unsure whether to engage, illustrating how the *Aesthetic* theme raises socio-cultural issues around the role interactivity plays. But the ICT industry understands the lure of interactivity in bringing users online, ensuring an *Aesthetic*-ally themed *Commercial* experience can be had by all.

8.2 Analysis of the Ludological theme

This theme represents interactivity as an integral aspect of games, puzzles, toys and other varieties of play. It also covers representations that suggest interactivity brings a play-like quality to other kinds of ICTs whether experimental art forms, museum exhibits, technology research, educational presentations or interpersonal communication. The analysis focuses first on gaming, then on the socio-cultural discourses around games and finally, serious games which use the ludological qualities of interactivity in other technologies.

a) Interactivity and games

The first article from 1997 reflects the rise of digital games in a review of the recently released *Blade Runner* game, signalling the pending impact of games on the film industry:

> "Westwood studios have put a great deal of effort into converting Ridley Scott's epic 1982 movie in to an **interactive** 3D game, rather than an **interactive** movie. Unlike those other games [*Sam and Max*, *Day of the Tentacle*], *Blade Runner* has a real-time story structure, creating a unique experience every time you play. This means the gameplayer determines the path of the game, not vice versa, and this is no mean feat."[112]

The reviewer draws a distinction between interactive games based on films and "interactive movies". The latter offer viewers limited choices in narrative paths, alternative endings or side-stories to follow at leisure. This alludes to the empowering aspect of interactivity, giving content co-creation options to the viewer. Interactive 3D games however follow a 'real-time story structure' featuring a first person player with an objective. Although it uses the original film for story material, backdrops and characters and has cinematic production values, the author notes the game player 'determines the path', making every game play unique. This reflects some studies on videogame play (a limited field at the time) that suggested the player 'performs' the text in videogames, controlling the narrative (e.g. Buse 1996, cited in Newman 2002) a 'narratology view' which was later contested, as noted in the literature review. *Blade Runner* is a 'point and click' adventure where the player has a third person view. It is not an infinite labyrinth but contains twelve possible endings and as in all games, potential paths and narratives are ultimately controlled in the game design. However, the complexity and richness of design and sheer size of the game – "coming on four CDs" – lends the illusion of infinite real time choice and control, which the author celebrates as "one of the best…ever". This presents the ludological aspect of interactivity – the successfully engaged player exceeds the narrative or structural limitations of the game by 'inhabiting' the gameworld, thereby fulfilling the primary objective of games, to keep playing (see Fuller and Jenkins 1995, Newman 2002, Salen and Zimmerman, 2004).

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[112] "Blade Runner", Review, *Irish Times,* December 13, 1997

Two years later, the relationship between games and film arose again, this time suggesting games may take over as the entertainment medium of choice. No longer the poor cousin, games are increasingly using cinematic techniques "to aid storytelling":

> "Nowadays most games have a credit sequence, and their design and manufacture involve as many departments as a movie studio. Meanwhile, movies are originating inside computers. But the convergence can only go so far: cinema is a passive experience an audience can share - sit back, relax and watch; gaming is non-linear and **interactive** - you are involved, making choices, deciding the outcome."[113]

The author suggests that convergence between the games and film industries cannot be complete because of a fundamental difference – film is passive while games are interactive. The representation of interactivity as empowering for the player focuses again on content and outputs rather than on experience and narrows the basis on which game play is understood. Emphasis on player choices that relate mostly to the narrative are more reflective of textual analysis, echoing the narratology approach to interactivity found in the literature and in the previous article, rather than the ludological view which took more time to develop.

Notably the author describes the 'experience' of cinema as passive, not the actual viewers or the film texts themselves. This is not the negatively passive 'viewers as powerless objects' of Adorno (1975/2003) nor is it the passivity implied in the moral panic over the effects of texts on audiences (see Barker, 2003). The experience is collective, communal and public, where the audience "sit back, relax, watch". It implies that the interactive gaming experience is more "sit forward", where "you" are physically engaged in the game, essentially a private sphere of communication.

This distinction alludes to the ongoing debate about the nature of the audience experience, in film studies particularly, as to whether viewers are passive, active, interactive or even 'smart' (see Sconce 2002, Brooker & Jermyn, 2003). The communal and benign passivity associated with cinema in this article is strongly contested in film theory, not least because detailed evidence-based audience reception studies are relatively rare (see Barker 2003). However, in another article in the sample some years later, film director Jim Sheridan suggests cinema is interactive, not in terms of narrative, but in an emotional and immersive sense:

> "I now understand visual style much more. In a way, it's more to do with what's invisible, what's not there – when you take away visual information, it gets more powerful and more **interactive** for the audience"[114].

The cognitive if not physical effort required by the audience to produce a rewarding sense of engagement represents interactivity in cinema, and is presented as a relatively recent

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[113] "Why games are going Hollywood" by Antony McKiver, *Irish Times*, November 10, 1999.
[114] "In the name of the daughters" by Michael Dwyer, *Irish Times*, October 25, 2003.

development (for him at least). The more an audience has to work to fill in the gaps, perhaps the greater the reward, but the experience is in the hands of the director, just as the aesthetic experience is in the control of the artist. This decouples interactivity from the film script through which an interactive film might offer other paths or choices of ending. It is also the inverse position of the view which represents interactivity in games as a textual or narrative support feature.

This games vs. films discourse suggests that the convergence occurring at industry and production level stops at the level of reception, because of a perceived difference in reception activity between the two media forms. However, if this perceived difference is misunderstood then the contribution of interactivity to the communication event is also misunderstood. No doubt there are fundamental differences between games and film, but the aspects of interactivity which contribute to the enjoyment of both may not be so different. The *Ludological* theme sees interactivity as the sense of engagement and cognitive involvement that immersion produces, akin to the state of absorption or 'flow' described by Czikszentmihalyi (1990, 1998) which might be part of a cinematic as much as a games experience.

b) The games industry in Ireland

By 2000, an active games industry was emerging in Ireland (see Kerr, 2002) focusing not just on games and related content for international markets but also middleware and technology 'enablers'[115]. The next article introduces one of Ireland's success stories in the gaming industry, now one of the largest middleware providers in the world[116]:

"TCD group puts PlayStation on a new level" by Madeleine Lyons, *Irish Times*, February 4, 2000:

> "A team of Dublin-based scientists are applying the laws of physics to allow PlayStation II players **interact** more physically with the games environment…over the last year they have made a significant breakthrough in applying physics simulation to the delivery of **interactive** 3D content."

The author introduces interactivity as an aspect of a player's 'physical' involvement in the games environment, not surprising as the company's software innovation is about applying the laws of physics in a virtual world:

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[115] Enablers are defined by Forfas (2002) as "core technologies that are developed to enable the production, management and distribution of digital content".
[116] See http://www.havok.com/index.php?page=company&hl=en_US

> **"For example, if Lara Croft picks up a boulder and throws it, it will fall exactly in the way it would in the real world. At the moment thousands of man hours go into programming the various ways an inanimate object will behave when it interacts with an animate object. Havok's software automatically takes care of this..."**

Physicists understand how objects behave in the real world and translate this behaviour through programming, into simulated behaviour in virtual environments. The concept of interactivity covers a multitude of effects that software can generate but which are too complex to describe in isolation[117]. The purpose of interactivity is for the aesthetic and ludological pleasure of the user – the real feel. But objects in games are not constrained by real world physics, because almost anything is possible in a virtual environment. After all, few real world women possess the physical characteristics or boulder throwing tendencies of Lara Croft, yet her potential is unlimited, such that she can break out of the game format into film and beyond. The pleasures of play are compound, found in a combination of immersion, control, performance and flow (see STEM, 2004, Kerr et al. 2007). However, the pleasures of interactivity in play appear to reside where the immersive sensation provided by the real feel meets the surprise element of the unknown and fantasy elements of virtual worlds. It is the ability of a medium to engage the player's fantasies rather than merely replicate reality that is still the essential element (see Vogel, 2007).

Yet, a significant benefit of this software is its economic impact on game development and potential for other applications. Havok's CEO notes it will cut production time by one third and reduce the bandwidth required for online gaming. And there are also real world applications "where visitors to a website can...replicate the experience of touching and feeling the item, examine its moving parts and feel its weight...it relies on the widespread availability of a force-feedback mouse." This shows how a quality of interactivity developed for virtual environments can impact on how people might interact with objects in the real world (or a simulated version at least). A 'force-feedback mouse' is a device which deliver physical feedback to a user as vibrations, rumbles, shocks and so on (like joysticks, steering wheels, trackballs, gloves in games). It uses haptic technology which is said to do for touch what computer graphics do for vision (Robles de la Torre, 2009). Haptics were first used in the arcade games of the 1970s such as Sega's *Motocross,* where force-feedback steering wheels for example accentuated the sense of vibration of a speeding car. This of course contrasts directly with the real world where industrial designers optimise steering wheels to reduce vibration as much as possible.

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[117] In "Can games become art?" by Shane Hegarty, *The Irish Times*, January 12, 2008, the author noted that when Havok recently won an Emmy award, the media were unable to explain what it was for, apart from saying they "add to the realism and **interactivity** of games" while others just baldly stated "Game geeks win award". He suggested the mystique attached to game creation and the team approach might prevent games achieving artistic status.

The interactivity of force-feedback is not there to present reality to users but adds an extra dimension to communication. Haptic touch conveys not just feeling but information about what is being felt (speed, impact, dimensions etc.) and the context around it. Interactivity combines the feeling of and information delivered by this 'received' touch adding to the immersive sensation of the play experience in games. Yet despite using more of the players' senses, some recent studies have shown that physical feedback from haptic devices is not a popular feature compared with other structural characteristics of games, ironically because it acts as a kind of 'reality check' which can prevent total absorption in the game (see Wood et al, 2004)

c) Social and cultural aspects of gaming

Two articles in the sample represent the fears expressed both in the media and the literature at the time about the impact that games might have on society, particularly on young people. Both echo similar 'moral panics' over, for example, the influence of comic books in the US in the 1950s (see Barker, 1989) and 'video nasties' in the 1980s (see Petley, 1994). It could even be seen as part of a longer arc going back to the early 1800s of the belief on the part of some that in general, "popular culture does us harm" (see Cumberbatch, 1994). The first article addresses the perceived link between a game and the murder of a boy in the UK.

"Videogame taken off shelves after boy's death" by Daniel McConnell, *Irish Times*, July 30, 2004

This article reports that videogame retailers Dixons and Game had removed the game *Manhunt* from shelves in the UK and Ireland, after a 17 year old youth pleaded guilty to the murder of a 14 year old boy in a manner which appeared to "replicate a move in the game...which gives greater rewards the more gruesome the killing". The article cites a statement from game publishers, Rockstar North:

> "Rockstar Games is a leading publisher of **interactive** entertainment geared towards mature audiences and markets its games responsibly, targeting advertising and marketing only to adult consumers aged 18 and older."

The game retailers, all UK owned chains, explained their decision to remove the game from sale as 'a mark of respect'[118]. However, a month after this article was published, the police rejected the notion of any connection between the murder and the game, stating that the

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[118] See "Manhunt game withdrawn by stores" http://news.bbc.co.uk/2/hi/uk_news/england/leicestershire/3936597.stm

motive was in fact robbery[119]. The game was rated '18' which raises questions about why a 14 year old had access to it in the first place. The UK trade body representing the games industry, the Entertainment and Leisure Software Publishers Association (ELSPA) made a formal complaint to the Home Office about media coverage, in particular "the misleading and disingenuous reporting about the effects of playing **interactive** games software". However it did little to dissuade many that violence in games was a serious concern.

d) Intertextual analysis – games classification materials and research

Game publishers at this time had begun to refer to themselves as '**interactive** entertainment' or digital entertainment companies[120]. ELSPA was eventually also renamed as the UK Interactive Entertainment (UKIE) association in 2010[121]. The name change may reflect an effort to distance the industry from the negative associations with the word 'game' created in media controversies around suggested effects and links with violence. However, it also reflects the wider activities and economic impact of the sector beyond games.

The issue of violence in games was the theme of the first conference in 2006 of the Interactive Software Federation of Europe, of which the UKIE is a member. Regulation and the different characteristics of games and film were among the issues discussed there by industry representatives, regulators and academic researchers[122], including the British Board of Film Classification (BBFC) which classifies 'videogames' as well as cinema and DVD/Video releases in the UK[123]. Its director David Cooke raised the issue of interactivity in explaining classification guidelines at the conference:

> "Our games guidelines are actually derived from our main film guidelines and the main difference that we draw attention to in the games guidelines is **interactivity**…how valid do we think that is? How much difference does **interactivity** make? And do we think there are other features in games, which ought to bring in distinguishing feature, which maybe does not operate in our practice at the moment?"[124]

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[119] See "Police reject game link to murder", *BBC News*, August 5, 2004, available at http://news.bbc.co.uk/2/hi/uk_news/england/leicestershire/3538066.stm

[120] See 'Background' description of EA at http://aboutus.ea.com/home.action or Lucas Arts 'About Us' description at http://www.lucasarts.com/company/about/page1.html. However, as noted in the 'Sceptical' theme analysis, the suffix 'interactive' was popular at the time for new divisions of traditional media companies, such as Warner Brothers Interactive Entertainment at http://www.wbie.com/

[121] See report at http://www.next-gen.biz/news/elspa-renamed-uk-interactive-entertainment-association

[122] "PC and Videogames, friends or foes? Or are the barbarians at the gates waiting to be assimilated?" ISFE Conference, July 6, 2006. See www.isfe-eu.org

[123] In September 2011 the BBFC will no longer classify video games and the UK will use the Pan-European Game Information (PEGI) system from then on. However, until this time the board operates under the Video Recordings Act 1984 which states: "Video works (including films, TV programmes and video games) which are supplied on a disc, tape or any other device capable of storing data electronically must be classified by the BBFC unless they fall within the definition of an exempted work." See also the Byron Report (2008).

[124] See ISFE conference proceedings at http://www.isfe-eu.org/index.php?PHPSESSID=7ct0veca3ovjvcfhdsjucoavn2&alias=1st-isfe-conference

The conference debated the issue at some length, but generated few answers. The BBFC classification guidelines for 2009, further address the issue as follows:

> "The BBFC acknowledges the difference between watching a film or DVD and the more **interactive** experience of playing a game but recognises that, to date, limited research has been done into whether '**interactivity'** has any significant effect on the potential for harm.
>
> In addition, the **interactivity** inherent in video games may, in certain contexts, lead to a greater potential for some content to be considered unsuitable for certain age groups. The ability of a game to make a young player complicit in behaviour involving, for example, sex, drugs or realistic violence, may be as important as the level of detail shown, especially where such behaviour forms a major component of the game, and where the level of **interactivity** is high.
>
> In a video game, the frequency with which an issue occurs is also often difficult to quantify, as it will depend on how the player chooses to play the game, and how many times a particular level is attempted before completion. Where frequency is a category defining issue (for example, with respect to strong language), the BBFC bases its judgement on an assessment of the frequency with which a player is likely to encounter the issue during normal game play."[125]

The official BBFC position is that interactivity relates to the difference in audience experience between games and film – games are 'more interactive' than 'linear' works of film and DVD. The board recognises the 'limited research' on the link between this interactive experience and the potential for harm but goes on to suggest ways in which it might be relevant to classification.

Next, interactivity is presented as 'inherent' to games, a characteristic of the medium, rather than relating just to a perception of the experience that differs from film. Further, it is a characteristic that can make a young player 'complicit' in certain kinds of behaviour, which come under the board's classification guidelines. This depicts interactivity as akin to sweets from a stranger - an aspect of games that can lure innocent players into inappropriate audience/user experiences, positioning young players as potential victims of a manipulative medium. This depiction serves to reinforce the rationale for the BBFC in classifying certain games rather than adding any clarity to the concept of interactivity. Overall, interactivity emerges as a potentially dangerous but amorphous quality used to distinguish games from film.

However, while the graphic detail of images and behaviours on screen are the issue when classifying film, it is the potential for repetition and engagement through interactivity that brings some games under the board's remit. Interactivity can enhance the effect of less graphic material. The potential for different levels of interactivity are recognised both as a characteristic of game design but also as a factor in game play – it depends on "how the player chooses to play the game, and how many times a particular level is attempted before

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[125] See BBFC Classification Guideliness 2009 available at http://www.bbfc.co.uk/classification/guidelines/

completion". This suggests that some players may be exposed to what the BBFC regard as inappropriate content, while others are not, within the same game. A high level of interactivity is a warning sign, but there is no attempt to describe how levels of interactivity might be measured, apart from frequency of occurrence of a particular 'category defining issue' during 'normal game play'. This adds even further complexity to the issue as no guidelines are given as to what constitutes 'normal' or 'abnormal' game play.

Thus the BBFC maintains wide-ranging powers in the classification of games, but appears to suggest that accurate classification could only occur on an individual basis for every player of every game. Without a clearly defined framework for understanding and measuring interactivity, it provides a somewhat weak argument for the classification of games in general. Clearly, further research into interactivity in games and the link between the interactive experience with potential for harm are required, if only to make the process of classification clearer. Relying on studies into violence on television and in film and assuming that the effects are greater in game play because of its 'inherent' interactivity is a flawed basis on which to regulate[126]. Specifically, it ignores the other major aspect of the inherent interactivity of games that more clearly differentiates them from TV or film. The game player has a greater level of control over what they experience. So although the interactivity has the potential, through engagement and repetition, to immerse a player more deeply in violence, the interactivity also carries the potential for that player to avoid, challenge, subvert and ultimately disengage from the violence. This ability to subvert the rules or game design is in fact part of the pleasure or 'meaningful play' of games (see Salen and Zimmerman 2004). However, the specific characteristics and structure of individual games and the context in and uses for which game play takes place, are aspects of the gaming experience missing from effects research.

In the UK, the Pan-European Game Information (PEGI) system has been operating alongside the BBFC since 2003. The BBFC system classification is required by hardware and console manufacturers before they licence a game, while the PEGI system provides information and detailed labelling for consumers on the content of games, essentially self regulation by the games industry itself. The dual classification system is considered by some to reflect the divisive nature on the debate over the effects of videogame play on young people[127]. A major report commissioned by the UK government on the safety for children of digital media use,

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[126] This point was made by a number of speakers at the ISFE conference such as Jeffrey Goldstein and also Guy Cumberbatch (cited in the next article for analysis) who expressed concern about the 'mechanical' quality of much research, that was somewhat dated and 'insensitive to the media' in question. He also identified differences between the US and Europe stating research from the US was predominantly in agreement on the negative effects of violence in TV, film and games, while there was some albeit minority dissent in Europe, not because of research to the contrary but because of the lack of detailed research on experience (ISFE, 2006: p.24). See also Byron report 2006.
[127] See Byron (2010). It also was depicted as a battle between the BBFC and PEGI for control, as report in "PEGI triumphs over the BBFC" at http://kotaku.com/5292677/pegi-triumphs-over-the-bbfc

also suggested that the dual classification had led to confusion and had created the impression that video game classification is not as robust as it is for film (see Byron 2008, 2010). This report, produced by UK psychologist Tanya Byron, comprehensively summarises the state of research on the effects of violence in games, referring to one of the more well known and influential studies from the US:

> "Gentile and Anderson (2003) put forward the argument that because video games are more **interactive**, the effects ought to be stronger than with passive media such as television. They believe game playing may lead to greater identification with the aggressor and greater imitation than when simply watching content. They also argue that repetition will lead to increased learning and that the **interactivity** makes the game more involving and perhaps more exciting." (Byron, 2008:150)

Byron states emphatically that there is no direct evidence to prove this and that research in general in the area is controversial and inconclusive (2008: p.146). She suggests the debate has been polarised along the lines of research communities from the 'active media' perspective (focussing on the content and characteristics of the media, more prevalent in US research) and the 'active user' perspective (emphasising context and individual player characteristics, marginally more favoured in the UK). A possible cultural divide between the US and the UK and European perspectives on research into the effects of videogame violence was also noted at the ISFE conference (ISFE, 2006: p.24).

However, the Gentile and Anderson (2003) study, while detailing the effects of characteristics of games and game play such as graphic depth, speed, realism, repetition and so on, does not actually refer to 'interactivity' or the 'interactive' in games. Byron infers this quality (as do others before and after) from the combination of characteristics outlined, again, in an effort to distinguish games from other media such as TV and film, which studies about violence in media tend to use as a basis for argument. This inference, however inadvertently made, implicates interactivity as a causal link between violence in video games and player behaviour, and also complicates its understanding by using it as an umbrella term to differentiate between media, instead of as a specific term that describes particular kinds of communication experiences and indeed their potential effects.

In Ireland, video games although technically within the remit of the Irish Film Classification Office (IFCO) are generally not regulated by them and are instead left to the PEGI system[128]. Many games released in Ireland are released first in the UK, and mostly distributed by UK owned game retailers, so UK games classifications (which follow PEGI but are enforced by the BBFC) also operate in Ireland, at least in terms of labels on packaging. Historically, there were major differences between Ireland and UK in terms of film classification, due to differing socio-cultural and political attitudes towards censorship, with Irish film censors

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[128] PEGI was set up by the ISFE in 2003.

considered particularly zealous compared to the UK (see Rockett, 2004). However, more recently British and Irish attitudes to the classification of games would be broadly similar, at least at the regulatory level. Ireland would also rely heavily on research from both the UK and the US, as few studies have been carried out at a national level. But the IFCO made an exception in 2007 and intervened to serve the first ever prohibition order on a game in Ireland, stating that the level of "gross, unrelenting and gratuitous violence is unacceptable" following an example originally set by the BBFC but subsequently overturned on appeal in the UK[129]. The game was *Manhunt 2,* the sequel to the game referred to in the article from the sample and it remains the only game ever banned in Ireland.

e) Interactivity and moral panic

The next article addresses the debate on the negative effects of violence and pornography on young people in general and refers to games as one of many media types about which society should be concerned. The analysis again focuses specifically on the implications for interactivity in this debate.

"Time to press the panic button?" by Marie Murray (psychologist) *Irish Times*, Oct 30, 2004

This article cites a wide variety of research and opinion in arguing that, "violent images are harmful to children" who need protection from an increasingly converged media. The author, a psychologist, acknowledges that the debate over the effects of media content is neither new nor resolved, but suggests that the convergence of media could lead to the increased availability of inappropriate content for children.

> "… the **interactive** nature of the child-media relationship - not just what media does but what the child does with media - has been studied extensively. We know from neuroscience that environmental experiences may shape the developing brain's connectivity, with "habits of mind" influenced by repeated exposure."

Here the author appears to present a combination of the 'active-media' and 'active-audience' perspectives. Interactivity acts as the bridge between both in general media use and consumption, with the implication that it covers a kind of feedback loop between 'what media does' and 'what the child does with the media'. This at first indicates a more nuanced understanding of what interactivity is, beyond being merely a simplistic differentiator

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[129] See "Manhunt 2 videogame prohibited" at
http://www.ifco.ie/ifco/ifcoweb.nsf/web/news?opendocument&news=yes&type=graphic. The BBFC originally rejected the game's request for classification in 2007 but after a number of appeals and a revised version of the game it was given an '18' certificate in August 2008. See "Manhunt 2 title wins ban appeal" at
http://news.bbc.co.uk/2/hi/technology/7137212.stm The game remains on the banned list in Ireland.

between games and other media. However, she then reveals the lack of evidence for a causal link in the next statement - "we know" that such media experiences "may shape" cognitive behaviour, but it is not proven.

Her reference to the 'habits of mind' that research suggests are shaped by media use, indicates that the author understands interactivity to have some cognitive impact. Being a psychologist, this is perhaps inevitable. She points to the extensive research available, although her citations are from the medical, psychological and neuroscience fields, which tend to be weighted methodologically towards analysing behaviour or effects post-media use (see Amici Curiae 2003, Newman, 2002). The effect (and frequently the aim) of such research is to change public policy towards protecting children and other 'unwitting victims', without addressing the more complex context and player characteristics that may also play a part (Amici Curiae 2003). She also quotes Winn's (1977) 'plug in drug' study to support the argument that repeated exposure to violence desensitises children. The 'television as drug' metaphor is a powerful discourse tool, particularly among the 'anti-television' lobby in the US, presenting television as part of a wider public health crisis (see Mittell, 2000). But it also represents an all too literal example of simplified hypodermic needle media effects studies. The author does not refer to media literacy, education, pre-existing contextual issues and parental responsibility as potentially contributory factors in possible media effects.

The author continues to cite a variety of further sources who "confirmed the problems caused by exposure to violence" such as the American Psychological Association, the US Surgeon General's report (1972), Taylor and Saarinen (1994) and Professor Elizabeth Newson (1994), a "respected British psychologist", as well as referring to the concerns of Irish parents reported in an Amárach Consulting report for the Internet Advisory Board (2004). This leads her to the conclusion that:

> "…the concern about **interactive** technology games such as *Doom*, *Grand Auto Theft* [sic], *Mortal Kombat* and *Manhunter* is that **interaction** requires intentional simulated violence for reward. A plethora of studies have examined the results of imitating violent roles, including increased indifference to violence and a frame of mind that sees violent acts as a socially acceptable response to frustration. Given this triad of distortion, desensitisation and addiction, allied to an increasingly subhuman portrayal of victims, we need not ask why levels of inhumanity, bullying and brutality seem so high."

The article author seamlessly connects the interactivity of games to simulated violence and the subsequent real life experiences of "inhumanity, bullying and brutality" while also suggesting that there is so much research and the connection is so obvious that debate is unnecessary. However, a closer look at some of her references raises questions of balance.

184

For example, Newson's concern, according to the author, was that children were "receiving distorted images of life before they had had life experiences". But Newson's (1994) article, a response to the brutal murder of toddler Jamie Bulger in the UK in 1994, was mostly reflective and relied on research of media coverage rather than original data. Although published in a journal of psychology, it has been criticised as "wildly misleading" by Barker (2003b) and exemplifies part of a trend of such reports, which, because of the subject matter, have their weaknesses go unnoticed. In fact Newson (1994) does not address specific characteristics of media use beyond speculation and acknowledges that videogames are beyond the scope of her research:

> "The ingenuity with which brutality is portrayed is likely to escalate over time, since the entertainment industry must try to be more and more 'entertaining' and must allow for jaded palates. (How far this might go in the future in terms of video games and virtual reality is not within the scope of this paper.)"

Nevertheless, the article author goes on to dismiss dissenting views as a general 'no harm' approach, while failing to reference the many studies which question the methodologies employed in the 'proven harm' research and the possible amplification of results (see for example Griffiths 1999, Newman 2002 & 2008, Amici Curiae 2003, Funk et al, 2004). She describes Guy Cumberbatch, as a "director of the Communications Group in Birmingham" [sic] and a "presenter from this "no harmful effects" platform", rather than as a "respected British psychologist" a term reserved for Newson[130]. In fact his critique of Newson's article was published in the same journal of psychology, just months later (Cumberbatch 1994) but is not cited in the article. Crucially, the author misrepresents his position as 'no effects' rather than 'no proven effects' of causation rather than mere correlation[131]. The question is not which of the two psychologists is more 'respected' or indeed more correct than the other. It is that the article author is using a qualitative description to lend weight to arguments upon which readers are asked to pass judgment. Lack of transparency is the issue here as readers do not have all the information on which to make a balanced judgment on a serious debate and are clearly being swayed in a particular direction. The article author may not have approved of Cumberbatch's critique:

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[130] Dr. Guy Cumberbatch is a chartered psychologist and the Director of the Communications Research Group in Birmingham and has acted as advisor to the UK government and Ofcom.
[131] See for example Cumberbatch (1987, 1988), contributions to ISFE 2006, and "Do videogames make you violent?" at http://www.timesonline.co.uk/tol/news/uk/article463189.ece in which Cumberbatch is cited in direct reference to the *Manhunt* murder case referred to in the previous article.

"Experts are very treasured by journalists. They are a cheap source of news. The problem professional bodies must address is their exploitation by pressure groups where professional expertise is eclipsed by pressure group interest."

This is a serious point and is underlined by the way the sample article has been shaped, particularly because the author is no doubt a 'respected' psychologist in Ireland. Violence in games and its potential effects on players is a serious and complex issue. However, understanding of the issue is not helped by unbalanced commentary from research professionals who fail to accurately represent the state of research. Indeed it is the absence of detailed, focused longitudinal studies of young people (and not just children) while engaged in game play, that pressurises the scientists (both 'hard' and 'soft') to answer questions which which have not been subjected to primary research (see also Kline 2003).

This article has a direct impact on the understanding of interactivity in that it represents interactivity in games as a causal link to violence. This complicates the development of a better understanding of interactivity when it is restricted to a characteristic of the medium directly responsible for specific effects, rather than a broader aspect of communication producing a range of inputs and outputs relating to both context and design. A better understanding of interactivity in games may in fact offer opportunities for audience studies structured around its features that explore the design and uses of violence in games and its potential effects on users, towards better classification and protection of vulnerable audiences. Overall, the article is representative of the debate on the possible effects of violence in games where emotion and 'moral panic' tend to cloud objective assessment of what the research is actually saying. Clearly it is a serious issue and there may be serious effects on young people, so in the absence of agreement the knee jerk reaction is to call for restrictions on availability. However, this discourse analysis has shown that classification and regulatory bodies are themselves unsure how to approach games and are confused and possibly overcautious about the role of interactivity. With regulation now passing to the 'interactive entertainment' industry themselves, it is not clear what greater understanding they will bring to the issue. Properly structured longitudinal studies which analyse media uses in their natural contexts along with individual player characteristics as well as game design and structures would certainly help to clarify where effects might be found, how they might be measured and what role interactivity actually might play.

f) Serious Games

Another sign of the maturing of games as a medium later in the sample is the renewed focus on the positive aspects of gaming and the benefits that games can bring to other fields. An

article from 2006 reports on a pilot scheme aimed at tackling childhood obesity and low levels of engagement in sport:

> "40 local children were invited…to take part in a trial with two **interactive** games…as part of an effort to get inactive children involved in movement through functional games in a friendly, non-competitive environment. Besides improving their movement skills and functional cardiovascular efficiency, users report that the use of **interactive**, virtual reality products…significantly improve both the participation and retention rates of young people who don't normally participate in traditional exercise and sports programmes…"[132]

While the results are impressive, it is unclear what role the interactivity plays in improving participation rates. School pupils reported that the games were "really cool" and "preferable to doing a PE class". The games use a combination of screen, camera and infrared tracking device (similar to Nintendo Wii components) so that users' movements can be guided and measured and can also affect the on-screen environment[133]. The question is whether the interactive features of the specific game itself attracted and retained the participants, or the fact that the overall feel replicated interactive gaming experiences with which they were already comfortable. Either way, it describes a positive effect of interactive games on younger people. Towards the end of the sample the broader implications of the success of 'serious games' for businesses are addressed:

> "The next big web 2.0 phenomenon is tipped to be serious games, online education tools that use games technology and role-play worlds for an **interactive** learning experience that is already attracting the interest of businesses and the public sector."[134]

The kind of interactivity described here may be pedagogical in context but is ludological in design and commercial in terms of benefits. One of the games is designed to teach workplace safety, but has a "similar look and feel to Sims" one of the biggest selling games in history, with particular popularity among female players (see Nakamura and Wirman 2005, Cassell and Jenkins 1999). Putting 'serious' games in the workplace changes the context and motivation for playing. Yet context and motivation are the basis of many studies on game play that try to identify what makes them immersive and popular. Indeed studies into Sims have shown that it is the potential for 'comfortable isolation' rather than social interaction that appeals in particular to women (Jansz, Avis and Vosmeer, 2010).

What is different about workplace games is that the outcome and reward is important not just to the player but possibly even more so to the employer. One games developer is quoted as saying that, "more organisations have overcome prejudices about letting games anywhere

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[132] "Childhood obesity epidemic 'on par with US'" by Michelle McDonagh, *Irish Times*, April 19, 2006.
[133] See Cybex Trazer (the product cited in the article) details at http://www.exergamefitness.com/about_us.htm
[134] "Serious games make learning fun" by Ian Campbell, *Irish Times*, April 3, 2009.

near the workplace". This has only happened because real world results show a positive correlation between using interactive games and learning in the workplace. Finally, the fact that the article was published in the *Business* genre is indicative that interactivity in games has come of age and like Lara Croft, has escaped into other domains.

g) Conclusions on the Ludological theme

The *Ludological* theme illustrates how the issues observed in the literature are reflected in the coverage, such as the 'narratology vs. ludology' question, how the interactivity of games compares to the perceived 'passive' nature of film and television and the impact of games and film on each other. It also illustrates how the role of a discourse community may impact on the views expressed on interactivity. Early articles take a narratology view, suggesting that because users control the narrative in games, the experience is more interactive than film. Meanwhile the film community explores the idea that a lack of information provokes cognitive interactivity for the audience. Crucially, both suggest that the experience of interactivity in both games and film concerns a level of immersion and flow. This associates interactivity with an 'active' audience, regardless of the medium in use.

The games industry relates interactivity to the level of activity or 'real feel' that the audience can experience. Interactivity adds to user experience but it benefits the industry too, creating a new middleware link in the production chain and cutting lead times in game development. But designing the 'real feel' of interactivity requires a delicate balance, so that excessively realistic controls do not allow reality to intrude on the immersive experience. A *Commercial* theme is introduced where an appropriate experience of interactivity benefits the entire industry chain.

This analysis also addresses more serious issues associated with interactivity which arise out of play. A lack of research into game play and the assumption that the 'inherent' interactivity of games creates stronger effects on players, implicates interactivity in the link between violence in games and behaviour. An intertextual analysis shows that the discourse community of psychologists is split in the debate over violence in games, and the lack of understanding of interactivity in games is acknowledged in both classification and policy documents. But the coverage represents only one side of this debate, introducing a 'moral panic' over interactivity in games, despite the lack of evidence of a causal link.

On the other hand, positive behavioural outcomes are observed in the 'serious' games used in educational contexts. Medical professionals use the *Ludological* theme of interactivity to describe their pedagogical and health benefits, but it is again unclear whether or how interactivity produces these outcomes, other than having appeal in their game-like design. Some of the elements of game play outlined in the literature such as user control over narrative, immersion, flow and detachment from reality are associated with interactivity under

this theme. But the elements which describe the specific strategic choices a user makes based on the design and structure built into the game (after Salen & Zimmerman 2004), are not addressed. Indeed players are not represented (except where journalists speak on their behalf) and emerge from the coverage as relatively passive users. They are considered to be directly affected, positively and negatively, by exposure to games and interactivity in particular. Rather than exploring the particular role of interactivity in games, the *Ludological* theme merely emphasises how it differentiates games from other media and/or is associated with game-like experiences. This leaves interactivity open to exclusion from or manipulation in media effects analysis.

8.3 Analysis of the Futuropia theme

This analysis follows a thread of articles most representative of the *Futuropia* theme. It shows how some visions lasted to form a significant influence over discourses on interactivity and new media in general while others quickly became outdated. The first article from early in the sample represents a regular year-end round up of the main ICT stories and developments of the previous year, along with attempts to predict the trends to come:

a) Y2K, convergence and chat

"The year of the chat" by Michael Cunningham, *Irish Times,* December 29, 1997

Although this article dates from 1997, the big issue on the radar was the year 2000 problem. According to this author it was "bound to be a major political headache, insurance nightmare and budgetary disaster". This accurately describes the fallout of "Y2K" fever which rather than focusing on specific threats to computers, data, information systems or financial markets, became a socially amplified risk (see McGregor, 2003). There is no specific association made between interactivity and Y2K here, but the issue helps to provide context for the kind of predictions circulating at the time.

As well as the Y2K problem, the author identifies a number of other trends likely in 1998 including "Consolidation", "Convergence", "Interactivity" and "Chat". The consolidation of ICT related industries was already underway with software giants buying up internet companies and search engines competing to dominate their market and attract buyers, although the big mergers such as AOL/Time Warner were some years away yet. Convergence here refers to the merging of devices and platforms "towards one single piece of hardware", with the author predicting that 1998 would be the first year where more PCs would be sold than TVs. This indeed turned out to be the case, helped also by the release of Microsoft's Windows98 software, the first operating system designed specifically for the

home user market[135]. Convergence is of course a recurring motif throughout the sample, representing broad changes in the structure of media and ICT industries as well as individual product uses. As noted under the commercial theme analysis, Nicholas Negroponte's vision of convergence was influential because of his frequent presentations to industry, describing the coming together of the broadcasting, publishing and computer industries. Convergence would be seen in the merging of "the sensory richness of video, the information depth of publishing and the intrinsic **interactivity** of computers" (Negroponte, 1995)[136]. Meanwhile, the influence of Bill Gates on the concept of convergence in the sample is seen perhaps more through actions than words, with Microsoft announcing a series of joint ventures, take-overs, link ups and investments with other industries throughout the fifteen years of the sample. One of the earliest in 1995 was the announcement that Microsoft and NBC were to link up to form a new concept – a 24-hour cable and online news service:

> "One of the key things is that both of the companies are saying we believe in the world of **interactivity** but we're bringing this world into broadcast " Mr Gates said in Hong Kong. "We'll be working with NBC to create innovative **interactive** news content and an integrated media experience."…Mr Jack Welch, chairman of NBC's parent, General Electric Co., said, "This is a big deal for GE because commerce is never going to be the same in the next decade."[137]

The story is typical of its time in terms of reporting style and emphasis. It opens with the identification of the main player, in uppercase as "SOFTWARE billionaire Mr Bill Gates…" stating wealth before name, including his title ('Mr'), a hallmark of more formal US journalism address[138]. It describes a deal that "marries" the broadcast network with the "world's biggest software company". The marriage metaphor was common for mergers and acquisitions at the time, suggesting the alliance of well matched equals but equally as often implying short term 'shot gun' arrangements as likely to end in divorce.

Gates signals that the two companies are at one in terms of 'belief' in "the world of interactivity", again reflecting a suggestion running through the analysis that interactivity may be as much about a quasi-religious faith in the idea than any specific understanding of it. However Gates asserts control over that world, perhaps like Negroponte, seeing interactivity as intrinsic to computers and convergence merely allowing it to migrate to other media. This corresponds with his view that interactivity first appeared with the graphic user interface, then with CD-Roms, finally moving to the web, where Microsoft was "focused intently" for the

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[135] See http://www.microsoft.com/presspass/press/1998/jun98/availpr.mspx
[136] See "The MIT MediaLab is the holy grail for multimedia" by Anne Byrne, *Irish Times,* May 16, 2000 and also Negroponte (1995: p.225) from which the article cites.
[137] As reported in "Microsoft, NBC to link up" by Reuters, *Irish Times*, December 12, 1995.
[138] The article byline is Reuters news agency.

future (see Gates 1996: p58, pp220-21, p321)[139]. Yet here, he describes "news content" as interactive, suggesting that it is the data itself that people interact with rather than the medium. The new integrated experience would allow the same data to be accessed on different platforms, again linking interactivity with the cross platform nature of convergence. In 1997, Microsoft and NBC took a step further in their joint news operation and opened what was reported in another article, as "a futuristic, 115,000 square foot studio equipped with a remarkable array of technology", a statement of intent as much as a production facility:

> "The new fully digital "cyberstudio" emphasises how seriously these two major players are taking the prospect of **interactive** news...[Microsoft] said: "This facility is the next stop in the implementation of our shared vision of how to change the way news is delivered. Some time in the future personal computers and television will merge. We have put a stake in the ground. That is a medium we want to own.""

There is no doubt about Microsoft's place in this vision. The devices may converge but the ICT and media delivery industry will still control the uses and content – news would be "interactive" at the production as well as the distribution and consumption end. The timing of the announcement was crucial, coming just hours before US broadcasting authorities granted new digital TV licences to broadcasters. The expense and fit out of the studio was designed to leave no doubt in competitors' minds as to who would own the future of "interactive" news. However, in 2005, NBC bought out Microsoft's stake in the cable channel, the divergence separating broadcast and online into two separate entities again, and reflecting the increasing difference in editorial approach between online and TV news[140]. Although the vision for interactive news had been realised in terms of data, the computer and television had not merged. But more crucially, and as they admitted themselves, Microsoft's efforts to change from software provision to "content" had largely fallen flat[141].

In 1997, without any such converged platform example existing in Ireland, interactivity was still seen very much exclusively as a feature of the web. Back at the year-end overview, the article author addresses the third big trend for 1998:

> "**Interactivity:** While many Irish organisations have flocked to the Web, often the sites are just glorified brochures. They keep missing the online paradigm - that networking isn't just a linear, top-down, one-way flow of information but offers new ways to interact. Often the sites don't even have a decent feedback form, let alone a discussion zone or email directory."

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[139] Gates (1996) also acknowledges the wrong turns taken and the resources that were wasted during the interactive television "gold rush" as noted under the money and marketing analysis – "...suddenly interactive TV was passe, and interactive networked computing was hot", a development which happily coincided with Microsoft's vision and business strategy (ibid: p.260).
[140] The two entities went on to develop very different news styles, as reported in "msnbc.com may change its name" by Brian Stelter, *New York Times* October 6, 2010 at http://www.nytimes.com/2010/10/07/business/media/07msnbc.html
[141] "Ballmer: Would not launch MSNBC again" by Stefanie Olsen, *C-Net,* June 11, 2001.

Interactivity is a feature of the "online paradigm" with indications that it represents a new and different way of doing things. The web offers "new ways to interact" but Irish businesses fail to grasp this and still use the "linear, top-down, one-way flow of information" style of communication. The implication is that interactive communication online is different – a non-linear, horizontal, two-way flow of information. Interactivity is a characteristic of the medium but also emerges in the application of skill in designing a new kind of communication that can take place in the traditional domain of business. However, although the ingredients are there for interactivity, Irish organisations are either unaware, unsure how to proceed or perhaps uncomfortable with this new paradigm.

b) From atoms to systems – ubiquitous interactivity

Technological forecasting has been a well-established branch of general business forecasting for decades and is one of the key services offered by business consulting firms. Indeed some firms like IBM now derive as much of their business from technology forecasting and consultancy as from selling ICT products and services (Kipping, 2002). Bloomfield and Vurdubakis (2002) identify a strategic discourse among 'consultized' IT companies in the way that they align technology with the future. These firms represent technology as substituting "future knowledge for present ignorance" (ibid, p.123), but they are also selling software in the process of addressing this deficit. The next article reports on the PricewaterhouseCoopers annual technology forecast for 2000:

 "Prediction on IT developments spice up an annual report on all things tech" by Madeleine Lyons, *Irish Times,* May 26, 2000

The annual PwC technology forecast report generated significant interest among media, academia and businesses at this time and served to shape discourses around future developments of technology in the months and sometimes years following publication. The article outlines some of the key elements of the PwC vision, which for the first time attempted to predict up to three years into the future. The author describes it as "meaty reading", with its main thrust in the identification of a shift to ubiquitous computing "through a range of fixed and mobile devices":

> "…the computing architecture for the 21st century will largely be based on pervasive
> or ubiquitous computing and the increased use of virtual reality. This conclusion is
> based on a common belief that computers no longer function as "discrete identifiable
> devices" with which humans **interact** through keyboards and displays. Instead –
> through pervasive computing – computers will disappear from the desktop and

become embedded in the environment around us. And through virtual reality the user will be absorbed into an artificial world created by the computer, becoming its own environment."

Over a decade later, it is hard to fault this prediction. As noted in the literature review, ubiquitous computing as the third phase of computing architecture is now a standard computer science field. The PwC report presents a view of interactivity as governing the interface between user and machine, which in 2000 was still dominated by desktop and laptop computers where users interacted "through keyboards and displays". Ubiquitous computing would remove these 'discrete devices' and embed them invisibly all around. Virtual reality would then step in to create an environment for users to interact *within*, rather than an interface to interact *at,* adding an immersive quality to the interactive experience. This reflects Weiser's (1991) original vision of a computing paradigm, which, unlike computer use then, would improve interpersonal and social interaction:

> "Ubiquitous computers…reside in the human world and pose no barrier to personal interactions. If anything, the transparent connections that they offer between different locations and times may tend to bring communities closer together." (1991:p.104)

However, while PwC see the hardware capability emerging soon, the challenge lies in developing the software, or rather choosing which software applications to pay for and develop. The report editor is quoted saying "that is why the timing and availability of all these futuristic applications is so tricky. It depends on which ones emerge as the most useful to the consumer". The visionary aspect of ubiquitous computing places technology comfortably in society, part of a new philosophical approach to how humans and computers interact. However, the ICT industry bows to the market to drive the specifics of the vision that will be offered to users. The article author goes on to describe the domestic part of the consumer vision:

> "The home of the future is expected to feature e-mail access terminals, non-windows based information appliances and electronic tablets based on mobile flat panel displays. Next generation television set-top boxes will combine internet access with **interactive** television features."

Again, the predictions were quite accurate although at the time the idea of 'non-windows based appliances' seemed unthinkable in a domestic personal computer market still dominated by Microsoft operating systems. But the part of the vision that encountered most problems in execution was interactive television, which has been explored under the *Commercial* theme. It is worth noting again how the television apparatus was central to so many visions of the technological future at this time (including the *Information Society*

outlook as noted further). This was despite the fact that infrastructural and regulatory problems were already interfering with its potential. The media delivery industry had not driven its technological potential with enthusiasm partly because, as the PwC editor correctly observed, the consumer had not so far considered it to be particularly useful.

Visions of such new domestic arrangements in the future are common across the *Futuropia* theme and the article goes on to describe "smart fridges" and game consoles that provide all a household's ICT needs. The combination of wireless application protocol (WAP), Bluetooth, standardised platforms and so on described were in place within a year or two of the report. But according to the PWC editor, a crucial part of the vision, to which interactivity is central, is still missing because "the payment model for these services and potential revenue sources still remain unclear."

Ubiquitous computing may pose no barriers to personal interactions and can deliver interactivity without rigid interfaces, but it appears to pose problems for financial interactions and transactions. A fluid data exchange environment is difficult to monetise, so, as in the case of interactive television, the full potential of interactivity in the utopian ubiquitous computing view of the future cannot yet be realised.

c) The future in/on film

Many references to film pepper the sample with more visually descriptive fictional visions of the future. Apocalyptic, prophetic and fantasy worlds are conjured up by writers, directors and cinematographers that represent interactivity under the *Futuropia* theme but also the *Empowerment* and *Commercial* themes. As noted earlier under the analysis of both these themes, films such as *Blade Runner* (1982) and *Minority Report* (2002)*,* present visions of interactivity that emphasise its empowering but divisive capabilities or its immersive surveillance features. Both also present a dystopian view of the future, which is the more commonly found perspective in films referenced in the sample. They present images of a future where the ubiquitous computing vision is realised perhaps in architecture and structure, but not so much in terms of the philosophy of "bringing communities closer together". Interactivity arises in the relationship between technology and society and the impact both may have upon each other, a theme also raised in some of the other films referenced in the sample.

A review of *Timecop* (1995) describes a ubiquitous computing world, where in the future (the film deals with several time periods) technology is embedded in the public environment. The author notes that "futuristic designs are convincing in their restraint, with everyone traveling and living in sleek monochrome capsules, complete with **interactive** videos"[142]. The idea of interactive video on the commute and at home was a convincing image of the future for the

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[142] "Alive and kicking" by Helen Meany, *Irish Times,* January 6, 1995.

reviewer. This suggests it was not a stretch from the technologies of the present and if the technology is believable, then the contexts and uses appear logical, a useful tool where different time periods are colliding.

Meanwhile, *Starship Troopers (*1998) has a more humorous take on the typical dystopian view of the future – "the action [is] punctuated by information bursts from Fednet, an **interactive** government propaganda medium that ends every blood soaked report with a chirpy 'want to know more?'…"[143] The author explains that the film follows themes first raised in director Paul Verhoeven's previous film, *Robocop* (1987) – it "pokes fun at the notion that technology gives you a real choice". The representation of interactivity of the 'propaganda medium' of the future is a low level empowerment, all but one-way communication. The options for information are highly controlled by the sender and pushed at the viewer. Originally, this article was coded with the *Information Society* theme (before the *Futuropia* theme was developed), because in a way, it describes an e-government style configuration. However, it doesn't fulfil the other criteria of the IS theme, such as policy references and terminology, and so was recoded as *Futuropia*, although it could possibly represent the more extreme dystopian view of the IS.

All four films are designed through visuals and narrative to generate some anxiety around the future, not least in relation to what technology can or should do. The role of interactivity in these fictional predictions is tied up with the dystopian view and associated with totalitarian control, propaganda and surveillance. The *Empowerment* theme is present but on the side of the 'state' or controlling entities. However, these representations of interactivity emerge from the journalists' or reviewers' subjective assessment and description of the film content, rather than from the actual films themselves. This after all is a discourse and not a film analysis, so there is a double reflection required on the meanings being presented. The representation of interactivity in film emerges as much from the article authors finding it an appropriate term to describe the futuristic ICTs depicted, as much as from the film content itself. This accentuates the associations of interactivity with futuristic visions, because it appears that to describe something as interactive in public discourse, is to imply it is futuristic, allowing for all kinds of fictional ICTs. Article authors expect readers to be comfortable with the association so interactivity needs little further explanation in the film examples given. Much like the *Hula-hoop* theme which presents interactivity as "y'know, for kids", the *Futuropia* theme says interactivity is "y'know, the future…"

d) Interactivity 2.0

The final article in this analysis addresses the last of the paradigm defining monikers to appear in the sample, developed to describe the second generation of web applications and

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[143] "Dutch provocateur" by Hugh Linehan, *Irish Times,* January 3, 1998.

services that emerged post the 2001 dot com boom – "Is the web 2.0 bubble next in line to burst?" by John Collins, Innovation, *The Irish Times*, September 10, 2007

This article opens with a comment on the merger of two web service giants, which the author sees as a turning point for the industry, but also a sign of a return to the hype of the dot com boom:

> "Google's purchase of video sharing YouTube last October for $1.65 billion (€1.2 billion) was a landmark event for the industry in more ways than one. Many saw it as evidence that Web 2.0, the trend for websites to offer more **interactivity** and community features that can easily be controlled by users, had come of age."

The author presents interactivity, or rather the increased amount of interactivity that websites now offered compared to previously, as a defining feature of "Web 2.0". This suggests that interactivity is an application of design, presented on websites in the form of increased functionality, a view common amongst the web design community. Interactivity is instrumental in enabling content to be shared and uploaded by users, through "community features", as YouTube has amply illustrated since its launch. This depicts an empowerment view of interactivity, both in terms of the websites offering more to users, and the qualities that it brings to the user experience. Community features and control by users also reflects the empowerment perspective, but it is the connection to "Web 2.0" and its "coming of age", implying that it is the paradigm to define future web experiences, that places this representation of interactivity in the realm of *Futuropia*.

The term "Web 2.0" is a neologism that uses a numbered version format common in ICT discourses to denote a technical specification or upgrade (i.e. a development from version 1.0). However, this neologism is a play on the format and does not signify any specific technological departure or upgrade from previous 'versions' of the web. It is a catchall term to describe the emergence of a group of web-based services and applications that were harnessing mostly existing technologies to address user demand for increased sharing and publishing of data on the web in the early years of the 2000s. The technology publishers O'Reilly Media claim to have coined the term for a conference in 2004 (see O'Reilly 2005, Everitt and Mills 2009)[144]. Some web researchers and commentators however contest this and dismiss its descriptive power as no more than 'jargon'[145].

The use of a version number implies a forward moving or continuously evolving process, which sits well with ICT marketing initiatives. However, it simultaneously assumes both a

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[144] O'Reilly media sought to protect the 'web 2.0' title in 2006 by sending a 'cease and desist' letter to an Irish IT organisation planning to hold their own 'web 2.0' conference. The move was considered by some to go against the philosophy that the term described and the controversy was reported widely. See "Squabble over name ruffles web utopia" by Sara Ivry, *New York Times,* May 29, 2006 at http://www.nytimes.com/2006/05/29/technology/29web.html
[145] For example, Tim Berners-Lee (the founder of the world wide web) prefers the term 'semantic web' as outlined in interview with IBM developer works at http://www.ibm.com/developerworks/podcast/dwi/cm-int082206txt.html . See also Everitt and Mills (2009).

previous lesser version 1.0 and potential for a further improved version 3.0. This presents web technologies and communications in a simplistic linear development form rather than in the more complex and organic developmental format, with many dead ends, that they (and many technologies) actually undergo (see Bijker, 1995 for example). Thus, a label like this may operate more as a kind of response to anxiety in the face of the new, a way of controlling rampant development and gathering innovations under a single umbrella which can be observed, measured and monetised. However "Web 2.0" (and indeed any other 2.0) is a model with 'descriptive and performative powers', signalling a possible change in 'informational *culture*' (Bassett, 2008). But the actual complexity behind cultural shifts, as experienced through ICT development and use, is obscured by "new media evangelism or dystopian foreboding" associated with a term like "web 2.0" (see Everitt and Mills, 2009). This evangelism and foreboding accurately reflects the polarised extremes of *Futuropia* expressed in this sample, with most discourse communities unable to envisage a middle ground in between or a neutral position for interactivity.

Throughout the rest of the 2007 article, various contributors give conflicting views on how long this new vision of the web will last. A UK technology journalist states that there will be another bust and that "Web 2.0" is "déjà vu all over again". Next, a writer who had recently published a critique of the "web 2.0 revolution" predicts no such burst, as there are not the levels of public money invested in "web 2.0" as there were in the first internet wave when it crashed[146]. The next contributor, a technology consultant, is "widely seen as an authority on current web trends", who also predicts that there will not be a serious crash in the future because the levels of investment in Web 2.0 are lower. Although it is not explored, this lowering of costs seems to be connected to interactivity being considered a key feature of "web 2.0". Interactivity enables users to produce, publish and share content, rather than web companies suggesting that if they build it, users will come and populate its content and it will not cost so much.

Finally, the author quotes an IBM consultant who is "enthusiastic" about Web 2.0. He dismisses "the hype surrounding Web 2.0 saying it is the nature of the tech industry to hype the latest new thing". Of course IBM, like PwC, McKinsey and other management consultants who appear throughout the sample, are an influential discourse community on ICT issues, and are responsible for a share of this 'hype'. If "web 2.0" turns out to be hype, then interactivity may be tainted by association. As for its general prospects in *Futuropia*, however, interactivity sits between the utopian and dystopian extremes, although as the article author concludes, using the only suitable if clichéd phrase, "only time will tell".

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[146] Andrew Keen (2007) argues that Web 2.0 is damaging to culture and questions the 'wisdom of the crowd'. See also "Cult of the Amateur", *New York Times*, June 2, 2007 at http://www.nytimes.com/2007/06/29/books/29book.html

e) Conclusions on the Futuropia theme

Looking back over the analysis, time has indeed told a story about the representation of interactivity as part of some future vision. The coverage swings between utopian and dystopian views, with interactivity depicted as instrumental in both and rarely as balanced in between. The *Commercial* theme arises frequently alongside *Futuropia* as industry interests seek to control the predicted new media paradigms and their interactivity.

Early in the sample, interactivity is associated with the convergence that was bringing disparate types of industry together. Their shared "belief" in the "world of interactivity" reflects the spiritual terminology that arises in some discourses about the future. Either the belief was misplaced, or their vision of the world may have been different, because the convergence did not last. Confusion over whether interactivity relates to the data (e.g. news) or the converged medium that carries it, and the failure of the latter to emerge, meant that industries diverged again. The future of broadcast news in the US was to be far more politically divergent than the cross platform convergent model in which Microsoft believed, in their world of interactivity.

Meanwhile by 2000, the computer science field was following a utopian vision of ubiquitous computing which would see the removal of the interface and the embedding of technology into society. Interactivity described a new philosophy of HCI in which users would interact *within* a ubiquitous computing environment rather than *at* an interface. While finding such utopian discourses useful, at least in the prediction sector of management consulting, the ICT industry was unsure how to monetise this potential technology. However, interactivity is at the mercy of technological forecasting which is as much about testing acceptance as describing potential. Descriptions of 'the home of the future' still have interactive TV at the centre, despite the fact that this configuration was proving expensive to develop and had already failed to catch users' imaginations.

Dystopian views also emerge from the ubiquitous paradigm, where concerns over volume and quality of data arise. Cinematic visions represent a ubiquitous computing future with interactivity used for sinister purposes. These visions serve a similar purpose to ICT forecasting, however, in that they test ideas around ICTs and society and their acceptance among users. Indeed interactivity emerges as a shorthand description for 'futuristic visions of ICTs in society', as portrayed in film.

Finally, attempts to associate interactivity with branded 'versions' of the future, place it on an evolving linear path towards further utopian and dystopian worlds. Again the *Commercial* theme arises where industry interests attempt to control the next version of interactivity describing it as the defining feature of "web 2.0". This does interactivity few favours, returning it to the realm of hype. However, according to the consultants, hype relates to the present, confirming that interactivity exists now, rather than being a fantasy of *Futuropia*.

Hype is also represented in the discourses of industry personalities or luminaries such as Bill Gates, Nicholas Negroponte and Tim O'Reilly. As with the *Commercial* theme, these prominent figures could be viewed as a discourse community with particular shared interest in 'owning' the media characteristics of the future.

CHAPTER 9

Discourse Analysis part III:

Hula-hoop, Sceptical and *Information Society* **themes**

The second part of the discourse analysis addresses the final themes in the sample. Each is again briefly introduced followed by analysis and discussion in relation to relevant articles and threads selected from the coverage.

9.1 Analysis of the Hula-hoop theme

This theme differs from others in that it reflects a lack of discourse rather than the presence of detailed representations. It is identified where articles implicitly or explicitly represent interactivity as whimsical and associated it with children, with little detailed information. However, articles coded with this theme can be divided into three general types.

a) Adjectival use

Here, 'interactive' as used an adjective for a communication event specifically aimed at children e.g. "…there are painting workshops and **interactive** performances for children"[147]. This reference displays very little information about the word 'interactive'. Readers are left to assume from the rest of the context or their own knowledge what quality interactivity brings to the performance. Another of these examples states that "…the website, [includes] photographs, sound recordings, video clips and **interactive** games for children."[148] Here, readers may not have to do so much work to understand, as the configuration is a website and the interactivity describes games content. This carries a minor ludological theme, only in that interactivity is associated with games, but it is unclear whether these games are designated for children because they are interactive, or they are interactive because they are online. Again, it is difficult to discern what quality the interactivity brings to the communication event, but the assumption again is that there is no need to explain further because, it is just "for kids".

b) Particular appeal

This use suggests that 'interactive' communication events may have particular appeal for children, or particular kinds of children: e.g. "…a four-hour **interactive** show for kids with learning disabilities." This use of interactivity has the same adjectival purpose as the first example but by describing the audience as children 'with learning difficulties' the suggestion is that their difficulties will not be a barrier to enjoying or participating in the show. The interactivity perhaps adds a quality of inclusiveness or ease of immersion. There may even be

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[147] As reported in "Check Up", by Lorna Kernan, *Irish Times,* November 7, 1997.
[148] "Tracking the birds of summer" by Niall Hatch, *Irish Times*, April 23, 2007.

a minor pedagogical theme operating here also in how the interactivity aids such children in a cognitive sense, but there is too little information to go on as to how this might be understood. Another example presents interactivity as something designed precisely to attract children:

> "There are even child-enticing exhibits, such as an **interactive** screen game in which buildings are flashed before you and you have to name the style from options that include Gothic, Gothic revival, Classical, neo-Classical, Modern and Post-modern."[149]

This example has a slightly stronger ludological or pedagogical theme (or a combined 'serious games' theme), but it is the phrase 'child-enticing' that most strongly reflects on interactivity as a design feature with alluring properties for children. The implication is that the exhibition designers specifically addressed children as an audience through interactive communications. Although they are not cited or quoted in the article, the designers have a strong discursive force, at least as represented by the article author.

c) Keeping them busy

Some articles relate interactivity to activities for children to do at weekends, on holidays or while travelling in other countries. Such articles frequently also encompass the two former types: e.g. "[Berlin's] Labyrinth Children's Museum has **interactive** exhibitions especially suited for pre-schoolers"[150]. This reflects the adjectival use of interactivity again, with a specific focus on a younger age group, the only difference being that the context is in an article suggesting things to do on a weekend in Berlin. This presents an international perspective, suggesting that interactivity is a feature of exhibits designed specifically for children, not just in Ireland but in Europe also. That it is particularly suited to 'pre-schoolers' implies that it has a minor pedagogical quality that accommodates the specifics of communicating to an audience of that age but again, no further detail is given. The last example similarly describes exhibits, this time in Cardiff:

> "If you've brought the kids along, a great place to visit is Techniquest, in Cardiff Bay. This science discovery centre features an array of **interactive** exhibits and live demonstrations."[151]

There is a stronger *Pedagogical* theme operating alongside the *Hula-hoop* theme here, as the content is specifically science orientated and the communication also involves live demonstrations. However, the perspective on interactivity still relates to the 'kids' who will appreciate the content of the communications described as interactive, if only for something to do while visiting with their parents.

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[149] "Architecture puts on a show for the public" by Emma Cullinan, *Irish Times*, March 10, 2005
[150] "At the very heart of a city that has resurrected itself" *Irish Times*, May 29th, 2004
[151] "Rugby Union" by Jo Manning, *Irish Times*, May 13, 2006

d) Conclusions on the Hula-hoop theme

Journalists are the most common discourse community in the *Hula-hoop* theme analysis. Indeed the way interactivity is represented suggests that it operates as journalistic shorthand for communications that appeal to children, serving as a beacon for readers on the lookout for information on child friendly communication events. This suits the genre of publication for these articles which is mostly entertainment, travel and lifestyle features, However, without further detail or other discourse communities to assess (particularly children), this representation cannot be elaborated on further. This is unfortunate as the 'hula-hoop' theme offers tantalising glimpses of a quality that interactivity appears to add to communication, that children may inherently understand while adults remain rooted in an older mode.

This analysis also shows that the theme frequently competes with other themes, particularly the *Pedagogical* and *Ludological* themes. These emerge for example where details given on the context make reference to 'museum; 'learning' or 'game', but where interactivity is predominantly something to be enjoyed by children. But as noted under the *Ludological* analysis, games are not always for play. These competing themes may again emerge through adult attempts to explain the attraction to children by reference to established modes of communication rather than recognising a different and new appreciation of communication events.

A better analogy for *Hula-hoop* interactivity may be the hula hoop itself which is not a game but a toy. Cross' (1997) observes that while toys of the early 1900s were designed to replicate reality and "adult occupations", modern toys "invite children into a fantasy world free of adults" (cited in Vogel 2007: p.356). Therefore something that is designed "for kids" should not need any explanation for or perhaps *cannot* be explained to adults. *Hula-hoop* interactivity represents a style of communication that is attractive to children, *precisely because* it is not for adults. It represents interactivity as an invitation to act or a route to fantasy that appeals to the child's imagination.

The discourse community of designers is included indirectly in citations or quotes by journalists although there is no detail on how or why designed interactivity works for children. Indeed, some of the more successful interactive exhibits in science and other museums that particularly appeal to children, have been described as being successful more 'by luck' than by design (see Reading 2006). Where communications that are supposed to appeal to children fail for some reason, the representation can still reflect a *Hula-hoop* theme, but also more strongly the *Sceptical* theme. An article on a Disney "interactive" animation tour, analysed next under the *Sceptical* theme, illustrates how forcing a *Hula-hoop* representation of interactivity may not work when there is too much detail that contradicts this depiction. All the other examples presented give minimal information on the communication event being described – a sentence or paragraph at most. However, the

Disney article contained 1500 words clearly focused on finding where interactivity resided in an event repeatedly described by the designers as such and targeted specifically at children. The result was a sceptical rather than 'toy' like view of interactivity presented by the author, despite the designers 'Hula-hoop' aspirations. But in the event, the children in the audience did not lose out, having adapted their behaviour to get results from the communication event, despite it not presenting them with the ultimate in *Hula-hoop* - a fantasy world free of adults. Ultimately *Hula-hoop* interactivity survives through lack of discourse because when detail is added and discourse develops, other themes take over.

9.2 Analysis of the sceptical theme

The sceptical theme emerges in articles that question the nature of interactivity, seeking to expose the hype or myths surrounding it. This analysis focuses on articles specifically about interactivity written by sceptical authors, as well as articles on related topics that cite sceptical views.

a) Disney interactive - hyping-up and dumbing-down

The first article for analysis from the first year in the sample focuses on how interactivity is associated with 'dumbing down' of communication. It is a review of the "Pocahontas Interactive Animation Tour" which is to visit Ireland in 1995

"Disney's Indian Gift" by Penelope Dening, *Irish Times,* August 26, 1995

The first paragraph notes the high level of expectation promised by the tour and, using scare quotes, sets a sceptical tone for the rest of the article**.** The author is unconvinced that the timing of the tour to coincide with the release of the film *Pocahontas* is just a coincidence, but is reassured by a Disney executive that it is "simply Disney's way of giving something back, of saying thank you". Thus the author is fore-armed with a sceptical outlook, not least because the exhibit is housed in a shopping centre, which even if the only suitably large venue, makes a clear connection to the commercial nature of the event. Indeed US department stores have been described as part of the 'exhibitionary complex' of society, along with museums (Bennett, 1994) both sharing a similar 'rhetoric of display' (Vergo 1994). The next reference to interactivity directly challenges the use of the term in the tour title:

> "…my traipse through this maze of painted ply – squeaking lily-pads notwithstanding – was as awe-inspiring as a queuing for a bus, the most **interactive** element being the eyes of the grown-up minders meeting across a crowded passage as we ran the gauntlet of racing five-year olds"

So far the tour does not meet the author's expectation of interactivity apart from the human social interaction. Further descriptions of 'what look like' toys and a 'giant crèche' along with the suggestion that 'racing five-year olds' appear to enjoy it, utilises the *Hula-hoop* theme: the tour is 'interactive' insofar as it is aimed at and appears to appeal to children.

> "Next stop the **Interactive** Animation Kiosk… Invited to "experiment with colour", children select a colour, followed by an item of apparel which then floods with green, brown or whatever colour has been chosen. Whether this really gives "would be animators" the chance to "make their dreams come true and become a Disney artist" seems a touch optimistic."

The extensive pull quotes, possibly from marketing material, allude to the promise of what the interactive kiosk is supposed to provide, but the author is again sceptical and attributes the mismatch of expectation and reality to, at best, misplaced optimism. She acknowledges perhaps a cultural difference between Disney – its executive who accompanies her is "young, American and full of zeal" – and herself, a cynical journalist who finds the tour "about as interactive as a talk-your-weight machine". Is the author suggesting that such machines are not interactive and therefore neither is the exhibition, or that such a level of interactivity is not the standard required or expected? Perhaps, even if considered interactive, the content of a 'talk your weight' machine's output is the issue, as is the content of the exhibition.

The article moves on to discuss Disney's considerable merchandising business where "as adults tire of the heavy handed hype, the emphasis is increasingly on children". Focussing the interactivity on, or associating it with children is perhaps a way of recalibrating expectations, allowing Disney to redefine what interactivity means for a different generation. Of course Disney would later be implicated by Baudrillard (1997) in a style of interactivity emerging in some museums, which attempts to force the audience *into* the art, as noted under the *Aesthetic* theme. But at the time of this article, Disney had just embarked on a new relationship with interactivity, having launched a new division called 'Disney Interactive', following its successes in 'interactive' CD-ROM and multimedia development. It had even overcome some internal scepticism over interactivity of its own[152].

Naming the new company division 'interactive' was the standard approach at the time – Universal, Virgin, Paramount and Sony among others had all launched 'interactive' divisions – as media companies sought to compete on the new digital landscape and particularly in the CD-ROM games market[153]. As noted in the content analysis, over ten per cent of the configurations coded for interactivity were actually business names. Disney had an even

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[152] Disney Chairman Michael D. Eisner had previously been sceptical "about the information highway", as reported in "Disney to sample interactive era", by Geraldine Fabrikant, August 9, 1994, *New York Times*, available at http://www.nytimes.com/1994/08/09/business/disney-to-sample-the-interactive-era.html [accessed May 3, 2011]. Eisner had also said of interactive media, "I don't like it so we won't invest in it" (The Superhighway Summit, Academy of Television Arts and Sciences, Los Angeles, January 11, 1994).

[153] See "Move over Sega, here come the conglomerates" by Amy Harmon, *Los Angeles Times,* June 21, 1994.

earlier association with the concept of the interactive presentation, however, having developed among other efforts "an interactive 3-D experience" at their MGM studios in 1989 for housing a new acquisition, the Muppets[154]. Perhaps for these reasons, the author of this article is not willing to let the issue go:

> Under sustained pressure, Heather eventually admitted that "the most **interactive** aspect of the show is the animators"… real-life animators from Hollywood, give 10 minute demonstrations of how they draw Pocahontas/John Smith/Flit. Heather explains to me that the purpose is to counter the idea that Disney films are generated by new technology. "Every cell is hand-drawn thus maintaining the integrity of the artists". Other integrities are less well observed."

This last reference is to the debate over the content of the Pocahontas film, considered to take 'outrageous liberties' with the facts, as a citation in the article quoting historian Roy Porter in the *Sunday Times* puts it. This connection between interactivity and the integrity of communications is explored further in this analysis. But as with the 'talk your weight' machine, the content does not befit the technology. For now, the most interactive element of the exhibit for the producers, is the social or performance interaction of animators discussing their work and answering questions from children:

> "Heather had told me that the questions asked by the children showed the **interactive** nature of the road show at its best. They were, she said, "really insightful". Two questions were forthcoming in my session. The first: "Why do you like drawing Pocahontas?" (after the poor man had spent five minutes explaining his job was drawing John Smith). The second: "Which is your favourite Disney toy?" OK, so I'm an old cynic. The kids, you might say, had some fun and the mothers a break."

The author somewhat resolves the issue of the tour's interactivity in a number of ways. First, the tour appealed to children and therefore must have met their expectations of interactivity on some level. However, this approach is also part of Disney's marketing technique and the value of a question and answer session for children along with other 'interactive' exhibits appears doubtful on the basis of the content outlined. An adult has difficulty reconciling the event with the description of interactivity, but regardless the 'kids' had fun, further invoking the *Hula-hoop* theme. Baudrillard (1988) states that Disney creates an "infantile world in order to make us believe the adults are elsewhere", part of an imaginary which is neither true nor false (ibid:p.172) which appears to work for children, if not for adults.

Secondly, a number of variations on interactivity appear to co-exist within the exhibit either at a basic 'talk-your-weight' level with the interactive animation kiosk, or at a more performative level with the animators themselves, even if the author does not quite accept either as fitting in with her understanding of interactivity. Thirdly, she admits that as an 'old

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[154] "Muppets to become part of Disney empire" AP, *Gadsden Times,* September 1, 1989.

205

cynic' and therefore naturally sceptical, her expectations and sense of critique may be too highly tuned. But her overriding scepticism is rooted in the fact that the tour is styled by Disney as 'interactive' and remains unconvinced as to what that means beyond allowing for cross-media publicity material. She gives the last word to a mother who warns that regardless of her child's appreciation, she will still demand a Pocahontas doll as well, thus the commercial theme is also responsible for driving much of the scepticism in the article.

b) Interactivity and the 'tabloiding' of communication
This issue of the styling of exhibitions and displays as 'interactive' is raised in another article from the same year, on the restoration of King House in County Roscommon and its opening as a tourist attraction. Following an introduction describing the previously dilapidated state of the house, the author states that "the house has been turned into a theme park, consciously designed to appeal to as wide an audience as possible"[155]. While evidently disapproving, he acknowledges that without "this tourist element", one of Ireland's last provincial town mansions would have been lost. His scepticism around the approach taken to styling of the attraction is detailed further:

> "Tours are "self guided". Each room has an infra red sensor which activates a dramatised commentary on its contents. The first two are devoted to Gaelic Ireland with two plaster figures of Irish chieftains - caricatures, really - carousing at a table. A whole chicken and leg of venison are not of the rubber variety, but the real thing dipped in some sort of preservative."

The tone here is slightly mocking and the notion of a self-guided tour is treated with scare quotes, suggesting it is a dubious approach for visitors to such an historic place. Technology activates 'dramatised commentary' thereby pushing the presentation further towards fiction. The characters are carousing "caricatures" and therefore may not be historically accurate and of course being made of plaster are also not real. On the other hand the food is not fake but real and apparently the only real element in the display. But the author's tone suggests this is also somewhat out of place and its preservation ironically is represented as an odd choice for an exhibition aiming to preserve the house in which it is exhibited. The author continues:

> The arrangement of the exhibition is **"interactive"** rather than "don't touch". You can try writing with a quill and ink, or make a crude leather shoe or dress up in a tweed cloak to see how brooches work. Upstairs, in the rooms which tell the story of how the house was restored, you can even try your hand at building a vault, using lightweight mock cut stone."

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[155] "The return of the King" by Frank McDonald, *Irish Times,* July 15, 1995.

The scare quotes appear again, this time raising questions not around the meaning of the word 'interactive' but about the very idea of an interactive exhibition. It is clearly presented as allowing visitors to touch exhibits – as opposed to "don't touch" – but the author appears less than comfortable with the idea of handling objects and dressing up. The selection of activities are presented as anachronistic and simplistic and, along with the words 'crude' and 'mock', create an impression overall that the author considers the design to be inappropriate for the house. The last person to live at the house, a 'sprightly' 75 year old Ms Dennehy comments on the refurbishment:

> "They've tabloided the house, but then I suppose a lot more people read the tabloids than the *Times*…"

There must be a sense of poignancy in seeing one's childhood home converted into an exhibition and transformed from private to public space[156]. Her use of the term 'tabloided' at one level conveys a sense that she understands that the house, as museum, is now a kind of medium for communication to which different editorial standards can be attached. But it also reflects common anxieties emerging in the 1990s around the perceived 'dumbing down' occurring across educational, political and cultural environments and embodied in the rise in readership of tabloid newspapers (Barnett, 1998). Barnett suggests that care must be taken when making an association between 'tabloidisation' and 'dumbing down', suggesting that popularity does not in itself cause the erosion of culture, but the specific intent of media producers, the "integrity" of whom needs to be actively protected from the relentless pursuit of profit, in order to prevent further erosion of culture (1998:88). Ms Dennehy accepts that popularity is important for the house, as the exhibition has effectively saved it. The intent with the exhibition is preservation, achieved through engagement with the public in an interactive exhibition design. And, even if exhibits are sometimes dipped in 'some sort of preservative', they are not completely 'fake' and the integrity of the exhibition designers appears to be upheld.

c) True or False: Interactivity holds more hype than promise

By the turn of the 21st century, interactivity had achieved the status of 'buzzword', and made appearances in headlines and in multiple references as a key media concept. Two articles directly address questions around the value of interactivity and its contribution to new media. Both were published in *Computimes* and were written by freelance contributors connected to

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[156] The conversion from private to public as well as interactivity may be associated with dumbing down. This attitude contrasts however with occasions where conversion of an historic house to a museum is seen as a positive development such as with the 'Joyce' house at 15, Usher's Island in Dublin – see "The Dead house comes alive", *Irish Independent,* November 11, 2003 http://www.independent.ie/unsorted/features/the-dead-house-comes-alive-195738.html. A different outlook may also be held where the house itself is more modest.

an internet development company associated with the dot com boom in Ireland[157]. The first article associates interactivity specifically with the internet:

> " "**Interactivity**" is one such bandied-around word that should be clarified, because even though many different levels of **interactivity** exist, all are lumped together as one. If we're to believe the hype, everything with even the vaguest connection to the Internet is fantastically **interactive**."[158]

The use of scare quotes and references to hype is strongly representative of the sceptical theme. The reference to 'levels of interactivity' adds a qualitative note, implying that some levels may be worthy of being taken more seriously than others. The author describes a number of communication events with different levels of interactivity and compares the interactivity of internet use with reading a book:

> "…does this so-called lack of **interactivity** between book and reader really mean that we get more, in terms of learning and involvement, from the Internet and its associated technologies? Band-width is expanding all the time, and God only knows what we'll be offered in the future, but for the moment, the danger is that the more **interactive** we believe technology to be, the less able we'll be to **interact** with anything - books, technology, even each other."

The potential of interactivity is associated with bandwidth, a purely technical feature of the data capacity of internet connections. Yet the writer locates the interactive experience within the belief of users (or other groups collated under 'we'). This goes beyond the 'perception of participants' definition to 'belief of participants', as well as invoking God as ultimate technology forecaster under a *Futuropia* subtheme. Anxiety over the negative effects of new technologies arises, where interactivity causes attention span deficit, the end of books and perhaps the breakdown of society altogether. The author next reveals that interactivity may in fact be a mirage, or an illusion:

> "No matter how much frantic clicking and explorative mousetrotting we do around the Internet or in a computer game, every single movement has been meticulously and mathematically pre-programmed. This leaves little room for human imagination, despite the dazzle and flash before our eyes… The problem is, we imagine we're absorbing information while reading online, because we think we're **interacting** with all the flashy distractions and movement."

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[157] nua was involved in web development and publishing internet surveys since 1996, In 2000 Eircom took a 20% stake in the company, but the company collapsed later in 2001, as reported in "Bubble unburst; the Irish dot com legacy", by John Collins, *Business & Finance,* November 3, 2005 [available at http://www.businessandfinance.ie/index.jsp?p=413&n=417&a=1903, accessed April 28, 2011]. The company's founder and then MD, Gerry McGovern had published several books on digital media.
[158] "The illusion of interactivity" by Catherine McDonnell, *Irish Times,* November 13, 2000.

Interactivity is nothing more than 'dazzle and flash' and so like the back stage machinations of a magician's set, all the supposedly unlimited actions of this dynamic space are a set up. The author has shattered the belief system in operation leading to concerns about the long-term psychological effects of internet interactivity. The suggestion is that developments in external communication processes may be eroding internal psychological processes. This final cheerless note of eventual submission to the externalising effects of the interactive advance, along with the arguments leading to it, anticipate Manovich's (2001) 'myth' of interactivity, as part of a post-structuralist agenda towards externalising mental processes. Yet there is little reason given for such ominous predictions, or facts or research to support them, leading to the conclusion that the author, while an internet professional, is ultimately expressing a personal point of view.

This article illustrates the mythical and religious discourses and dystopian views which circulate around interactivity reflecting scepticism. Through these discourses the author exposes a certain level of hype and challenges the expectations of interactivity. But despite her professional experience, the article is essentially an opinion piece, which does not cite any other sources and does not inform readers as to what interactivity means.

The next article published a year later takes on the hype, asking why interactivity has 'failed to deliver on its promises'. It features the most frequent occurrences of the research topic in any article in the sample, with the words 'interactive' and 'interactivity' appearing 14 and 20 times respectively. The opening paragraph includes two sets of scare quotes, along with the terms 'vague' and 'buzzwords', setting the tone for a highly sceptical article. The first reference links interactivity (and the hype surrounding it) directly to CD-ROMs:

> "When they first appeared, **interactive** CD-ROMs were feted as more than just a receptacle. Apparently, some strange alchemical transformation had occurred during manufacture, imbuing the discs with occult qualities."[159]

Echoing Aarseth's (1997) suspicions about the 'magic power' conferred on interactivity, and noting its unfortunate association with CD-ROMs (as had Winston, 1998 and Shultz, 2000) the author conveys scepticism about the hype and goes on to describe interactivity as the 'tip of a marketing iceberg'. The next reference draws connections between interactivity and technologies associated with it on the web, reflecting the static/dynamic dichotomy frequently discussed around ICTs:

> "…a website using an animation product, such as Flash or Shockwave, is commonly assumed to be **interactive**, whereas anything more straightforward and simple is perceived as static."

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[159] "Click here to communicate" by Dave Walsh, *Irish Times*, September 17, 2001.

Next the author acknowledges that interactivity has a currency beyond the internet in the art world, quoting artist Sean Hillen saying "…the mere mention of the word **'interactive'** has me searching for my revolver - just because the word is so abused." The use of scare quotes within the quote, expresses the artist's exasperation with the concept, but also adds weight to the sceptical view. In this instance, the frustration appears to be with misuse or overuse of the term rather than issues around its actual meaning.

The article runs through the origins of the concept – in interpersonal as well as HCI contexts – and the many communication events in which it might arise, making reference to many of the other themes outlined in this analysis. However, as the author begins to work through different kinds of interactive communications, he recognises that there are "levels of **interactivity**, running from passive experience through to "true" **interactivity**". The author makes the distinction between interactivity for its own sake and the kind where "the **interactive** element of the site is a means to communication with other humans, not an end in itself". In other words there is a strategic form of interactivity with ulterior motives for at least one of the participants in the communication. This directly alludes to the role of interactivity in communication strategy and is contrasted with 'truly interactive' experiences:

> "So what of a truly **interactive** experience, in which a single user communicates with an electronic entity, achieving some level of user satisfaction? This is, perhaps, what many people unwittingly expect from technology, and it could have us straying into the murky ontological minefield of artificial intelligence. At its most simplistic level, a truly **interactive** technology is one that constantly responds to changing conditions, such as the actions of the user."

The author suggests that people have a kind of subconscious expectation from technology – perhaps because of discourses around the potential of artificial intelligence (AI) – and this may be responsible for the mismatch between hype and reality. Whether the people in question are the users or the designers behind the interactive potential is not clear. The levels of interactivity however are under the control of digital media producers:

> "In terms of technology, **interactivity** gives the illusion of freedom and choice. No matter how flexible an **interactive** technology claims to be, the limits are always defined by the creator. The results can seem no more adventurous than a child's Fisher-Price activity centre. When designers and website owners becomes bogged in artifice and techno-fetishism, the sensual, practical or commercial aspects of their respective projects are swept aside."

The implication here is that 'true' interactivity should offer unlimited options for users and anything less is a mirage. Artist Sean Hillen is quoted again, referring to "an intoxication with the potential of electronics in particular, not least because most people have no understanding

of it". References to intoxication and fetish both echo discourses around the supernatural aspects of interactivity in the literature. Again it is unclear whether it is the users that have no understanding and therefore develop unrealistic expectations or whether it is the designers who lack comprehension of what their products really can or should do and rely on magic tricks of the interface. In either case, however, interactivity itself is not the problem as much as the lack of clarity around its meaning. The author's reference to AI reflects ideas around the meaning of existence that are challenged by technology. Suchman (1987) suggests that the is a 'social object' because a computer's reactions are purposeful and therefore are not random but *by design* (ibid:604, my emphasis). The question then should be what digital media creators understand interactivity to be and how they design it. So is there no such thing as 'true' interactivity? The author attempts a description, relying on the emotional elements of the aesthetic theme:

> **"Interactive** technology should be involving and personal - like successful film, theatre or music, it should win over the human user by reacting and anticipating their needs. Performance is naturally **interactive** - the musician engages the audience, the audience reacts (however favourably), the musician responds, and so on."

The author drops the sceptical tone and identifies the standard which interactive technology needs to emulate in order to be considered 'truly' or 'naturally' interactive. The article ends with a summation of the author's binary analysis of basic vs. true interactivity:

> "At a basic level, **interactivity** in new media indicates our ability to obtain a response from a metaphorical environment. But in a truly **interactive** environment, the visitor should have the power to modify this environment in an original and individual manner, and with lasting consequences."

The author's scepticism is allayed by the *Aesthetic* perspective which is considered the most appropriate for 'true' interactivity. This view is shared in an article referenced amongst a number immediately following the article as web links, offering further resources on interactivity, and indicating the source of some content. These include references to Heeter (2000) and Sims (1997) but Shedroff's (1999) visual essay 'What is interactivity anyway?' is clearly the inspiration (as the same question appeared in the article) as well as guiding the overall tone[160].

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[160] Available at http://www.nathan.com/thoughts/interpres/index.html [accessed May 1, 2011]. This essay presents questions and answers on interactivity for a web design audience from a distinctly sceptical perspective. The answers differentiate between what is 'kind of' and what is *not* interactive. Shedroff describes a spectrum of 'passive to interactive' media, which has an impact on the quality of communication. He ascribes quality communication to the creation of community but is sceptical about the use of the term interactive to describe particular communications (the list of what *is not* interactive includes CD-Rom, interactive television and reading a book).

d) Intent and integrity in interactivity

The final aspect of the sceptical theme addresses the appropriateness of interactivity in particular communication contexts. By 2007 interactivity has reached a level of acceptance in media and communications to the point of being an active business strategy, particularly in radio broadcasting, much as it has been in television as noted under the *Commercial* theme. This article discusses the context and the fall out from comments made about interactivity at the Sony Radio Awards in London.

> "This year BBC Radio 4 presenter Eddie Mair won a prestigious Sony Gold Award for **Interactivity**. His reaction? To rubbish the whole idea of **interactivity**. Mair wasn't addressing the supposed "added value" given by broadcasters and newspapers – either through red buttons on the remote control or their sprawling websites – but the added avenue given to the public's opinions. Traditionally, he said this week, "the only thing the listener had to do was listen."[161]

Mair's issue was with the amount of radio content now provided by a "bunch of unqualified loons", which he described as "the backbone of radio with no backbone". The issue for this analysis is that the empowering aspects of interactivity have led to media professionals questioning the value of interactivity because there appears to be a disempowering effect on them. This echoes other business interests who expressed similar concerns under the *Commercial* theme.

The author acknowledges that much radio content in Ireland is also now provided by 'interactive' listener comment and reaction. The previous articles in the sceptical thread bemoaned the 'illusion' of interactivity which pretended to hand over control when really the entire communication is 'pre-programmed' and 'by design'. By contrast, this article highlights the dangers of handing over too much control through interactivity, with hosts needing greater skills to filter 'the raving from the rational', a kind of on air moderation that is more challenging in live broadcasting than online communications. The situation is not confined to radio however and the author suggests that interactivity has make broadcasting as a whole more complex:

> "On television, **interactivity** has become a troublesome necessity whether it's through comments, opinion polls or endless quizzes. Countless chunks of news broadcasts are now given to pointless polls or viewer's e-mails."

Whether the interactivity has forced producers to make screen space and time for this content or has provided a highly economical source of material to fill an ever expanding news 'hole'

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[161] "Text length words of wisdom" by Shane Hegarty, *Irish Times,* October 20, 2007

is not explored. The author is more concerned with the impact interactivity has had on the working lives of those in media production:

> "The burdens placed by the wider use of **interactivity** have proved obvious. The recent scandals on British television, already rife through the BBC have been added to by ITV's announcement that it pilfered EUR11 million from viewers. The extra demands that phone-ins and text competitions place on those working in radio and television shows contributed to them falsifying competition results, inventing winners and misleading viewers."

The author takes a technologically determinist position, where interactivity forces producers to cut corners and get into trouble. This is a different position to that of the BBC's Mair, who was really complaining that interactivity is used strategically by producers as a cheaper form of sourcing material than paying human researchers, warning that programmes would soon be based on "what listeners rather than the well paid professionals decide". Twelve years earlier in another article from the sample on how radio was reacting to the internet, BBC 1 DJ Andy Kershaw had clearly expressed his bafflement at the BBC's "Interactive Week" initiative, introducing his show as follows:

> "Now, another **interactive** radio programme….I play the records and you listen!"[162]

Broadcasting was perhaps simpler then. In 2007, the issue is increasingly tied up in the confusion over what it means to be a print journalist, radio host or television producer when platforms are merging and the public has ways of viewing radio programmes, listening to newspaper content and texting television. The author admits:

> "There is an irony in me writing on this topic, given that I've been writing a blog on the Irish Times website for six months. What is that but a sop to **interactivity** and a new avenue to air the public's views?...It would be snobbish of any professional journalist to presume that the public's contribution is pointless – but in the wrong format it pretty much is. **Interactivity** is often worthwhile, but does it mean that we need to keep shovelling opinions into a digital landfill?"

The 'wrong format' is a polite way of saying there may be no one at the receiving end. Much of the interactivity facilitated in broadcasting and commentary online generates more content than can ever be reciprocated upon (particularly if facilitated as part of an exercise to reduce spending on production), which brings into question how interactive the communication may actually be in the first place.

This article explores the sense of frustration among broadcasters and journalists at the idea that opening up communication with the audience is always a good thing and, that this is what interactivity means, without addressing the results from or quality of that communication

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[162] "Ryan on the Internet: Radio 2FM's first 'Internet Week' starts today" by Michael Kealy, *Irish Times,* July 17, 1995

process. In a sense, the scepticism here is not so much with the concept of interactivity, but with how it is applied and used. Andy Kershaw is perplexed as to why the BBC suddenly started calling radio interactive, when that essentially describes what he has always done. Meanwhile Eddie Mair dislikes the assumption that the public needs to be indulged further when professionals have properly looked after their needs for years. The article author senses that interactivity is having a profound effect not so much on the communication occurring in and with the media, but on what the media understands itself to be.

In 2008 Sony removed the 'interactive programme' category from its annual radio awards and introduced the award for 'Best use of Multiplatform', to "celebrate multiplatform activity". The category description makes no further mention of interactivity. It appears Mair's questions about the idea of interactive radio had succeeded. However, by 2010 rather than specific interactive programmes, 'audience interactivity' had become a central feature of all broadcasting, as the BBC Editorial Guidelines illustrate. Section 17 outlines the corporation's approach to interactivity with audiences in its programming, listing many of the by now familiar options for interactivity in production:

> "17.1 **Interactivity** allows our audiences to engage with us in many different ways; from voting for a contestant who could win a life-changing opportunity, taking part in viewer, listener or online competitions, raising money for charity, or playing an online game, to contributing to radio phone-ins and even deciding which match to watch at Wimbledon or the ending to a popular series or drama. **Interactivity** provides choice and gives opportunities to be heard, to participate and to create content. We aim to offer it to everyone by using our different platforms in different ways, but we will not exclude viewers and listeners who choose not to interact.
> 17.2.3: When we offer **interactivity** to our audiences on our publicly funded channels, it must add public value and enhance our output in a way which fits our public service remit. It must also be distinctive, have a clear editorial purpose and match the expectations of the likely audience."[163]

Rather than offering a definition of interactivity this presents an open-ended list, which tends to provoke sceptical attitudes towards interactivity due to the variety of scenarios involved. The *Empowerment* theme arises through engaging audiences, although it is perhaps the BBC who deigns to empower rather than the technology itself. The reference to audiences who 'choose not to interact' addresses a perceived concern about the obligation felt by audiences in changing media paradigms to change their behaviour. Finally, the BBC seeks to reassure broadcast professionals that editorial standards still apply. But while broadcasters are aware that audiences and producers have different expectations and responsibilities in relation to interactivity, they are taking the concept seriously enough to issue instructions on its use.

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[163] http://www.bbc.co.uk/guidelines/editorialguidelines/page/guidance-interactivity-summary [accessed March 13, 2011].

e) Conclusions on the Sceptical theme

The analysis of this theme explores the association of interactivity with hyped-up events and technologies and with the dumbing-down of communication contexts. It examines the failed promise and true and false versions of interactivity, and its impact on communication strategy and integrity among media professionals. Overall, interactivity raises questions for a number of discourse communities not just in relation to its own definition and meaning but in terms of the impact it has on particular communication events, general media consumption and production practices and potentially on wider personal and social communications.

The first article expressed scepticism over use of the term 'interactive' by a large media conglomerate in an entertainment and marketing initiative aimed at children, thus sparking a competition between both *Hula-hoop* and *Commercial* themes. Questions arise where the level of expectation from the interactivity of the presentation is not matched by the content. In other words, high quality content may be expected from interactive communications designed by media giants, and failure to match expectations generates greater scepticism around the term. But scepticism also generates an element of self-reflection, where the author questions her own perhaps over-critical outlook. This does not arise in the next article where interactivity is presented as a choice in exhibition style, which although popular is considered less appropriate than traditional exhibition communication styles. Whereas interactivity hyped up poor content in the previous article, here it dumbs down quality content in the exhibition context. This suggests its role in communication is qualitative but also relates to the integrity of the communication event.

By 2000, scepticism is the official discourse of interactivity the 'buzzword'. It is associated with the illusion created by a pre-programmed setup operating in the background of interactive communication events. True interactivity reflects aspects of the *Aesthetic* theme but is differentiated from other lesser kinds of interactivity. This scepticism emerges from the aesthetic fields and the problems associated with the 'fetishization' of technology. Intertextual references from a variety of sources show interactivity is a work in progress but of particular concern to web development professionals whose understanding of it must affect expectations in interactive communication events.

Finally, suspicions and frustration surround interactivity because of the impact it is perceived to be having on the media profession. Top down demands by management to increase the use of interactivity and yet to also control its use, is conflicting with the journalists and media producers sense of autonomy and integrity. The *Empowerment* of the audience through interactivity is the source of much of this frustration. Although throughout the thread, scepticism arises over interactivity wherever expectations from the content, format and function of communication are mismatched, resulting in failed or frustrated efforts.

The closer a discourse community is to the design and production of 'interactive' communications (for example web industry professionals), the stronger their scepticism and the more it relates to improper use of the term or a misunderstanding of the technologies involved and how they are used. But the closer a discourse community is to use of interactive communications or to being the intended 'audience' (for example children at a Disney exhibit), the better they understand the intended match between communication and result, and are perhaps less sceptical as a result. Ultimately this may allow other more positive themes to override the *Sceptical* theme, such as *Hula-hoop* (with children's exhibits), the *Aesthetic* theme (in relation to experience), or *Futuropia*, offering a progressive view of communications of the future.

9.3 Analysis of the Information Society theme

The IS was the least frequent theme found in the sample, despite being a significant discourse in both the academic and public policy literature. Where it does arise, articles coded with this theme can be divided roughly into three types: those reporting directly on IS policy, those invoking the IS in relation to specific technologies and those citing the IS as rationale for government policy.

a) The G7 and the Infobahn

This analysis focuses first on an article from 1995 referring to the development of information society policies and initiatives internationally. It then follows a thread of articles through to 2009 to explore how IS discourses developed over the sample period and how interactivity was represented at various points in the discourse.

"G7 announces on line projects" by Michael Cunningham, February 27, 1995, *Irish Times*

This article covers the meeting of the G7 group of leading industrial nations who had convened in Brussels "…to debate the legal, technical and social ramifications of the information revolution". The author outlines the purpose of the meeting, the events happening around it, such as a multimedia showcase which generated more popular (and media) interest perhaps than the meeting itself, and questions the 'concrete proposals' if any that emerged from the summit. Two of the key players in IS policy development in the US and EU are referenced in the article: US Vice-President Al Gore and EU Commissioner Martin Bangemann while Ireland's then EU Commissioner Padraig Flynn is also quoted. Particular focus is placed on EU representatives and the policy initiatives emerging from the European Commission.

The author only uses the phrase 'information society' once in the article, when describing the function of the High Level Group of Experts set up by the European Commission. Other descriptions used are the 'information revolution', the 'information highway' and the 'infobahn', which appears twice. This is an example of overlexicalisation leading to simplification rather than explanation of the concept of the IS (see Deacon et al, 2000, Van Leeuwen, 1995). It displays awareness of geographic and perhaps socio-political variations on the concept of the IS. The 'information highway' and the 'infobahn' are more closely associated with US discourses on the IS, even though 'infobahn' incorporates a German suffix related to the word for 'highway', it is used more often in the US context[164]. This suggests that the author of this article is operating in a context influenced more by US sources and discourses than European sources which tend to use the phrase 'Information Society'. The first reference to the research term is in a list of 11 joint international information society projects announced by the G7, which includes:

> "Cross Cultural Education and Training global networks – to promote new ways of learning languages, extending the availability of **interactive** teaching material, and facilitating international contacts (co-ordinating countries: France and Germany); Electronic Libraries – a global electronic reference library, accessible to a large public by **interactive** technologies (Japan, France)."

Throughout G7 and EU IS policy documents, education is presented as an important feature to be 'promoted' and 'made accessible' with new technological developments wherever possible. In this reference, the overarching theme operating is the IS, a grand vision to be achieved through the support of these projects by the G7, but the references also carry other subthemes of interactivity. The CCET project invokes the *Pedagogical* theme, linking interactivity with teaching materials and associating it with a pedagogical style or event in teaching methodology. The electronic libraries project associates interactivity with making resources accessible, invoking the *Empowerment* theme albeit at the lowest level.

In its own documentation, the G7 promoted an even broader application of interactivity in overall IS policy. In his opening address to the summit, Commission President Jacques Santer suggested that such education and knowledge access projects would do no less than "enhance peacemaking in the world", based on the hope that the projects would:

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[164] Online searches generate far more results for references to 'infobahn' from US than from German sources. In fact the correct translation of 'information superhighway' into German is 'datenautobahn' as using the suffix '-bahn' without 'auto', makes little sense in German. But the reference probably alludes to the ideal of the autobahn renowned for having no speed limits (although it has advisory limits) compared with the relatively restricted speeds of US highways and indeed any other European neologism for the same ideal e.g. 'info-route', 'info-strada' especially 'info-bóthar'. It is also perhaps more catchy than the ISH.

> "…reinforce our democratic systems by increasing communication, openness and transparency within and between our countries. They may well change the political process for example through a more **"interactive"** electorate!"[165]

Santer was prescient perhaps in connecting interactive communications with ideas around democratic empowerment of individuals. This gained more widespread currency in the early 2000s when internet access and delivery speeds could enable such communications, and has gathered momentum since the rise of 'social networking' more recently. But Santer presents a technologically determinist view of the IS in 1995, a society that would be realised through increased development and use of ICTs. Whether it has actually changed the political process or created an 'interactive' electorate is another question and goes back to an essential critique of the IS concept – whether such a technologically determinist view and policy direction can ever impose such far reaching social, economic and cultural effects. Santer chose to end his speech with a quote from Ilya Prigogine, physicist and Nobel laureate, who ironically perhaps, was soon to publish a revolutionary book calling for the end of 'determinism' in science and society[166].

At the end of the conference, the G7 formally concluded that "**interactive** applications will change the ways we live together". This would occur because:

> "**Interactive** multimedia services and applications are the most visible components of the information society. Their emergence and eventual penetration at all levels of society means rethinking and restructuring the traditional communications methods… G7 partners recognise the impact **interactive** applications will have on society and are committed to: Share experiences on emerging applications..; Act as a catalyst for the promotion of research, applications and generic services..; Promote joint projects to demonstrate our commitments…"[167]

Putting aside the strong technological determinism presented here, the G7 references to interactivity are among the more interesting of the policy descriptions during this period. First, they acknowledge that there is more than one 'way' in which 'we live together', and therefore a variety of impacts may be felt from interactive applications. Describing interactive ICTs as one of the 'most visible components' of the IS links increased ICT use with the IS (as is commonly done in IS theory), but emphasises *interactive* ICTs in particular. This is the first specific definition of interactivity as a 'component' of the IS, or a part of the mechanism. But it also indicates that somewhere, someone at the policy documentation level understood that it is in the actions of policy makers, in supporting and promoting specific tangible projects (as

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[165] Opening address by Jacques Santer at the G7 conference on the Information Society, February 24, 1995, EU SPEECH/95/17.

[166] The quote used by Santer is from the philosophical text *La nouvelle alliance*, by Ilya Prigogine and Isabel Stengers, Éditions Gallimard 1979: "Le temps est venu des nouvelles alliances, depuis toujours nouées, longtemps méconnues, entre l'histoire des hommes, de leurs sociétés, de leurs savoirs et l'aventure exploratrice de la nature". Then in 1997 Prigogine published *The End of Certainty* where, based on a study of chaos, self organising systems and the constructive role of time, he outlined his theory that 'belief' in determinism had to be overthrown in Western science and society.

[167] Conclusions of G7 Summit 'Information Society Conference', February 26, 1995, EU DOC/95/2.

in the 11 G7 projects), and not just generic interactive application types (which the Bangemann report described, as noted under the *Commercial* theme), that the IS *as policy* would be communicated to the wider public. The projects selected cover a wide range of structural, social and content related areas arguably much broader than the kinds of hardware focused ICT, science and technology projects supported under IS policy funding in the EU in subsequent years (see Preston 2003, 2007).

b) Information Society projects – content vs. delivery

There is no further discussion in the sample of the G7 projects. However, a final progress report was produced in 1999 outlining their success and highlighting the part interactivity played in their rollout[168]. The CCET (which became known as TEL-Lingua) project conclusions found that while networks between countries were up and running, it would take some years before content would make its way from the classroom to the online environment. The report no longer made any reference to interactivity. The *Pedagogical* theme of interactivity had succeeded in terms of describing the hardware and its potential for educational communication events. But the case for the qualitative value of interactive educational content still needed to be proved.

The Electronic Libraries project on the other hand reported success in bringing new library partners on board and, crucially, had built a digitised collection demonstration which was presented at the 1996 G8 Information Society conference[169]. The audience "observed the **interactivity** and ease of access to virtual and distributed digitized collections held by national libraries and other cultural institutions and how this knowledge can be effectively acquired and used by the end-user" (1996). In this instance, as mere observers, the audience were only a third party to the potential interactivity of the digitized collections. This interactivity enhanced their accessibility, presenting the *Empowerment* theme. But the real exchange is between 'knowledge' and its acquisition by the 'end-user', a growing element of IS policy promotion globally. While the project started out with a low level empowerment-as-access theme, the potential for further levels of empowerment and a pedagogical aspect of interactivity are developed through the demonstration. The success of this project is the inverse of the CCET project – the latter had the networks operating but little by way of valuable content. The libraries project however, though only a standalone demonstration, could potentially utilise the entire cultural content of Europe. Its value could be 'observed' as a more 'visible component' of the IS and it would continue to be supported as a project right through to its (still limited) current day successor, *Europeana*, arguably one of the very few content and culture projects now supported under EU IS policy funding. In this instance, more

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[168] G8 Global Information Society Pilot Projects Final Report 1999.
[169] A prototype built around the theme "Africa, Culture and Civilisation" was demonstrated at the G8 Midrand conference on the "Information Society and Development" in South Africa (1996).

value was observed in interactivity between users and content than between users and network or system.

c) Government at arms length

An exhibit at the 'fringe' multimedia showcase taking place alongside the summit provides the next reference to interactivity in the G7 article:

> "Some of the strange contradictions of the new technologies were embodied in a set of **interactive** kiosks on show, created by a company called Info/Texas. Like automated dole offices, they will streamline the US state's employment commission by cutting down staff - and, ironically, adding to the dole queues they will serve more efficiently."

Kiosks, or public multimedia information and service terminals, were becoming increasingly visible in public venues in the US and Europe by 1995 (see Holfelder & Hehmann 1995). Standalone terminals offered the public a different 'computer' experience to that of the CRT screen, keyboard, mouse and box that most would then associate with the concept of ICT use. The key differences for users were: a) location in public areas, b) facilitation of many anonymous users, c) use while standing up and, most noticeably perhaps, d) use of a touchscreen rather than mouse and keyboard. The touchscreen aspect was heavily promoted by the producers of the Info/Texas kiosks, who stated they were using "a 'TV-that-you-touch' metaphor, to make dealing with government both fast and easy for anyone regardless of education or literacy", as reported in an article in the US business press announcing their selection as a G7 summit exhibit[170]. The US Department of Commerce selected the kiosks for the G7 showcase because of the 'one-touch' ease of access to government information, suggesting the US wished to emphasise the 'e-government' aspect of the IS and the kinds of ICT uses which would be rolled out. They even included a "digital video narrative welcome by George Bush, Governor of Texas" to emphasise that it was a facility for users to connect with government. Associating these kiosks with television alludes to discourses around interactive TV, suggesting an entertainment interface for e-government content.

The G7 article author presents interactivity as a defining characteristic of the kiosks on show, reflecting kiosk descriptions of the time (see Holfelder & Hehmann 1995). But by alluding to their 'embodiment' of ICTs and the IS issues, interactivity is linked to the anthropomorphosis of these machines. This, along with their description as 'automated dole offices', links interactivity with increased automation in general and the effects this may be having on society. The image of a machine of human height, with a multimedia screen at head level with which users 'interact', along with active verb usage imputes quasi-robotic characteristics to

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[170] As reported in *Business Wire,* February 22, 1995 available at:
http://www.thefreelibrary.com/Info+Texas+Touchscreens+showcased+at+Brussels+G7+Summit

the kiosks. They *will* 'streamline' by 'cutting down staff', thus attributing responsibility for the potentially negative effects of the IS to this specific ICT configuration. Of course these 'strange contradictions' are as likely to be oversimplifications of public service provision along with unsupported assumptions on the impact of increased use of ICTs on employment. There is no evidence presented that public service workers would actually be replaced by interactive machines.

The author chooses to focus on the potentially negative effects, not on the beneficial e-government aspects promoted by both the kiosk manufacturers and the US government, perhaps because so much of what has gone before in the article (and what was being promoted in general around the IS) was overly positive. But this also highlights the difference of emphasis between EU and US policy. The author notes concerns about 'US dominance in media products' and how the French, Germans and Canadians "vowed to prevent the US from "hogging" the infobahn". The overall effect represents interactivity (as embodied in the kiosks) as suspicious and providing tell-tale evidence of one of the more pervasive effects (and measurements) of the IS found in both theory and policy – occupational change.

Much of the foundation of IS theory is based on studies which measured the changing nature of employment and occupations in the 'post industrial' society (Bell, 1973) and concomitant increases in 'information' and service sector workers (Machlup etc. cited in Webster, 1998). Initially, studies which measured changes in different employment sectors of the economy were used to indicate a shift to an information- based or a 'post fordist' society (Masuda 1981, Webster, 2002). However, from 1995 onwards, concerns about the potentially negative impact of the IS on employment and wages were already coming to the fore, as explored in another article under the IS theme in the sample, reporting from a conference held in Dublin on the 'Information Age'. There, a *New York Times* journalist spoke of the 'downsizing' effect of ICTs already occurring in the US, where the economy was growing exponentially in IS terms, but wages appeared to be stagnating[171]. The connection between increased use of ICTs and the improvement in the quality of life promised by early IS policy did not appear to be in evidence on the ground. That article also aligned interactivity (as "interactive video") with the "rosy convergent model" of the IS, as one of the many advanced internet services that would rapidly spread in a stabilised economy, rather than the "fragmented" model of the IS where:

> "…there would be electronic fraud and eavesdropping, broadband services would feature only as premium products for niche markets, viewers would pay for content,

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[171] As reported in "How soon is now?" by Karlin Lillington, *Irish Times,* September 22, 1997, where *New York Times* journalist Louis Uchitelle, author of 'The Downsizing of America', was speaking at 'Ireland in the Information Age' conference at Dublin City University. He announced he was there to "raise your stress levels about the computer age". His complete report for the *New York Times* is available at
http://www.nytimes.com/specials/downsize/glance.html

there would be multiple technical standards allowing a handful of companies to control technological markets, and finally, society would see the end of jobs for life."

Over a decade on from this prediction, it is difficult to see which of these features does not describe the IS as/if it exists today, at least in Ireland. But whether these outcomes are as a result of how IS policy was implemented (or not) or due to other influences is another question. In any case, the conference concluded that the future of the IS was more likely to be "some mixture of the two"[172].

The G7 summit article follows the 'interactive kiosks' reference in fact with some final comments on fears over the impact on employment of IS policies. Commissioner Bangemann warns of 'heavy job losses to begin with" due to the dismantling of the telecommunications monopolies but predicts that the situation would be balanced "within two to three years", clearly favouring the more 'rosy' picture of the IS as stabilised ICT economies.

d) G7 article - Intertextual Analysis

The article makes reference to two groups set up by the EU Commission to advise on "how to prepare for the Infobahn"; the Information Society Forum (representing industry and consumer groups) and the High Level Group of Experts (whose participants were to be chosen by the four relevant Commissioners: Bangemann, Wulf Mathies, Cresson and Flynn).. The reports produced by both groups over subsequent years provide an insight into how the concept of interactivity was presented and used in relation to IS policy.

i. Information Society Forum

The Information Society Forum represented six sectors including users, social groups, content and service providers, network operators, equipment manufacturers and government institutions. Its first (and only) annual report was published in June 1996 and makes a number of references to interactivity[173]. First it is a capability of new ICTs where "Multi-media text, sound and image can be exchanged **interactively**". Interactivity a characteristic of the medium and relates to the 'exchange' of data. In the next reference interactivity is presented a basic requirement for participation in the IS where "…people must have the confidence to use "information appliances" (personal computers, **interactive** televisions, video telephones etc) with easy familiarity…they must have access at affordable prices to these appliances and the services they make available." Interactive TV is a 'right' that people will have in terms of access, affordability and the services available, but there are concerns about systems reaching

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[172] Chris O'Malley of the DCU Information Society Group put it thus:"One thing we can be sure of is that the particular picture we each have of the future isn't going to happen".
[173] Networks for People and their Communities: Making the Most of the Information Society in the European Union, First Annual Report to the European Commission from the Information Society Forum, June 1996.

everyone in society and doubts "whether in the short term every home can be wired up for **interactive** multi-media, which raises the danger of discrimination against certain social groups, localities and regions". This is a reference to the 'digital divide' a concern in IS discourses at this time (see Selwyn, 2004). It is unclear however if interactivity is understood to add to the complexity of the infrastructure.

Meanwhile the Forum suggests a number of ways of minimising the dangers of a digital divide by proposing "…a commitment by governments to make basic **interactive** services (public information, education and health) available to all, irrespective of geographical location and at affordable prices for all. This is the essence of universal service…" This reference to 'universal service' suggests that the Forum considers such services to be a basic minimum rather than of basic interactivity. Adding these 'interactive' services of information, education and health is a much more complex provision than the communications services to which the Universal Service directive relates[174]. This lack of clarity around the use of the term 'interactive' reflects a tendency found particularly in public policy arenas, where it is overused as a generic adjective relating to any ICT related idea, without regard to its potential meaning.

Finally, the Forum was concerned with the generation of a market for services:

> "The growth of markets for **interactive** services based on multimedia and other technologies will continue to be slow unless public authorities themselves become a stronger source of demand, and unless they encourage greater private sector investment."

The Forum did not see the 'critical mass' envisaged by Bangemann as emerging on its own without a lead being provided by public authorities, as early adopters of 'interactive services'. Thus rather than being a hallmark of an IS, e-government appears to be an instrument to generate a market for multimedia and ICT services, to boost a sector of the economy which would itself be the benchmark of the IS. These proven ICT services would then be pushed towards private sector interests to increase market support.

Overall, the Forum report had little impact on IS policy development and was criticised, not least by European media publishers (who had their own interests to protect), as having an 'aimless brief' and providing 'a platform for opinions rather than recommendations'[175]. The report represented interactivity as a generic characteristic of new ICTs, a requirement of the IS, a tool to narrow the digital divide and an aspect of applications that will boost the growth

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[174]The Universal Service Directive established the principle of guaranteed access to basic communication services across the EU in 2002. As of 2011, Universal Service makes no reference to such servicesSee Universal Service at http://ec.europa.eu/information_society/policy/ecomm/current/consumer_rights/universal_service/index_en.htm

[175] See *The Information Society Forum's first annual report: A critique* by the European Publishers Group available at http://www.epceurope.org/issues/epc-information-society-forums-first-annual-report-a-critique.shtml This is a lobby group representing media interests throughout Europe in relation to EU media and communications policy and whose express aims are 'light touch regulation' and 'freedom to self regulate'.

of ICT markets. This lack of specific understanding of interactivity beyond general ICT adjective is a hallmark of IS policy documentation.

ii. High Level Expert Group

The HLEG final policy report noted that they were established to analyse "the social aspects of the information society". It included academic, industry, telecoms and media representatives as well as prominent 'network society' theorist Manuel Castells. From the outset the HLEG was regarded as challenging the technological determinism and liberalising agenda which dominated the debate on the IS, providing one of the few 'disruptive' voices in the discourse overall (Goodwin and Spittle, 2002) in counterpoint to the perceived private sector 'neoliberal' focus of the Bangemann report and action plan (see Henten and Kristensen, 2000). The HLEG final report was presented in 1997[176].

The first reference to interactivity directly addresses the *Pedagogical* theme:

> "What are the best means of teaching and developing a command of "cathodic" abstraction, virtual images, **interactivity** and fragility, including teaching those who fear new technology?"[177]

This reference actively queries how interactivity might qualitatively impact on the process and outcomes of learning, a concern to the HLEG who state that "schools serve a social and cultural development function which distance learning cannot", and for which it should not be a substitute. This kind of qualitative distinction is in stark contrast to the implicit acceptance by commentators in the *Pedagogical* analysis, and throughout the sample, that ICT use and interactivity in education is universally positive. It also indicates a level of enquiry and clarity of purpose absent from the Forum report.

Next, echoing previous policy documents that acknowledge a critical mass will be difficult to achieve in the market alone, the HLEG suggest that:

> "Public administration might…take the lead in the IS given the high risks involved in investing in new, **interactive** information systems, and open up new market opportunities"[178]

This shows agreement with the Forum that public authorities need to lead the way. However, the HLEG takes a carrot rather than stick approach, indicating they understand the mood of the market in relation to risk. They suggest that public administration systems have natural communications requirements that suit new interactive ICTs and that they can afford the 'high risks' involved, therefore having the ideal qualities to lead the IS in new ICT

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[176] "*Building the European information society for us all*", Final policy report of the High Level Expert Group April 1997
[177] Ibid. p. 25, '1c. Improving and disseminating knowledge on learning methods'.
[178] Ibid. p.27 'Public information services: the new engine of growth in the IS?'.

infrastructure projects. This was perhaps a questionable assumption, at least in the case of Ireland (see further). But it shows that the HLEG are focused on the complexity of the systems and incentives for development rather than the specific content or services provided. They understand that if public administrations take the lead they will be better positioned to shape the direction of the IS, rather than allowing market forces to dictate.

The final reference relates to market opportunities, as "In other sectors, **interactivity**, facilitated by digital communication, has created new trading opportunities…Now more than ever before, time has become a crucial and scarce production factor."[179] Rather than being a characteristic of the medium as it usually is in IS policy, interactivity is 'facilitated' as an aspect of a new level of communication with ICTs.

Overall the HLEG are more considered and qualitative in their proposals than the Forum and in several ways point to some of the critical features of interactivity, which help define its potential contribution to communication processes: First its *Pedagogical* aspect, as a qualitative element of knowledge transfer, which needs to be understood more fully to balance against the known benefits of social and collective learning; Secondly, its *Empowering* effect on communications particularly within and with public administrations; Thirdly, the *Commercial* perspective in its facility to open up new opportunities for business, balanced by the pressure that the 'death of distance' and compression of time might bring. Each perspective helps to flesh out further the role that the HLEG sees interactivity might play in the development of the IS. This displays a remarkably nuanced understanding of interactivity which unfortunately was not reflected in the IS activities of subsequent years.

e) Interactivity and the Information Society in Ireland

The sample makes a small number of references to Information Society policy in Ireland. The first is in a review of new websites launched by state institutions including the Government, which the Minister for Finance describes as "an essential element of the Government's approach to the Information Society"[180]. The article author embarks on a detailed criticism, questioning this approach to the IS when, amongst other issues, the "level of **interactivity** is mind bogglingly low". He attributes this to the lack of "devices for ordinary users to input information", such as forms, calculators and discussion forums. This clearly associates web site interactivity with facilitating a two-way flow of information, implying that so far, government only provides a one-way information flow from themselves. The author queries whether the IS is a "major extension of our democratic powers" or a "cosmetic exercise", reflecting what many felt was the emphasis on rhetoric rather than on actions (see Preston 2003, Garnham 2005). The 'level of interactivity' is presented therefore as empowerment for

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[179] Ibid. p.44 From time to work to time to live.
[180] As reported in "The state we're in" by Michael Cunningham, *Irish Times,* May 27, 1996.

the user in doing things online, but also as a measure of how serious the government (or any other state institution) might be in engaging in information exchange with citizens and in really facilitating an information society.

Another article observes this rhetoric vs. practice issue more acutely. It reports on the Eircom Information Age Town, an initiative in 1997 by the then dominant national telecoms provider to sponsor a prototype IS town (Ennis), where every citizen and school would have access to information society services. A 1999 article reports on progress in Ennis two years on, after thousands of PCs had been distributed to homes and schools, a range of online services had been developed and Visa cash cards launched in steps towards developing a 'cashless society'. While the projects gained some support, there was widespread criticism and the biggest problem reported with the Information Age Town project, ironically perhaps, was 'poor communication'. In this article, the Ennis IAT chief executive is quoted saying:

> "I take on and acknowledge that we haven't reached the heights of **interactivity** that we would want to get…"[181]

Notwithstanding the depiction of interactivity as a 'height' to be achieved, he may have been referring to interpersonal social interaction as much as digital communication. Citizens reported receiving no basic information on the project or training, nor the promised email accounts or computers (which were to be delivered to every home). In terms of IS policy rollout, the Ennis Information Age Town initiative was widely considered a failure, and questions remain over where funding was allocated, why basic IS infrastructure such as the promised town broadband did not materialise and why there was so little evidence of its impact even ten years on[182].

f) e-Government in the Information Society

The final article for analysis is from later in the sample and highlights the discrepancies in the way e-government is presented either as project, characteristic or goal of the IS and how this may have had an impact on interactivity. It reports on some of the more controversial e-government projects carried out in the first decade of the century. E-voting machines were introduced in 2002 as part of a plan to "underline Ireland's image as a modern and IT literate country"[183]. However, after reports raised security concerns, the project was abandoned[184]. The purchase and highly costly storage of the hardware was estimated to have cost the state

[181] "A town logs on to the information age" by Gordon Deegan, *Irish Times,* Spetember 24, 1999
[182] Reported in "Why Ennis's information dream did not compute" by Una Mulally, *Sunday Tribune*, February 11, 2007
[183] "Costs on some vote machines due to run until 2029" by Tim O'Brien, *Irish Times,* September 12, 2009, reporting on the long running saga
[184] See 'Electronic voting to get trial run in election' *RTE news* February 20, 2002, available at www.rte.ie/news/2002/0220/evoting.html [accessed June 2, 2011]

over €54m. It was however exceeded in cost by another failed e-government project, which was wound down in 2008:

> "The Public Service Broker was to be a key e-government project aimed at providing **interactive** customer services…to provide for exchange of data between Government agencies…"

This is as close a description to the kind of 'public administration' services suggested in the IS Forum and other policy documents as there is, in any of the projects reported on by the print media during the sample for this analysis. In his remarks on the costs to the state, the Comptroller and Auditor General concluded that:

> "…it was the nature of large-scale information technology projects that they can be overtaken by technical developments and the decision to abandon a project that is not working is the correct course because it avoids spending further public money."

This says little for the level of IT enterprise planning and research carried out in the public sector, fifteen years after the launch of IS policy in Ireland. Despite successive reports suggesting and recommending that public administration and e-government become a driver of the IS, they did not take the lead as an early adopter in Ireland and even in some instances, as noted here, failed to keep up with technical developments. The question remains as to whether interactivity is understood here as part of the original but failed 'large-scale information technology project', or the 'technical developments' that overtake such projects or is integral to the whole process. But the impact amongst the general public in relation to "interactivity" and public services is possibly that its meaning is tarnished by association with the waste of public money.

g) Conclusions on the Information Society theme
This analysis highlights the evolving representations of interactivity in the service of this theme. In the earliest part of the sample it is a feature of projects which are representative of IS policy. But interactive applications are also depicted as having a determinist effect in bringing about the IS through the services with which they are associated. The theme relies on assistance from the *Pedagogical* and *Empowerment* themes in particular to convey the benefits of the IS for citizens. However, the successful IS projects were those that placed more value on interactivity between users and content than between users and network or system and the *Empowerment* aspect wins out over the *Pedagogical* theme.
The difference between US and EU discourses around the IS is embodied in the US e-government interactive kiosks. This robot-controlled vision represents interactivity as instrumental in the occupational change which concerns EU policymakers. These dystopian

effects counteract the generally promotional tone of the IS in the coverage. The G7 group (perhaps attempting to harmonise both US and EU perspectives) presents a technologically determinist view of the IS and interactivity, where interactive ICTs will bring about the IS. However, this is expressed in visions, concerns and emphases rather than tangible examples that show the potential at work. Ideas around interactive ICTs being the most 'visible component' of the IS and the 'interactive electorate' are ultimately without value, both for interactivity and the IS itself as they represent the emphasis on rhetoric over practice. Overall, the representation of interactivity in relation to the IS evolves from emphasis on the *Pedagogical* theme, to the *Empowering* effect on communications and finally a *Commercial* perspective in its facility to open up new opportunities for business. Each perspective helps to flesh out the role that interactivity might play in the development of the IS, but the coverage mostly reflects discourse rather than activities. This may explain the lack of coverage of the IS as theme or topic overall in the sample, as noted in the content analysis. Where activities do arise, such as in reporting on e-government projects, the 'level of interactivity' found in IS services reflects poorly on government attitudes to engaging in information exchange with citizens and in facilitating an information society. Ultimately the failure of e-government initiatives and wastage associated with projects tarnishes the image of the *Information Society* and any role that interactivity might play in realising it.

CHAPTER 10
Conclusions

This study has comprehensively addressed the research questions in relation to interactivity. The results of the content analysis reveal not one but a wide variety of meanings and themes of interactivity in the newspaper coverage. The discourse analysis illustrates how newspaper coverage reflects many of the discourses found in the literature review, but also introduces new themes and perspectives which suggest that public discourses have much to offer interactivity research. The analysis also explores how themes operate, both individually and jointly, and highlights where dominant, supporting and conflicting themes as well as overlaps are observed. The study also describes the wide variety of discourse communities and their influence over thematic representations.

Both the content and discourse analysis show that the museum/exhibition context of communication frequently arises in discourses around interactivity and plays a significant part in a number of different thematic representations. This supports the argument that museums should play a greater part in media and communications research and indeed should be regarded themselves as media. Finally, interactivity is shown to operate as a boundary object in a number of respects, whether mediating between private and public communications or online and offline news communications or between discourse communities. Considering interactivity as a boundary object illustrates its potential as a research tool that can reflect upon issues in media and communications studies, especially where its role is shown to be transformative and illuminating in relation to the elements of interactive communication taking place.

10.1 Some observations on thematic relationships and elements of interactivity

There are at least nine themes in the representation of interactivity in public discourses, which arise with varying frequency depending on the genre, topic, context and meanings displayed in articles. However, much like the academic fields informing definitions of interactivity in the literature, these themes are best understood when boundaries between them are removed. This draws attention to the relationships and overlaps which illustrate the particular role each theme plays and how and why some themes dominate over others in particular contexts or come to the fore overall. By comparing the operation of themes with the elements of interactivity common to all modes outlined at the outset – Context, Action, Strategy/Intention, Meaning/Outcome – the various layers that may exist in some representations of interactivity are revealed.

a) Theme partnerships

The *Empowerment* theme is highly effective because it represents the most observable effects of interactivity (physical access, engagement, social/political potential and so on) and operates on various levels in many contexts on its own. But it can also utilise many other themes to multiply its effect or to give a rationale for the empowerment effect. For this reason it is the most common representation of interactivity found in public discourses. For example the *Empowerment* theme is often coupled with a *Pedagogical* theme, when it represents interactivity in allowing both access to and deeper engagement with data, to justify the empowering effect of interactivity in research and education. The layering of these themes indicates a layering of interactivities in the communication process which can be seen where each theme operates on different elements in the process. The *Empowerment* theme states that interactivity empowers by giving participants greater ability to adopt particular *strategies* and take certain *actions* in defined *contexts*. The *Pedagogical* theme adds small aspects of *context* perhaps (in participants and venue) but usually reflects the *outcomes* of the interactive communication, such as learning. The combination makes a powerful argument for the benefits of interactivity, regardless of whether such outcomes are proven (and as noted, evidence actually linking interactivity with pedagogical outcomes is scant).

However, where *Empowerment* works alone it must provide a justification for outcomes by itself. This is observed where interactivity empowers police officers and juries in the prosecution of crime. A supporting theme is not required because of the implication that empowering these groups against crime – and by extension empowering society – is an end in itself. Therefore themes which can represent all four elements (context, action, strategy outcomes) of the interactive communication process by themselves, appear to carry wider discourse potential beyond application in an individual communication event.

Meanwhile in discussions of interactive science museums, the *Pedagogical* theme represents *outcomes, strategies* and *context*, and is presented as the dominant theme. But elements of the *Aesthetic*, *Ludological* and *Hula-hoop* themes arise also in order to enhance the *actions* and *context* of the communication event, as though the *Pedagogical* theme is not appealing enough by itself. Indeed the *Pedagogical* theme relies on *Hula-hoop* to explain the particular appeal of the interactivity of science museums for young people, expressing a de facto association, which almost carries the argument for pedagogical outcomes by itself. However, a *Commercial* theme arises where the outcomes of interactivity are also linked to driving up the number of visitors and students selecting science subjects. The *Information Society* theme then arises, as a minor strategic theme, related less to the elements of interactive communication in a science museum, than to efforts to promote a particular project requiring government support. The combination of *IS, Commercial* and *Pedagogical* themes aligns the museum discourses to government policy discourses, reflecting how discourses around

interactivity are transported interdiscursively between orders of discourse (after Fairclough 2009).

The lack of detailed evidence linking interactivity with *Pedagogical* outcomes in the coverage and in the literature, makes it a useful theme in the service of other themes. It is particularly useful where discourse communities may not wish to draw attention to other outcomes of interactive communication. For example, the *Commercial* theme frequently emerges in relation to strategies and outcomes of communications in discourses around the interactivity of ICTs in the classroom, e-learning software and as noted, in science museums. Even government recognises the value of interactivity for marketing and sales purposes, although will overtly discuss interactivity under the *Pedagogical* or *IS* theme.

The unexpectedly low frequency of the *Information Society* theme relates to the lack of coverage of *IS* related issues. But it is also caused by the weakness of the *IS* theme itself which, although making extensive reference to interactivity in intertextual documents, must rely on the assistance of other *Pedagogical*, *Empowerment* and *Commercial* themes of interactivity to convey the benefits of the IS for users and citizens. Few other themes rely on the *IS* for support and the *IS* theme of interactivity, perhaps reflecting the policy, cannot exist by itself.

b) Theme overlaps

Tensions emerge when themes overlap rather than operating in partnership. The conflicts relate to the relative position of overlapping themes, as dominant, supporting or recessive in the overall representation of interactivity within an article as well as relating to the discourse communities operating.

When *Empowerment* is the dominant theme, it is generally presented in a positive light as benefitting participants and outcomes. But when it arises as a minor subtheme, the empowering aspects of interactivity are presented more negatively such as where it directly contradicts business goals or compromises communication. For example in advertising, which represents interactivity with a *Commercial* theme, the *Empowerment* of users is seen to operate against the marketing message, while in e-commerce the *Empowerment* of commercial interests can interfere with trust in customer relationships. However, the *Futuropia* theme is frequently invoked with the *Commercial* theme to counteract potentially dystopian views of *Empowerment* by introducing utopian potential of interactivity in technological predictions for the future.

Meanwhile in broadcasting, the *Sceptical* theme is enhanced by this negative *Empowerment* of users. Some discourse communities associate this aspect of interactivity with dumbing down communication or interfering with the integrity of the communication event. This

shows how the *Sceptical* theme suggests that excessive *Empowerment* in the context, actions and strategies of communication produces questionable outcomes.

In artistic communication, however, the apparent conflict between the *Empowerment* and *Aesthetic* themes of interactivity is where the artistic challenge and audience appreciation appears to be located. A limited *Empowerment* effect for the audience is designed into the actions and strategies possible in communication with the art/artist, but the context and outcome reflect the *Aesthetic* theme of interactivity. Under the *Ludological* theme, a limited *Empowerment* effect is also designed into the actions and strategies available to users in games and other game-like contexts. But the role of interactivity in games is not clearly understood and while the outcomes might be *Aesthetic* or *Pedagogical,* they are more often left undefined. The lack of clarity over outcomes in game play differs from the lack of evidence for *Pedagogical* outcomes. Pedagogical outcomes are part of the discourse, but are not adequately proven in connection with interactivity. Ludological outcomes are not discussed at all which allows for interactivity to be implicated in a much wider set of negative outcomes such as violence and even murder, long after the communication event.

10.2 Behind the talk: Discourse communities and interactivity

The analysis shows that discourse communities can be participants in interactive communications, spokespersons for participants or designers and producers of interactive events for participants or merely commentators. Thus their strategies in representation are relevant. By identifying and examining the discourse communities operating behind and within the texts, this study has revealed some strategic interests with potentially powerful views over communication contexts and the concept of interactivity itself. It also reveals some overlapping discourse communities which produce some useful 'value contradictions' (after Bizzell, 1992)

One of the more unusual discourse communities in the sample is the police force represented under the *Empowerment* theme. The combination of the assumed discourse neutrality of police officers, the brand power of Apple and the 'technicist' style adopted by the article author means that the representation of interactivity as empowering individuals, systems and society also reinforces those power structures which are represented by the discourse community. The analysis shows this community's construal of interactivity is represented directly and goes unchallenged by the journalist, using a descriptive, procedural and even hortatory style. The intertextual discourses raise significant concerns about the *Empowerment* of interactivity in legal contexts, but these are not available to readers. Even potentially dystopian cinematic metaphors alluding to abuse of power are inverted to support a positive reading of the construal. Ultimately, the power of the law enforcement discourse community is observed when the article is cited in the Dáil, in support of proposals to introduce similar

empowering interactive technologies to the legal context here. This illustrates how even seemingly benign discourses around 'mythical' concepts can have a powerful effect beyond individual communication events, when conveyed by a potent discourse community.

On the other hand, the discourse community of psychologists represented in the *Ludological* theme reflects some of the value contradictions in the coverage which reveal the strategic purpose of discourse. One of the key articles is written by a psychologist, providing an opportunity for a discourse community to speak directly to readers. However, the citations of other psychologists reveal value contradictions in the disagreements within the group over the debate on media effects. There are in fact two separate discourse communities of psychologists, split over research into media effects. But the author's misrepresentation of one group as 'no effects' rather than 'no proven effects', and use of "we" throughout, reveals her discourse strategy. The article argues for restricting access to media for young people, and associating interactivity (an under-researched feature of games) with violence, and invoking the entire community of psychologists, is an effective rhetorical tool. The lack of empirical data on effects and assumptions about the role of interactivity in games, combine to present a 'hypodermic' needle model of media effects. This has long been disproved as an overly simplistic media effects theory (see Berger, 1995). But by misrepresenting the discourse community which challenges her view, the psychologist effectively adds to moral panic by representing interactivity as the 'syringe'. The influence of psychologists over public policy in relation to media use is illustrated by the intertextual analysis and this example shows how misrepresentative discourses, from misrepresented discourse communities, could also have a powerful effect and influence the understanding of interactivity.

Despite the extent of influence of the ICT and media industries as discourse communities, they do not succeed in producing a definitive world view of interactivity. However, this group does dominate the public discourse, through quotations and references, but also through the frequency of topics relevant to their activities and interests. The interactive TV analysis shows how the ICT and media discourse communities attempted to maintain control over the development of the medium, but only succeeded by allowing the representation of interactivity to shift and move from a characteristic of the medium definition to a combination of characteristic, context and application in its cross platform potential. Ultimately this has resulted in a limited version of what once had wider potential. But perhaps this community understood from an early stage that the meaning of interactivity is less important than the potential it holds for revenue generation. The *Commercial* perspective is a powerful representation *because* it is so fluid and is likely to shift again as predictions tested under the *Futuropia* theme come to pass.

Journalists form the largest discourse community in the coverage but also represent other communities through their chameleon-like abilities (after Swales, 1990) and so their

representations are of particular interest. The *Empowerment* theme analysis illustrates the effect of the 'technicist' style of commentary, which is implicated in selling ideas and even ideologies about technology. The boundary is blurred between 'technology in business' journalism and 'commercial features', when this style appears in coverage of IWBs and e-learning software. Technology journalists appear very close to the ICT industry discourse community, even though their communication goals differ. However, some coverage also shows an 'acting out of roles' – placing the journalist closer to role of the 'spy' or 'prospective son-in-law' that Swales (1990:30) describes – joining a discourse community in order to achieve the goal of getting the story. For example, the *Pedagogical* theme shows how a number of different specialties within journalism appear indistinct from other discourse communities – science popularisers, technology companies, market analysts – over representations of interactivity. But the journalist reverts to a news perspective again where value contradictions and a good story arise.

The competition between both sets of museum promoters in the science museum thread illustrates how a discourse community can be split by value contradictions relating to strategies operating outside the discourse. By focusing on the differences between the groups over the meaning of interactivity (*Aesthetic/Pedagogical* vs. *Ludological/Pedagogical*), the analysis was able to show that the perspective which aligned most closely to government discourses succeeded both in winning support and dominating the discourse.

Two further discourse communities, the 'geeks' and 'gurus', form part of the discourse around technology in the coverage although to a lesser extent around interactivity specifically. They were not formally analysed as they were not coded nor was their potential influence over discourses observed until the end of analysis. Gurus represent the technology prediction and production community and geeks are associated with early adopter users/audiences[185]. There is some evidence that journalists use these terms as shorthand for entering into confidences with readers or establishing credentials for the representations depicted within an article. Further research could examine if geeks and gurus are discourse communities or in fact a 'discourse' in themselves. Their frequent appearance in 'technology in business' articles and association with the *Commercial* theme suggests research potential particularly in relation to how they are used in the genre of technology journalism. Comparative research between these discourses and the discourse community of management consultants would also be useful to explore ideas around the increased demands that the digital revolution has made on ICT knowledge (after Bloomfield and Vurdubakis, 2002) and

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[185] The stereotype view of a 'geek' emerged amidst the niche gaming and science fiction fan culture within information technology and computer programming communities at American university campuses in the 1970s, of which Bill Gates is a typical example (Wloszczyna & Oldenburg, 2003 and Peyron, 2009). However, Gates and others of his generation crossed over to 'guru' or 'digerati' status by virtue of their power and influence as 'doers, thinkers and writers' (Brockman, 1996). Other 'digerati' or influential (US) voices in the coverage are Nicholas Negroponte, Al Gore, Larry Ellison and others who were noted as VIPs during the coding process, but not specifically counted.

how technology journalism reports on such knowledge utilising 'geeks' and 'gurus' in this effort.

Public discourse is important because it reflects the meanings circulating in the real world that relate to and emerge from actual use of media and communications technologies. However, this study has also shown that public discourse does not necessarily reflect the discourses of the general public. Their voices and the voices of users and audiences in general are largely missing from the coverage and analysis. Further research needs to address ways in which users and audience discourses around interactivity can be observed and analysed without lapsing back into typologies and definitions that represent their views as merely 'perceptions' of participants in communication events. This research suggests potential for exploring user discourses within more public contexts, such as in museums, as well as the hybrid venues that challenge the boundary between public and private communications. By using a thematic approach, the layering of interactivities that occurs in such communication contexts can then be fully examined.

10.3 Themes and wider discourses

Discourses observed in the literature are clearly seen to be circulating in the public discourses represented by the newspaper sample. These include the association between interactivity and convergence, the labelling power of interactivity and the myth, hype, magic and religious discourses around interactivity among others. The convergence discourse while identified in the literature review is a more significant discourse in the coverage than had been expected. The association of interactivity with convergence emerges early in the sample material, particularly where ICT industry interests are cited in relation to the new developments in technology and business strategy occurring in the 1990s. Interactivity is first represented as related to the convergence of ICT and media businesses, but it is an unknown entity (or UFO according to Gerard Levin of AOL). The subsequent failure of the AOL Time Warner merger – the largest industry convergence ever at the time – could be seen to reflect this lack of understanding of interactivity and its relationship with convergence. Next interactivity was associated with the convergence of platforms or the agreement of technological structures that Bill Gates said would deliver the 'world of interactivity'. However again, the convergence of Microsoft and NBC in an 'interactive news' venture failed because of the lack of agreementover the understanding of interactivity. The TV and computer never converged in the way Microsoft expected and they had expressed a wish to control the interactive 'medium' when interactivity in fact lay in the 'data', which they could not control. Finally, interactivity was indeed identified as emerging from this convergence of platforms in the cross platform potential of data, the 'virtuous circle' described by both Bangemann (1995) and the producers of Big Brother. This reflects further how discourses around interactivity are

transported interdiscursively between the orders of discourse of policy and industry. Discourse communities with different strategies can agree on a representation of interactivity, while those with 'converged' strategies failed to agree on its meaning. Thus interactivity has followed similar fluctuations and instability in its representation as convergence itself (after Pool, 1982). It finally stabilises in the separation of content from container.

Hype is referred to directly in the coverage of interactivity particularly under the *Sceptical* theme as explored in the analysis. The hyping up of interactivity is linked with the dumbing down of communication and the association of a global entertainment business like Disney with the hype over interactivity reflects similar links made by Baudrillard (1997) as noted in the analysis. The 'tabloid' communication style interactivity represents as opposed to the 'broadsheet' of traditional sender/receiver relationships, reflects concerns over changes in communication styles in particular contexts. Indeed discussions around hype arise particularly in relation to specific communication events which do not match expectations. However the transformative potential of interactivity also suggests that there is substance to the hype. Indeed management consultants acknowledge that hype is part of the process of adopting new ideas around technologies, while hype in future predictions is part of the testing process for user acceptance[186]. Public discourse therefore seems to have moved beyond the hype, or at least understands its role in the evolution of discourses around a concept like interactivity better than the discourses observed in the literature review. This illustrates how the analysis of interactivity can reflect back on other concepts like 'hype'. Further research could use interactivity to address the 'hype-cycle' of other new media and communications concepts.

The *Sceptical* theme also links the hype around interactivity to its illusory nature, alluding to discourses around the magical qualities of interactivity noted in the literature review. The illusion created by pre-programmed interactive communications is contrasted with 'true interactivity' which does not need to rely on a magic act for its effect. However the analysis found that this perspective tends to emerge from discourse communities closely associated with the design and production of interactive communications, whether web or broadcast. Although users are underrepresented, the implication in the coverage is that magical illusions of interactivity are not as problematic for users or audience as long as the outcomes of communication are satisfactory. As with hype, magical discourses may be a phase in the evolution of discourses around problematic concepts or technologies and again further research would assist in this regard.

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[186] This was examined under the *Futuropia* theme but is also enshrined in business processes such as Gartner's annual 'hype-cycle' reports, which assess the maturity of technologies and trends "from the Peak of Inflated Expectations, to the Trough of Disillusionment, then the Slope of Enlightenment, and finally to the Plateau of Productivity". See http://www.gartner.com/technology/research/hype-cycles/ [accessed October 16, 2011].

Religious discourses are reflected in several references to belief in interactivity, although are not as frequent as expected. Belief is challenged by hype and the sceptical perspective in general. Hype presents a dilemma in that one can either believe the hype and receive a misrepresentation of interactivity or reject the hype and possibly some of the substance behind it. Belief in interactivity itself however, is as much a business strategy as an expression of spiritual credence. Much like the discourses on magic, those most sceptical are associated with the design community and lack of faith results from the failed outcomes of specific communication events. However, general belief in the 'world of interactivity' is strongly associated with US industry representatives and Microsoft in particular, where the expression of belief conveys both the knowledge to hand and strategic hopes for future. Whether there is a more spiritual level to belief in interactivity is a subject for future research. Finally, the addition of a new configuration of 'title' during the coding process, to cater for the number of configurations in the coverage which were merely labelled 'interactive' without any futher detail, illustrates how the labelling power of interactivity carries through into public discourse. IWBs and interactive TV were coded with their own configuration but companies, buildings, conferences and the many other entities that include the term in their title without further detail, required another configuration. The interactive label has the effect of transforming the entity in some manner and yet nullifying further discourse. Indeed, if *Hula-hoop* interactivity is "like y'know for kids", then these labels say that the configuration is 'like y'know, interactive'. However, the lack of definition is useful in allowing for a wide variety of associations which may suit business objectives. It also allows traditional media companies to experiment with the changing media paradigm in spin off departments and companies which retain the parent brand. The benefits flow both ways as the new entity has brand recognition while old media gets a rub of the new.

10.4 Interactivity as boundary object

The literature review explored some binary views or dichotomies arising from interactivity research such as its procedural/participatory aspects (Murray, 1991), immersive/extractive strategies (Lunenfeld, 1993) and open/closed styles (Ryan, 2001). The analysis has shown that rather than splitting interactivity into the binary types, or viewing it as belonging to one or other side, interactivity should instead be used as the boundary object to draw dichotomies, binaries and other conflicting positions together. Its fluidity of meaning and representation is beneficial in the assessment of the boundaries between binary pairs whether public and private, online and offline, sender and receiver or other issues that arise in coverage. Under the *Commercial* theme, interactivity plays a role as a boundary object between the public and private communication space. Advertising communities acknowledge the importance of privacy of mobile phone communications, but are also attracted to *Futuropia*

representations of interactive advertising which increasingly encroach on consumers' private and cognitive space. The analysis shows that interactivity can play an important role in negotiating this boundary by exploring the agreement or otherwise between participants and discourse communities over its role in advertising. Similar issues arise within the ICT industry which displays an awareness of the role of interactivity in exploring the boundary between public and private information, between the depictions of interactivity as UFO or Trojan horse. But user voices are missing from the coverage, a perspective, which is required for clarity on who manages this boundary or controls the interactivity.

The content analysis showed that it is increasingly difficult to distinguish between public and private communications in terms of venue and this was an aspect of the study where the quantitative findings were insufficiently detailed for coherent qualitative analysis. However, it represents an opportunity for further research into how game playing among groups in friends' houses, social networking while commuting and mobile phone use in museums could or should be defined and the role that interactivity might play.

Interactivity also acts as a boundary object for media practitioners, reflecting the shifting divisions and relationships between senders, messages and receivers. The *Empowerment* analysis shows how interactivity explores the line between online news, newspaper coverage of online news, and a newspaper's own online news coverage of one event. Interactivity draws together both online and offline journalists, publishers and users in the goal of understanding the new media paradigm as well as its own role within it. It highlights the differences between the old and new paradigms but also acknowledges how offline values can be brought into the online news environment, such as the value of time, space and distance in news production. A similar effect is seen in the *Sceptical* theme analysis of interactivity in broadcasting, where media practitioners are forced to assess their own roles in production and the integrity of communications since the 'arrival' of interactivity. The exploration of its meaning, while creating heated debate, has forced practitioners to address expectations and agree on guidelines for interactivity.

Interactivity also acts as boundary object in highlighting the shared strategic goals of diverse discourse communities in the development of an interactive science museum while also revealing the diverse meanings and themes arising from a single discourse community, with an assumed shared goal. It is also a boundary object for exploring how representations of the future assess the appetite for fantasy and fictional technologies while also testing acceptance of the current state of the art. Further, interactivity may act as a boundary object even where boundaries are being removed in future such as in ubiquitous computing. Examining the context, action, strategy and outcomes of interactivity may soon be one of the few ways of assessing what is actually happening in a communication event. Many more examples from the public discourse suggest that this is a rich seam for research where interactivity can be

used as a tool to explore representations of and strategies in communication, while also benefitting from further elucidation of its own meaning and role in many different communication contexts.

However the boundary object also presented some issues for this thesis. The multidisciplinary nature of interactivity and the scale and diversity of material generated for discourse analysis meant that inevitably, some rich seams had to be excised for reasons of space. This included an analysis under the *Aesthetic* theme of the use of icons in interface design which suggests that interactivity have moved from generic and open icons (e.g. the shopping trolley icon) to specific and closed symbols (social networking brands) and thus from public to private uses and benefits. The *Commercial* theme also included analysis of the development of interactive TV in Ireland. These and further analyses suggest there are many perspectives yet to be revealed in the public discourses on interactivity.

Finally, the analysis of intertextual references within articles raised a number of issues and required the investigation of some stories that brought the boundary object nature of interactivity into sharp relief. For example, the murder case cited under the *Empowerment* theme, required an extensive search of legal, academic and press material but also resulted in accidental stumblings onto more private communications found online. At one stage, the process of trying to distil the details into a node that could reflect somehow on the concept of interactivity seemed not only irrelevant but possibly tasteless in terms of the magnitude of the event itself. A similar sensation occurred with the analysis of the coverage of the attacks of September 11, 2001 with the additional concern that the ubiquity of this event in discourse, indeed its potential for connection to all discourses, would render its use here somehow cosmetic or forced.

However, on reflection, the inclusion of both events – and the many other stories and links which built the discourse structure in this study – serve a crucial purpose for this research. While these were radically different events, they were similar in that they had an impact far beyond the event itself and the people directly affected by it. Indeed the effects of both are still being processed and understood and in this way, the representation of interactivity associated with them highlights why it needs to be better understood. They help to illustrate why the concept is important and to counteract the effects of the 'myth', 'hype', 'magic' and sceptical discourses in the literature which I would argue have devalued and limited the research potential of interactivity. These devaluing discourses have of course emerged perhaps because of the relatively banal or commercial communication events and contexts which have generally formed the context of interactivity research. Notwithstanding the importance of news journalism and civic participation forums, the majority of the interactive communications referred to in the literature on interactivity, or used methodologically, do not tend to transmit the important or transformative political role of the concept in *themselves*.

Neither do they lend themselves to describing the transformative emotional communication potential that has emerged in this analysis. If the coverage only delivered material which related to habits on bulletin boards, or new calculators on bank websites, it would have suggested that the concept can finally be put to bed, as descriptive but not particularly insightful in terms of media and communications. But the intertextual analysis has proven that interactivity is both a valuable concept and essential tool in media and communications research.

10.5 Concluding remarks

There is more than one understanding of interactivity and the role it plays in communication. This thesis has highlighted the futility in attempts to find one single bounded definition of a concept which has so many more valuable meanings circulating around it and which change according to the discourse communities and the communication context involved. Indeed the focus in the literature on finding a single definition (and establishing the boundaries within which it applies) has obscured the analytical potential of interactivity. This study reveals its power as a tool because of the role it plays in drawing attention to the strategies, outcomes, meanings and actions taking place in communication.

However, at the outset of this study it was expected that the different understandings of interactivity found might be context and/or discourse community *dependent* and relatively isolated from each other. A variety of different meanings that exist would be equally problematic if there were no coherence between them. However, the process of distilling the discourses and finding at least nine themes has led me to a more integrated view of the meanings circulating. They appear as different layers or aspects of the potential of interactivity, rather than different definitions of it and do not preclude the possibility of further themes arising from other contexts and discourse communities in future. Rather than complicating its operation, (which is the way different meanings have been viewed previously) these competing themes enhance its value as a concept and point to a variety of ways it effects communication. For example, a pedagogical view of interactivity may differ extensively from an aesthetic view, in terms of the action or context involved, but both can combine powerfully to achieve a commercial or empowering outcome. This and the many other overlaps observed between themes and the elements of interactive communications point to its value and the many directions in which future research on the concept could focus. So construals of interactivity emerge from individual themes but also from the interplay between them. Moreover, larger discourses concerning the hype, myth, magic and spiritual nature of interactivity, which circulate within and across these themes, are frequently challenged and even overtaken by the transformative nature of some representations of interactivity. Public discourse has highlighted the *strategic* value of interactivity in

communications, which has been neglected in research to date. And frequently it is only in the use of interactive communications that transformative effects and strategic benefits have been observed and discussed, both by participants in and producers of communication events. Discourse analysis uniquely provides the possibility for exploring such a wide variety of viewpoints relating to so many different contexts of communication.

This study has illustrated a small country perspective on a communications concept that has seldom previously been examined from a bounded or national perspective. Yet while often rooted in local contexts and experiences of interactive communications, the Irish public discourse on interactivity examined in the sample reflects the influence of discourse flows into Ireland from other large English-speaking countries, noted particularly in the syndicated international coverage of discourse communities from the ICT industry, media and other fields. Indeed Ireland's 'semi-peripheral' position in relation to influential trade and media neighbours in the USA, UK and the EU and gives public discourse here a unique flavour that makes a particular contribution to communications research in general (see Barry, 2012). Further research could examine patterns in the flow of public discourse on media concepts like interactivity internationally and explore comparative data from public discourse in other countries. Of particular interest would be the identification and analysis of discourse communities whose influence transcends borders, much as discourse does itself. Thus the concept of interactivity as boundary object could take on a more literal meaning and application as a comparative research tool.

The analysis of themes, discourses and communities has produced some significant results in relation to the meaning of interactivity. But it also reveals an important role for interactivity as a reflexive tool in media and communications studies, bringing dichotomies together and turning the mirror back towards the elements of communication events in which it plays a part. Discourse communities consciously or unconsciously reflect themes and discourses in discussion, thereby contributing to the construal of interactivity in public discourse. The power of certain discourse communities, combined with the potency of particular themes, (especially those that represent all elements within interactive communications), transforms the discourse. It extends the reach of such representations of interactivity beyond single communication events and articles reporting on them, indeed beyond borders, to wider application describing a value or quality of communications dominant in society.

Taken as a whole, I believe this analysis illustrates a particular historic period in communications, an age of interactivity, from a point where it is finally not just possible but increasingly pertinent to conduct analysis into digital communication concepts from an historical perspective. A history of interactivity suggests the further possibility of a history of new media, which allows for developing important distinctions between 'old-new' and 'new-new' concepts and technologies for further deliberation. An historic shift also looms on the

methodological front where the application of content and discourse analysis to printed newspaper content, of which this study may be among the last, will inevitably have more limited application in future research design. Until now, such techniques have yielded significant results and rich material for analysis but will be challenged in the less constituted arena of public discourse in socially networked communication. This history of relatively fixed discourses on interactivity gives way to a more fluid future structure of discourse, where perhaps a broader understanding of interactivity may be a useful tool in itself.

The age of interactivity may have been in existence for a long time, as the literature from the many disciplinary fields informing this thesis suggests. But this study illustrates that in many ways, and especially in terms of its value as a research concept and tool, the age of interactivity has only just begun.

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APPENDIX A

Content Analysis source material:

- The *Irish Times* newspaper articles, which formed the data for the content analysis sample, were sourced using LexisNexis. Individual articles for discourse analysis are cited throughout this thesis.
- All are available online at NexisUK - http://www.lexisnexis.com/uk/nexis/
- All were accessed between March 1, 2010 and October 30, 2010
- All other newspaper articles cited include the URL in footnotes and access details where appropriate

Coding Notes:

General coding details are given in the Methodology chapter and in the Codebook, further in the Appendix. Some additional notes are as follows:

*Genre Note: Over the sample period, the *Irish Times* appears to be gradually segregating content into genre types. New genres such as 'Education', 'Media' and 'Property' appear as separate newspaper supplements so have been added to the codebook to reflect the latter years of the sample. During coding, take care to differentiate between genre and supplements. Many newspaper supplements are in fact the same style of writing and reporting as other genres e.g. news or lifestyle features. Supplements merely focus on specific topics such as 'Health', 'Travel' and so on and should be coded under the appropriate genre. Extra options can be added to the standard list of Genres if more than ten articles of a particular genre emerged in the coverage. Other genres with fewer than ten articles are collectively coded under 'Other'.

*Relevance note: Central relevance is measured by the appearance of the term in the headline, standfirst or lead paragraph along with multiple references throughout the article as part of the main topic or thrust of the content, and some discussion around its qualities or contribution to other issues in the article. Incidental relevance is measured where the term is used once in an adjectival or nominal sense, with little further discussion, and is irrelevant to the main content of the article. Peripheral relevance is measured where the reference was somewhere on the spectrum between the two.

*Domain note: Some communication contexts may relate to several domains, for example television could represent the entertainment or news domain. In such cases, the domain explicitly noted in the coverage is the one used for coding or, if not overtly stated, the purpose assumed to be associated is used. If the reference was unclear or uncodable, the article was coded as such as with all other variables.

CODEBOOK FOR CONTENT ANALYSIS

No.	VARIABLE	VALUES
01	**Unit Code**	Numbered…
02	**Date**	dd/mm/yyyy
03	**Genre*** **(as noted by LN)**	1. News Report 2. News Feature 3. Editorial, Leading Article 4. Opinion/Analysis 5. Business 6. Sport 7. Arts/Culture/Entertainment/Media 8. Review – Music, cinema, TV, games etc. 9. Lifestyle Features 10. Technology/Computers 11. Letters to the Editor 12. Education 13. Weekend supplement 14. Media 15. Property 16. Other
04	**Unit Word Count range** **(body text)**	1. (1- 200) 2. (201-500) 3. (501-1000) 4. (1001-1500) 5. (1501-2000) 6. (2001 +)

05	**Author**	1. No byline
		
		2. News Journalist
		      2.1 Staff/Freelance/Stringer (often undistinguished)
		      2.2 Syndicated (UK)
		      2.3 Syndicated (US)
		
		3. Agency
		
		4. Opinion/Analysis/Review/Features writer
		      4.1 Staff/Freelance/Stringer (often undistinguished)
		      4.2 Regular columnist
		      4.3 Politician (Government)
		      4.4 Politician (Opposition/other)
		      4.5 Guest (details included
		      4.6 Guest with IT affiliation
		      4.7 Guest with Media/Culture affiliation
		      4.8 Academic
		5. Letter Writer
		6. Other (specify)

06	**Gender of author**	1. Female 2. Male 3. N/a or Agency (!)
07	**Frequency**	Number #
08	**Relevance***	1. Central – article about interactivity or being interactive 2. Peripheral – passing mention in story on relevant topic (tech, media etc.) 3. Incidental – passing mention in story about something else

09	**Topic(s)**	1. Internet
		    1.1. Internet use – developments
		    1.2. Internet access – broadband
		
		2. IT & society
		    2.1. General overview – use, progress, new developments
		    2.2. 'Convergence', 'web 2.0' – The 'shape of things to come'
		    2.3. Criminal Legal – Security, Virus, Hacking
		    2.4. Civil Legal – IP/Copyright/ competition etc.
		
		3. IT industry

		3.1. Hardware/software/gadget/app releases
		3.2. Business: investments, ventures, M&As, P&Ls, employment, closures etc.
		3.3. Conferences/seminars
		
		4. Media & Communications Delivery – industry
		Telephony/ Mobile comms/TV Broadcast / satellite / digital / cable/ ISP / WWW services
		[this topic converged from 1998 onwards!]
		
		5. Media & Communications Production – industry
		  5.1. TV/Radio
		  5.2. Film/Video/DVD
		  5.3. Music
		  5.4. News publishing/journalism
		  5.5. Advertising/marketing
		  5.6. Games
		  5.7. Internet entities – search engines, social media platforms
		  5.8. 'Multimedia' software or app
		  5.9. Other
		
		6. Media & Communications content – new releases/developments/reviews
		  6.1. WWW – websites, browsers, add-ons
		  6.2. CD/DVD games
		  6.3. Console, platform games
		  6.4. CD/DVD reference (books, music, encyclopaedia etc.)
		  6.5. Databases, collections
		  6.6. Other (specifiy)
		
		7. Arts / Culture / Entertainment content review/interview
		  7.1. Music
		  7.2. Film/TV/Radio
		  7.3. Exhibited art/fine art
		  7.4. Books/Literature
		  7.5. Performance/Theatre/spectacle
		
		8. Public policy
		  8.1. Telecoms/internet/broadcasting
		  8.2. Information society/KS/SE
		  8.3. Copyright/intellectual property
		  8.4. Arts culture
		  8.5. E-government
		  8.6. Other
		
		9. Museums/ Heritage / Science centres / exhibitions
		10. Academics/Research
		11. Tourism
		12. Architecture/Construction/Property Development
		13. Education/Training
		14. Science
		15. Domestic Politics
		16. International Relations (EU, UN, G7/G20, Other)
		17. Private Sector Business (not IT, media, telecoms etc)
		18. Human Interest
		19. Other – specify
		20. Legal issues
		21. Health – lifestyle
		22. Sports – events, competitions
		23. Public safety, public service information

10	**Location (geographic) - of topic**	1. Ireland 2. US 3. UK 4. Northern Ireland 5. EU 6. Other

			7. Fictional place - anytime
			8. The Future - Real/Fictional place
			9. Virtual / cyber (physical context described as such)
			10. Not specified
			FROM THIS POINT ON CODE RE: INTERACTIVE REF
11	**Domain*** **(communication type) -** **of 'interactive' reference**	1. Communications – Internet, telecoms, publishing etc. 2. Education & Training 3. Reference 4. Entertainment – live, broadcast, analogue, digital 5. News – online, digital, cable etc 6. Music 7. Arts/Culture 8. History/Heritage/Tourism 9. Business, Commercial Services; E-commerce, Shopping, 10. Advertising / Marketing 11. Tour, Virtual travel or Space/location/interior 12. Government, official, public sector 13. Discourse - theoretical reference 14. Research projects 15. Other – specify	
12	**Venue** **(specific physical place) -** **of actual/potential** **'interactive' reference**	1. Home 2. School/University/Educational location 3. Workplace 4. Museum/Gallery/Exhibition space 5. Public space (other) 6. Private space (other) 7. Undefined location Web/Online 8. Other – specify 9. Undefined location Music/Game play – potentially mobile 10. Not possible to specify	
13	**Associated** **instance/example:**	1. Specific 2. Generic	
14	**Configuration** **(physical set up)** **of the 'interactive' thing** **or experience -** **hardware/software etc.**	1. Interweb – Desktop/laptop - www, email etc. 2. Terminal - Touchscreen/Kiosk/whiteboard - screen 3. CD-Rom/ DVD 4. Online game (www) 5. Platform/Console game/media (Xbox, Playstation) 6. Face to Face – social interaction 7. E-learning/Training application/software 8. Other internet application 9. Generic Desktop/Laptop computer use (inc. app and software) 10. iPhone/ Phone/Smart phone Application 11. VR/Haptic/Sensor device 12. Theatrical/Performance - physical 13. Futuristic fictional technology 14. Telephony/VOIP/Conferencing 15. TV/ Interactive TV/Film/Cinema 16. Network / Database 17. Exhibit(s)/Display/Installation (unspecified config) 18. Other (specify) 19. Title - Company/Conference/Course name or description 20. Building / Defined space 21. Online Advertisement/ interactive marketing 22. Multimedia – I Multimedia 23. Map/Guide 24. Unspecified generic description – I…services, products, activities, media etc.	
15	**Sphere of communication**	1. **Interactivity with a *Machine*** **(e.g. Human Computer Interaction)** 2. **Interactivity with *Others*** **(e.g. Computer Mediated Communication)** 3. **Interactivity with *Data/Content/Information*** **(e.g. Hypertext, Interactive Narrative, Film, CD-Rom ref etc)** 4. **Interactivity with a *System*** **(e.g. Internet, interactive Television, public service, world)** 5. **Interactivity within or of a *Space* – virtual experience,** **environment**	

		6. **Interactivity with *Money* - Shopping/Banking**
		7. **Other**
		8. **Interactivity with *Objects* – handling or touching something**
16	**Definition -** **implied or overt meaning**	1. "**Characteristic** of the medium" - in use or under discussion , differentiates old media from new media 2. "**Perception** of the user" - a sensation relating to the experience 3. "**Context** of communication" – i.e. in the name/expected 4. "**Application** of profession/skill in design/communication" – 'Interactive designers' – industry led definition (leads to framing perhaps) 5. Other
17	**Theme**	1. **Empowering** – ideological, empowering 2. **Pedagogical** – enhancing learning experiences 3. **Ludological** – enhancing play, entertainment 4. **Information Society** – indicative of 5. **Futuropia** - New Media - Futuristic tropes 6. **Sceptical** – sceptical, negative non-enhancing 7. **Hula Hoop** – like y'know for kids, but undefined 8. **Aesthetic** – enhancing sensation 9. **Commercial** – enhancing revenues, brands 10. **Other/none**
18	**"Quotation marks"** **i.e. "interactive"**	1. Yes 2. No
19	**VIP** **– Icon, artist celebrity business geek, guru type i.e. regularly cited and rarely introduced or described i.e. reputation precedes…** *(This variable is for notes only, not counted statistically)*	1. Bill Gates 2. Nicholas Negroponte 3. Larry Ellison 4. Steve Jobs 5. William Gibson 6. Marshall McLuhan 7. Ted Nelson 8. Al Gore 9. Martin Bangemann 10. MIT/Medialab 11. Other (Jakob Nielsen)
20	**Responsibility for reference to interactive/interactivity is with…**	1. Author/Journalist/reporter 2. Quoted person 3. Cited document 4. VIP attribution 5. Company/Body – name 6. Company/body – PR (says, asserts, proposes, suggests etc) 7. Other
21	**Term appears in headline/standfirst**	1. no 2. yes

20	**Quotes:**
	a) Citations – documents inc. websites quoted/referenced
		1. Government/Public Policy doc
		1.1 Ireland
		1.2 US
		1.3 UK
		1.4 EU body
		1.5 EU country
		1.6 Other
		
		3. NGO
		   3.1. Ireland
		   3.2. US
		   3.3. UK
		   3.4. EU
		   3.5. Other
		
		4. Academic/Research
		   4.1. Ireland
		   4.2. US
		   4.3. UK
		   4.4. EU
		   4.5. Other
		
		5. Private Sector/Business, Creative

		5.1. Ireland 5.2. US 5.3. UK 5.4. EU 5.5. Other 6. Public Sector/Arts, Heritage 6.1. Ireland 6.2. US 6.3. UK 6.4. EU 6.5. Other 7. Media (Press, TV etc) 7.1. Ireland 7.2. US 7.3. UK 7.4. EU 7.5. Other 8. Books/fiction or popular literature 9. Artists – work/web/catalogue etc. 10. Other

21	**Quotes:**
	b) Assertions – people or organisations wquoted/referenced
		1. Government Rep
		  1 Ireland
		  2 US
		  3 UK
		  4 EU country
		  5 Other
		
		2. Other political Rep
		2.1. Ireland
		2.2. US
		2.3. UK
		2.4. EU
		2.5. Other
		
		3. Other public authority
		3.1. Ireland
		3.2. US
		3.3. UK
		3.4. EU
		3.5. Other
		
		4. NGO body / Lobby group
		4.1. Ireland
		4.2. US
		4.3. UK
		4.4. EU
		4.5. Other
		
		5. IT/Computing/Internet/www – industry
		5.1. Hardware/Software
		5.2. www network publishers (social search)
		
		6. Media & Comms delivery - industry
		[Telecom, Cable, Satellite, Digital - converged]
		7.1 Ireland
		7.2 US
		7.3 UK
		7.4 EU
		7.5 Other
		
		7. Media & Communication content – industry

		7.1. Entertainment – tv, radio, film,
		7.2. News
		7.3. Advertising
		7.4. www/ multimedia /digital production
		7.5. Publishing/E-Learning/Reference
		7.6. Games
		7.7. Other

8. Journalist/Reporter - News Media/Magazines/Journals
   8.1. Ireland
   8.2. US
   8.3. UK
   8.4. EU
   8.5. Other

9. Individual artist
   9.1. Musician
   9.2. Visual Artist
   9.3. Photographer
   9.4. Film maker/actor
   9.5. Theatre practitioner/Actor
   9.6. Multimedia artist
   9.7. Architect/Designer
   9.8. Other

10. Institutional rep - Artistic director, curator etc.
    10.1. Ireland
    10.2. US
    10.3. UK
    10.4. EU
    10.5. Other

11. Writer/Author
    11.1. Ireland
    11.2. US
    11.3. UK
    11.4. EU
    11.5. Other

12. Teacher/Academic/ Research/Scientist
    12.1. Ireland
    12.2. US
    12.3. UK
    12.4. EU
    12.5. Other

13. Member of public
    13.1. Ireland
    13.2. US
    13.3. UK
    13.4. EU
    13.5. Other

14. 'User' of application
    14.1. Ireland
    14.2. US
    14.3. UK
    14.4. EU
    14.5. Other

15. "Analysts", 'Industry observers', Sources –
    15.1. Named
    15.2. Anonymous

16. Other commercial business
    16.1. Finance/Banking/Insurance
    16.2. Retail/Shopping

		16.3. Management Consulting
		16.4. Marketing/Advertising/PR
		16.5. Other
		
		17. Construction industry/Property developer/company rep
		    17.1. Ireland
		    17.2. US
		    17.3. UK
		    17.4. EU
		    17.5. Other
		
		18. Student
		    18.1. Ireland
		    18.2. US
		    18.3. UK
		    18.4. EU
		    18.5. Other
		
		20. Other (non business) - specify

22	**Gender of quoted**	1. Female 2. Male 3. unknown/neither/both

APPENDIX B

Discourse Analysis selection process

The articles selected for discourse analysis were identified during a multistage process of developing a 'discourse map' of the themes and linkages across the entire data for the sample period. This process was conducted manually with print copies of each of the articles in the data sample and involved four key stages:

Stage 1

Collating and sorting all articles according to themes coded, eliminating weak and/or repetitive material according to results for quantitative coding variables and generating groups of material along subtheme and story threads

Stage 2

Visually mapping ideas and topics from data across themes and noting thematic connections, overlaps and relationships to highlight articles to focus on that represent both breadth and depth of data sample (see Discourse Map illustration p.270)

Stage 3

Creating selected groups of articles for analysis under each theme according to map, balancing spread of articles across sample period and reflecting quantitative results

Stage 4

Conducting discourse analysis on all material selected for each theme and reducing final analysis to the strongest most representative material that describes the various facets of each theme while adequately reflecting the quantitative findings (see Timeline of articles selected for discourse analysis pp 271-273 and Illustration of timeline p.274)

DISCOURSE MAP

PLAY

HULA HOOP

Venues / attractions

CRITICAL PEDAGOGY

DIGITAL GAMES

SCIENCE IN SOCIETY

CONSTRUCTIVISM

Theatre

LUDOLOGICAL

Interactive Whiteboards

PEDAGOGICAL

GAMES THEORY

Hypertext

MUSEUMS

Information / News

Narrative

Design

Exhibits

e-learning

DEMOCRACY

AESTHETIC

Creativity

Touch

Access

EMPOWERMENT

Access

Control

IMMERSION

MYTH vs BELIEF

CHARACTERISTIC vs APPLICATION/PERCEPTION

RELATIONAL AESTHETICS

TECHNOLOGICAL DETERMINISM

SKEPTICAL

INTERACTIVITY

Cloud computing

NEW MEDIA THEORY

PERCEPTION vs. BELIEF

SPACE / TIME

Web 2.0

FUTUROPIA

COMMERCIAL

Web 2.0

Disney?

Ubiquitous computing

Hype

INFORMATION SOCIETY (ISKSSE)

Artificial Intelligence

Cost/ Benefit

INTERACTIVE TELEVISION

PUBLIC SPHERE

VIP /LIFESTYLE DISCOURSES

ENGAGEMENT / PARTICIPATION

Serious games

PERSONALISATION

Sports / Technological advances

MIT

ADS/MARKETING

Silicon Valley

Bill Gates

Consumer Society

DIGITAL DIVIDE/ACCESS

Nicholas Negroponte

DOT COM BOOM/BUST

MediaLab

Digital Hub

2

Timeline of articles used in final discourse analysis

1995
"Alive and kicking" by Helen Meany, *Irish Times,* January 6, 1995
[FUTUROPIA]
"G7 announces on line projects" by Michael Cunningham, February 27, 1995, *Irish Times*
[INFORMATION SOCIETY]
"The return of the King" by Frank McDonald, *Irish Times,* July 15, 1995
[SCEPTICAL]
"Scientific knowledge essential for society", by Dr William Reville, *Irish Times,* August 14, 1995
[PEDAGOGICAL]
"Disney's Indian Gift" by Penelope Dening, *Irish Times,* August 26, 1995
[SCEPTICAL]
"Saddle up the mouse for a trip on the superhighway" by Frank O'Mahony, *Irish Times,* September 15, 1995
[COMMERCIAL]
"Microsoft, NBC to link up" by Reuters, *Irish Times*, December 12, 1995
[FUTUROPIA]

1996
"CBT profits up 217%" *Irish Times,* April 1, 1996
[PEDAGOGICAL]
"The state we're in" by Michael Cunningham, *Irish Times,* May 27, 1996
[INFORMATION SOCIETY]
"An Irishman's Diary" by Mary Mulvihill, *Irish Times,* June 17, 1996
[PEDAGOGICAL]

1997
"Docklands scheme would be largest ever" by Frank McDonald, *Irish Times,* May 31, 1997
[PEDAGOGICAL]
"CBT systems in strong market position", *Irish Times,* August 11, 1997
[PEDAGOGICAL]
"How soon is now?" by Karlin Lillington, *Irish Times,* September 22, 1997
[INFORMATION SOCIETY]
"Check Up", by Lorna Kernan, *Irish Times,* November 7, 1997
["HULA HOOP"]
"Blade Runner", Review, *Irish Times,* December 13, 1997
[LUDOLOGICAL]
"'Cable companies getting into Internet services market" by Eoin Licken, *Irish Times,* December 19, 1997
[COMMERCIAL]
"The year of the chat" by Michael Cunningham, *Irish Times,* December 29, 1997
[FUTUROPIA]

1998
"Dutch provocateur" by Hugh Linehan, *Irish Times,* January 3, 1998
[FUTUROPIA]
"Tubes, chambers, pipes and arteries" by Luke Clancy, *Irish Times*, March 26, 1998
[AESTHETIC]
"The eyes have it" by Michael Cunningham, *Irish Times*, April 20, 1998
[AESTHETIC]
"Murdoch and Gates go head-to-head on TV" by Eoin Licken, *Irish Times,* April 10, 1998
[COMMERCIAL]
"Textbites", *Irish Times* June 15 1998
[COMMERCIAL]
'Portrait of the Artist as Webmaster' by Karlin Lillington, *Irish Times* June 16, 1998
[AESTHETIC]
"Riverdeep aims for Nasdaq listing" by Sean MacCarthaigh, July 27, 1998
[PEDAGOGICAL]
"Potential of Virtual Reality about to be unleashed" – *Irish Times,* September 25th, 1998
[EMPOWERMENT]
"Big retailers are watching you" by the Financial Times Service, *Irish Times,* November 13, 1998
[COMMERCIAL]

1999
"Final quarter profits in nosedive at CBT" *Irish Times,* January 20, 1999
[PEDAGOGICAL]

"Oppressed for a day" by Veronique Mistaien, *Irish Times,* April 17, 1999
[AESTHETIC]
"A town logs on to the information age" by Gordon Deegan, *Irish Times,* September 24, 1999
[INFORMATION SOCIETY]
 "CBT shares lose $510m as investors reject new strategy" – by Siobhan Creaton and Bill Murdoch, *Irish Times,* October 20, 1999
[PEDAGOGICAL]
"Why games are going Hollywood" by Antony McKiver, *Irish Times*, November 10, 1999
[LUDOLOGICAL]

2000
"The fight over football", by Harry Browne, *Irish Times*, February 2, 2000
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