

Electronic agents and intellectual property law¹

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1. Introduction: Electronic agents

In this paper, the notion of electronic agents will not be discussed. It is presumed that the reader is somewhat familiar to electronic agents, and how they may operate. The paper will focus on the type of agents known as “autonomous”, and will not discuss to which extent such a characterisation is misleading. Neither will be discussed the term “agent”, but it may be necessary to state that the electronic “agent” is *not* an agent according to the law of agency, it is not some intermediary between a principal and a third party. The legal nature of an agent in respect to autonomy and the law of agency are in itself interesting, but this paper will not discuss these aspects.²

The situation presumed in this paper, is that an agent is developed by a software house, which will offer the agent to users. There will be a contractual relationship between the software house and the user, and the user will in this paper be termed the “principal”, though this term is – as stated above – somewhat misleading in legal terms.

The principal will employ the agent in electronic commerce. This presumes that the agent may negotiate contracts, typically with agents representing other principals. It is presumed that the reader is sufficiently familiar with the way autonomous agents operate that an introduction of this will be excluded.

In a legal perspective, agents are of interest as the technology makes it necessary to re-examine some of the basic legal concepts and principles. Many hold that agent technology will become one of the platforms for future electronic trade, and that “electronic commerce” as known today only is a first step towards the real electronic marketplaces. Intellectual property is of special interest, as what is the subject for trade can be communicated through the same network in which the agents operate. In future, if you want to screen a movie, you may specify the title etc of the movie to your household agent, and the movie will nearly instantly be available – the agent has on your behalf negotiated a favourable price relative to the licensing conditions (for

instance performing of the movie one time, no storage). This only to indicate that there may be several reasons for taking an interest in electronic agents in the perspective of intellectual property law, they will – as indicated – probably be integrated in the future digital rights management systems.

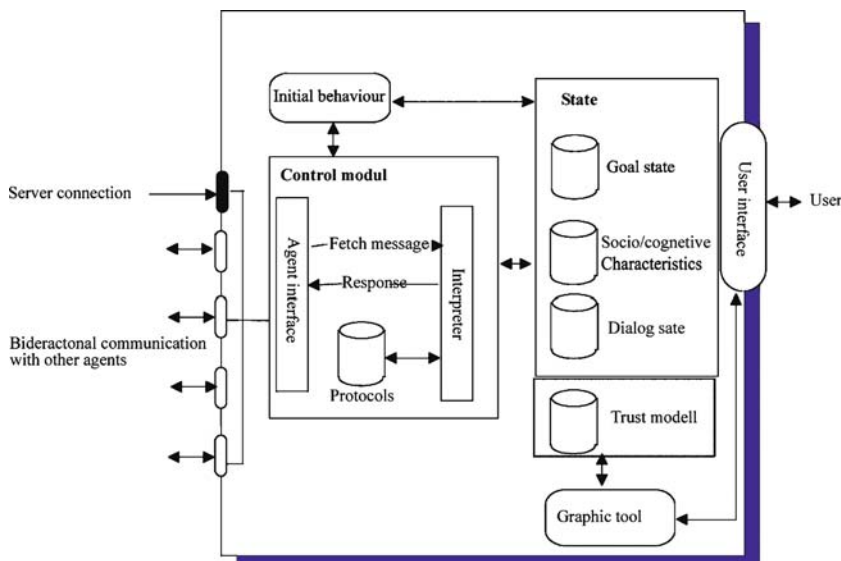
2. What is an electronic agent in legal terms?

The introductory presentation of electronic agents only gives an indication of what they are, and how they work. There are several generic descriptions of electronic agents. In this context, details are not critical, but it might be useful to represent the components and functions typically included in an electronic agent.³

To the right is indicated a graphical user interface. The principal will specify a goal state, for instance which type of goods he or she wants to purchase. The agent has a programme determining the first choice, with which the agent starts. The agent sends and receives messages based on certain protocols, and which are interpreted. Throughout, the agents consult with the internally stored data specifying the state, and which is updated based on the messages.

This somewhat complex structure reveals that the agent is constructed of three types of elements relevant for a legal discussion.

First, there are computer programmes. A computer programme will, according to copyright law,⁴ typically be a sub-category of literary works.



There may be cases where the programme of an agent does not satisfy the test of originality to qualify as a copyrighted work; this will have to be decided according to the usual criteria. According to the European Patent Convention, computer programmes as such do not qualify as inventions, but in practice programmes are generally considered not to be only programmes “as such”, and may therefore be patented.

Second, the agent contains tables, *databases*, etc. This may be data specifying the “mission” of the agent, data relating to the principal (location, turn-over, line of business, etc), and data referring to or containing electronic signatures and associated certificates and so on. In principle, these may be sufficiently original configuration of data to qualify as copyrighted works, but it is suggested that this would be exceptional. More often, the data may satisfy the criterion of investment necessary to qualify for the *sui generis* protection as databases available under the European database directive.⁵

Third, taken together, the programme and data, perhaps with the inference mechanisms contained in the programmes may be seen as a *business method*. According to European law, these are not subject to specific intellectual property protection, but may be protected under the law of certain countries, most notably the US.

In addition, there may, in certain cases, be relevant to refer to the protection against unfair competition, the protection of trade secrets or other general principles, but this will be a concrete application of general provisions on a special case independently of whether that case contains an electronic agent.

3. Patents

According to US law, business methods may be patented if they meet certain criteria.⁶ *State Street versus Signature Financial Group*⁷ of 1998 is often cited as the precedent deciding that business methods in principle are subject to patent protection, in fact on the same basis as computer programmes.

An electronic agent may often imply a business practice. The different elements of the agents – programmes and the imbedded algorithms and the methods for processing data, processing and interpretation of messages, etc – may in such a case be considered as a whole. If a patent is awarded, the rightholder will have an exclusive right to exploit the invention represented by the business method. There are well-known examples of business methods which are – or has been attempted to be – patented, for instance Amazon’s “1-Click” method for the purchase of goods at its site⁸ or the patent of British Telecom for hyperlinks.⁹ Both these examples illustrate the potential generality of such an exclusive right.

European (and Norwegian) patent law does not recognise patent in business methods. It will therefore be an interlegal issue to what extent a US patent for the business practice represented by an electronic agent in practice can be enforced, i.e., a question of jurisdiction and choice of law. In the context of this paper, the interlegal issue will not be pursued. But it is trivial to observe that Internet is international by nature and that US represent a substantial share of the total market. Even if the exclusive right is strictly limited to the US, this would have a strong impact on European operators. And it would be a challenge to program agents in such a way that they did not access marketplaces governed by US law.

It is therefore probable that when agents grow in sophistication, and the use of agents become more common, the legal differences between the US and Europe will create a tension in legal policies which would need to find a solution before a fully functional global market is established.

The relation between business practices and computer programmes is rather close. As mentioned, patents are common for computer programme, also in Europe.¹⁰

An example may be the Norwegian patent for the computer programme BellBoy.¹¹ This is a programme for ordering goods or services which are of limited availability, like seats in a cinema theatre or in an airplane. In the application for the patent, this is illustrated by a service for booking a room at a hotel. The end user contacts a central database and chooses the town or city he or she is going to visit. The database offers a list of the hotels, and also of the rooms available at each hotel. If the end user chooses one of the hotels, the user is switched to the hotel and the room is booked in the traditional way, directly between the end user and the hotel. If a deal is closed, and the room is booked, information is communicated back to the central data base. When the next end user accesses the database, the hotel in question will be shown to have one room less available.

This patent is very close to a business method, and it is of a rather general character – limitations will flow for the interpretation of the patent application.¹² The patent application describes the programme by conventional terms, where the use of the database is prominent, and the end user contacting this database through a terminal. But this could easily have been realised by agent technology: The end user might initiate an agent who seeks contact with the appropriate hotels, negotiates a price for a room for the night or nights in question, closes a contract and returns to the end user with a confirmation.

Again it may be argued that the exclusive right awarded for such a programme may be important for the market. Though a patent for a computer programme may be more limited than a patent for business methods, it is obvious that the programme powering the agent may not be patented in all the jurisdictions of the countries in which the agent may

operate. The global nature of the Internet will here, as in other contexts, emphasise the interlegal tensions.

It would be speculative to pursue such lines of argument. The sketchy outline above is suffice for illustrating that when (pessimists may say “if”) the use of electronic agents becomes commonplace, it will trigger issues of legal policy which today are more of a matter of principles than practices.

4. Copyright

The computer programmes powering the agents will be subject to copyright, presuming they meet the necessary requirement of originality. It is generally thought that the computer programmes for agents are “small” and that their expression will be close to stating the algorithms or rules which the agents are to follow.

In principle, this does not give rise to other issues than those now familiar with respect to copyright protection of computer programmes. There are no reasons to believe that the programming languages do not give the programmes sufficient room for choice so the programmer can give the programme an individual and independent form satisfying the requirement for originality. However, the sharp division between on one side what is the algorithm, and on the other side what is the expression, is problematic in general, and it is believed that this problem will be emphasised for the programmes of agents.

Algorithms are specification of the logical steps to be followed in order for a programme to resolve a certain task. Also, this specification must have a form, and natural language does not have sufficient precision, in practice, to be used for the specification. One may consider how to define a complex mathematical formula in natural language – and one will experience that this becomes difficulty if the formula is more advanced than the theorem of Pythagoras.¹³ Therefore, one will choose a formalism where the elements have a well-defined interpretation (semantic). One may easily use a programming language, not to design a programme for execution, but to take advantage of the possibility in detail to specify the logic and procedure. If this is the case, the algorithm in a sense melts into the expression.

This is not unique for programme of electronic agents; there is no lack of examples where the programmes are written in a language which correspond closely to a formalism of logic, and where this basic distinction will become difficult in practice.

One may also briefly consider the relation between the rightholder and the user of the electronic agent (the principal). The principal will only in exceptional cases have created the programme powering the agent; rather a license for using the programme will have been secured. The other party to

the contract will be a third party, typically a software house, which has the right to license agents to end user. The software house will in turn have to clear the rights upstream to the individual programmers where the original copyright was generated, or to other third parties who on the basis of contract have supplied readymade programming routines or other elements constituting parts of the agent programming. This may in itself be a rather complex situation, where there may be different rights associated with different parts of the programme – the administration of the rights to such a composite agent may be a considerable challenge. But one must presume, of course, that the software house has the right – with respect to upstream rightholders – to license the agent to the principal.

Such a contract will probably be individually negotiated. When the principal employs the agent, the agent will not necessarily reside in one copy only on the hard-disk of the principal, and be executed through repeated reproduction of copies (or parts of the programme) to the central processing unit of the principal's computer, as is the case using a traditional programme, i.e., for word processing. The agent may communicate itself through the net; reproduce one or more copies of itself on servers in the net to facilitate communication with other agents, databases or other features that constitute the electronic marketplace. Therefore the license between the software house and the principal will have to give the principal a right to reproduction that probably has to be wider than the default position users in Europe will be given by the national legislation implementing the Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programmes. According to art 5(1), specific contractual provisions for reproduction shall not be required where the reproduction is necessary for the use of the computer programme. It may be argued that the objective of acquiring an agent presumes such reproduction, and will be allowed according to art 5(1). But the background of the provision is to permit the user to copy the programme from a data carrier like a compact disk to the hard-drive of a workstation or similar reproduction – not the more extensive reproduction different in quality which the agent does by itself when on mission for its principal.

Copyright does not give the rightholder exclusive rights to the basic algorithms or principles. Therefore, policy issues of the same nature as discussed with respect to patents of business methods or computer programmes do not arise. As copyright is becoming regionalised and internationally co-ordinated by the directives and conventions within the EU, the interlegal issues will not be emphasised, at least not within the region. But what is indicated above with respect to the relation between algorithms and expressions may be more problematic than encountered in case law so far. This probably holds generally good with respect to copyright protection of computer programmes, but agent technology may easily become where the problems first will become critical.

5. Databases

5.1. THE DATABASES OF AGENTS

As indicated above, the agent will have recorded data on certain topics, organised to form databases. The databases are not large in terms of the number of items contained, compared to databases for invoicing, public administration, etc. In contrast, rather, they will have limited collections of data. One may presume that the “goal state” will contain data on which type of goods or service the agents are to purchase on behalf of the principal, what is the highest price the principal will be willing to pay, parameters for quantity and quality with respect to the type of goods or service, etc. There also will be data describing the principal, for instance the line of business in which the principal is engaged, the annual turnover, the geographical area in which the principal take an interest, etc – it all will depend on what data are relevant for negotiating price and other conditions. Perhaps, the data are not recorded in a database which the agent “carry along”, but in a database somewhere in the net to which the agent may refer, such a database may then be utilised by several agents (or several copies of the same agent). This will probably be the solution for electronic signatures, associated certificates, the data necessary for the transfer of money, etc. As we do not have an actual reference as an example, indications must suffice.

According to European law, the criterion for obtaining the *sui generis* database protection is that of investment.¹⁴ As indicated above, it is not certain that the specification of data for the agent will represent a substantial investment – it may just be a number of trivial data which the principal will fill into a form offered by the agent in a very short time, and which will specify the mission of the agent. Without actual examples, it has to be presumed that the database or databases¹⁵ which are integrated in the agent, qualify for database protection under European law.

To carry out its mission, the agent will exchange data with other agents. Agents will choose what data to communicate on the basis of the programme powering the agent. Some data will be screened from access by other agents, typically the data specifying the highest price the principal will accept for the goods or service to be purchased – if this was known to the agent “negotiating” on behalf of the seller, the negotiations would be short-circuited.

Presuming that the database of the agent satisfies the criterion for protection, there will also be protection against a foreign agent obtaining access to the database. One cannot exclude the possibility that there in electronic marketplaces are “hostile” agents developed to extract data from an agent in order to make an offer which will be accepted, perhaps without its principal being able to supply the contracted goods or services, but be

satisfied with receiving the payment, giving the principal an economical advantage. How such action should be considered according to criminal law, will not be pursued here. The database protection may contribute – but not suffice – to constrict hostile behaviour from other agents, it would represent an infringement of the database protection.

It is obvious that such legal protection is insufficient, due to the interlegal aspects. In addition also it would not offer the principal an appropriate protection against attacks from hostile agents. One must therefore assume that the agents are programmed to reject such attempts to extract data from other agents. But, if such attempts in spite of the precautions are successful, one may fall back on the database protection (always assuming that the database protection applies).

5.2. AGENTS COMMUNICATION WITH THE DATABASES OF THIRD PARTIES

As the small sketch of an agent implies, the agent communicates with the environment. It will fetch data which the agent qualifies as relevant to carry out its mission. For this purpose, it may make requests to, and itself receive requests from other agents. It will also seek access to databases storing data in an appropriate format for the use of the agent according to its internal rules. If the agent's mission is to purchase a used car, it will for instance seek access to databases offering used cars for sale, and collect data on the model, year of manufacture, distance on the meter, price, etc in order to compare these data with the specifications the principal has defined for the mission of the agent.

This will typically represent a repeated and systematic reproduction of insubstantial parts of the databases in question. According to the database directive art 7(5), this is an infringement if it conflicts with a normal exploitation of the database or unreasonably prejudice the legitimate interests of the maker of the database. It certainly is considered rather difficult to argue that the agents “evaluate” whether there is a conflict with a normal exploitation by accessing a third-party database. The maker of the database has made it available on the Internet to be used, and it seems appropriate to argue that the use of the database will not conflict with the normal exploitation.

But this will not always be the case. One example is *eBay, Inc v Bidder's Edge, Inc*.¹⁶ eBay is a major auction site, Bidder's Edge offered a service using a form of electronic agents. The user might specify the goods or services the user wanted to purchase, for instance a used car. The agent would access a number of websites offering used cars for sale, and compose the retrieved data in a table, presenting this for the user for easy comparison. In this way, the user would not have to actually access the different websites. This was

certainly a convenient solution for the user, but the consequence, of course, was that the user did not visit all the websites, which would include banner advertisements etc. This might reduce the income of the original websites – this was one of eBay’s claims.

eBay had in the root of its website a “robot exclusion header”. This is an instruction formulated according to a standard which specifies what action the website accepts from agents (“robots”) seeking access to the site. A simple “robot.txt” might be:

```
User-agent: googlebot  
Disallow: usedcar.htm
```

This instruction is addressed to a specific robot, “googlebot”, and specifies that this robot is not allowed to index the file “usedcar.htm”. Programmers wanting their programmes to conform to these instructions, included in the programme rules which made the programme read the robot exclusion header before accessing the site, and conform to the instruction therein according to the Robot Exclusion Standard. In the case in question, Bidder’s Edge had failed to programme the agent to obey such instructions, and this was one of the issues the court found relevant when awarding the injunction against Bidder’s Edge future exploitation of the database of eBay.

Comparing this case with the provisions of the database directive, it may be claimed that the instructions convey the view of the rightholder with respect to what the rightholder deems will conflict with a normal exploitation of the database or unreasonably prejudice his or her legitimate interests. The failure of the principal to implement the necessary programme in order to make an agent take into consideration the instructions in conformity with the Robot Exclusion Standard may have consequences with respect to intellectual property law. One may argue that it is a presumption that accessing data in spite of such instruction is an infringement.

Robot Exclusion Standard is only one of several ways being developed to govern the behaviour of electronic agents. In European law, there is at least one instrument indicating that such instructions may be relevant.

The directive on electronic commerce¹⁷ has a Section 4 on the liability of intermediaries. One of the services addressed, is caching of material as part of communicating data through the net. Material is communicated through the net prompted by the request of an end user to have access to a certain site. The material is divided into uniform packets which are communicated in some sort of relay race from server to server until it reaches the end user having requested the material. If a site is popular, several such relay races may be initiated in parallel, and the resources in the net will be consumed

relative to the popularity. Therefore traffic is monitored, and if it is detected that a site becomes very popular, the material is automatically copied to a server¹⁸ and cached closer in the net to the interested end user population. In this way, the resources of the net are optimised.

The directive on electronic commerce art 13 governs the liability of operators of such caching services. The directive prohibits member countries in their national legislation to make the operators liable in a situation where the cached material for instance contains material infringing copyright. However, this is made subject to several conditions. Two of these are:

(b) the provider complies with conditions on access to the information;

(c) the provider complies with rules regarding the updating of the information, specified in a manner widely recognised and used by industry

Referring back to the example of *eBay v Bidder's Edge*, it may be argued that the robot.txt file contains conditions for accessing the material. A better example may be the meta-tags¹⁹ which may be included in the mark-up of HTML pages. An example may be

```
HTTP-EQUIV = "FieldName"
```

This specifies the content of a "HTTP²⁰ response header field". One of the generally accepted values is:²¹

Expires: The date and time after which the document should be considered expired. An illegal date, such as "0" is interpreted as "now." Setting the Expires attribute to 0 may thus be used to force a modification check at each visit. Dates must be given in RFC850 format, in GMT. For example

```
<META HTTP-EQUIV = ''expires'' CONTENT = ''Sun, 28 Dec 1997 09:32:45 GMT'' >
```

The last sentence – the meta-tag – indicates that the material is expired after the date and time specified. It is given in a format widely used and well known. An operator offering a caching service will have programmes monitoring traffic and selecting material for caching. If this operator fails to ensure that the programme can interpret "expires" attributes in the appropriate fields, the

operator has failed to comply with rules regarding the updating of the material. The result will be that the operator cannot claim to be excepted from liability according to art 13 of the directive on electronic commerce.

It may not be advisable further to pursue this line of argument; it may easily become too speculative. But two aspects have been illustrated.

One is that the database protection implies criteria of judgement which may be difficult for a human user – deciding what conflicts with a normal exploitation of the database or “unreasonably prejudice” the right holders legitimate interests. For the programmes of an electronic agent, it will indeed be difficult to model such judgements. To achieve this, would lead into a discussion of knowledge-based methods of some sophistication, and whether the agents should be considered “autonomous”.

Second, and to some extent compensating the first point, there are predeveloped strategies to stipulate “behavioural rules” for electronic agents using explicit instructions related to the resources of the net. These are still in their infancy, but probably we see the beginning of a development towards a legal framework for rights management.

6. Goodwill

An agent will have an identity which can be confirmed by an electronic signature, and authenticated by a certificate. Agents will exchange messages with other agents, and during this process the other agents will be identified and authenticated along with their principals, an exchange of signatures and certificates taking place. These will not always be issued by trusted third parties or similar entities. To some extent, there may be cross-certification, but probably the complexity will make it difficult to maintain a formal system ensuring “trust” among the agents exchanging messages.²²

In the model of an electronic agent introduced above, one of the elements is a “trust model”. It is an obvious presumption that the agents will exchange messages among themselves concerning other agents, relating to how much one agent is to be trusted. One cannot presume that on the marketplace are only agents with “honest intentions” to a greater extent that one can rely on such a presumption in a conventional marketplace. In the discussion of electronic agents, it is characteristic that the concept of “trust” is central, though this is a reference to a representation of trust in a computerised model rather than a mental state in a human being. Agents will make their experiences with respect to willingness to pay, quality of ordered goods, compliances to time limits, etc – in a way corresponding to the experiences gained in trade among persons.

An agent may have two offers from two different agents which superficially are equal. Before a contract is concluded, the agent makes

requests to other agents with which it has had contact, and which it therefore has the necessary data to contact. The request is for data on the trust the other agents have in the two agents making the offers. If it then emerges that one of them is highly trusted, this will be the one awarded the contract – not because the offer in a formal way contains better terms, but because this agent has a high reputation. Such agents with a high reputation may therefore be more successful in a competitive market.

This may cause the agent with a high reputation to gain a value beyond what follows from investment in programmes or data, perhaps comparable to how a website with a certain domain name may gain value.²³ The agent may over time work up goodwill with a market value.

This may imply that agents may be subject to trade as an intangible as such, where the goodwill of the agent is taken into account. Goodwill may in fact be measured by requests to other agents, which may give the relative rank of the agent according to trust models. But the agents are also partly computer programmes which are protected as works or inventions. The principal will rarely be the original rightholder, and this implies that the principals are not free to trade the agents – the principal must have acquired the right to do so with respect to the original rightholder, or there must be a statutory license permitting such trade.²⁴ But it may be of interest to take note of the possibility that the principal through his or her use of the agent may contribute to its value by establishing a goodwill which may be realised at a later date.

A small detour into a related field is tempting. In multi-player games like EverQuest, Ultima Online or Star Wars, the players have virtual items, for instance magical swords or potions. These may be acquired for (real) money, but then the player sets out improving them, in many cases spending months making them more powerful or efficient. It is reported²⁵ from South Korea that of the approximately 40,000 crimes related to information technology for the first six months of 2003, 22,000 were associated with online gaming. People make a living out of acquiring virtual items without consent of the gamer which has developed them, and offering them for sale to other gamers – it is reported that thousands of pounds may be paid for such items. This seems to be closely related to the goodwill of electronic agents discussed above.

7. Final remarks

In this small contribution, an attempt has been made to sketch some of the issues of intellectual property law related to electronic agents. To some

extent, the discussion has a hypothetical perspective – there are current examples of electronic agents, but the marketplaces where the agents meet, exchange messages, negotiate among themselves and act on behalf of their principals, are still very much in its infancy. Though the outline of such marketplaces may be discerned, the details are unknown, and one may in practice possibly confront other and more important legal issues than those indicated here. The issues of intellectual property law indicated that by patent of business methods or programmes, and to a lesser degree by copyright of computer programmes or database rights, also may influence the development of these marketplaces. The meeting between intellectual property law and the requirements demanded by trade in a global, electronic marketplace is still in our future – but ensures that this future will contain interesting discussions of legal policy.

Notes

¹ This paper is based on an intervention at the workshop on the Law of Electronic Agents in Bologna 13 July 2002 (LEA 2002), and supplemented with elements from Jon Bing (2003). *Immaterialrettslige aspekter ved elektroniske agenter*, in Mads Bryde Andersen, Caroline Heide-Jørgensen and Jens Schovsbo (eds.) *Festskrift til Mogens Koktvedgaard*, 43-62 Jurist- og Økonomforbundets Forlag; Copenhagen

² Cf Jon Bing and Giovanni Sartor (2003). (eds.) *The Law of Electronic Agents*, Complex 4/03, Norwegian Research Center for Computers and Law: Oslo. The anthology contains a scenario – referred to as the “Lovely Rita Scenario” – developed within the project Alfebiite (A Logical Framework for Ethical Behaviour between Infohabitants in the Information Trading Economy of the Universal Information Ecosystem, IST-1999-10298). Those interested in a context for the discussion of this paper, are referred to this scenario.

³ The diagram is based on Lloyd Kamara, Department for Electrical and Electronic Engineering at Imperial College, London developed within Alfebiite, A Logical Framework for Ethical Behaviour between Infohabitants in the Information Trading Economy of the Universal Information Ecosystem, IST-1999-10298.

⁴ There may be national variations. For obvious reasons, the background for this paper is Norwegian copyright law, but no specific reference to the provisions will be made. Neither will there be inserted a disclaimer each time reference to law is mentioned, in order to make the reader aware of the possibility of variance between jurisdictions.

⁵ Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, *Official Journal* L 077, 27 March 1996: 20–28.

⁶ US Code title 35 § 101, cf generic class 705: “the generic class for apparatus and corresponding methods for performing data processing”.

⁷ *State Street Bank & Trust Co versus Signature Financial Group, Inc*, 23/7/98, Fed. Cir No 96–1327.

⁸ The patent was contested by Barnes & Nobel, another large bookseller with a presence on the Internet, and the dispute was settled by February 2002.

⁹ This patent is also contested, it is presumed not to apply to the Internet, cf Marit Bolstand *Patentrettslig vern av forretningsmetoder* (ms, Oslo 2002 sect 2.2).

¹⁰ Cf the decision by the Swedish Regeringsrätten of 13 June 1990 (NV Philips’ Gloeilampenfabrieken appeal of the decision by Patentbesvärsträtten of 20 August 1986).

¹¹ The programme is patented in a number of other countries, including the USA.

¹² The interpretation was the issue in the case which BellBoy lost against FilmWeb for Oslo first instance court 16 August 2002. The validity of the patent was not contested. The decision was appealed, and settled out of court by FilmWeb before the appeal court's proceedings. The details of this is not known, but a license for the BellBoy patent was part of the settlement.

¹³ In a right angled triangle, sum of the length of one catheter (a) squared plus the length of the second catheter (b) squared equals the length of the hypotenuse (c) squared, this is rather clumsy compared to the expression $a^2 + b^2 = c^2$.

¹⁴ Under Norwegian and Nordic law, there is an alternative criterion, based on the "catalogue rule" predating the *sui generis* database protection. This criterion is the compilation of a large number of data items. This alternative will not be pursued in the text, but is quite interesting for the jurisdictions to which the catalogue rule applies.

¹⁵ The issue of whether in a legal perspective one should consider there to be several databases, or one database composed of the sum of the different elements, will not be pursued.

¹⁶ Preliminary injunction, United States District Court for the Northern District of California (No C-99-21200 RMW) 14 April 2000.

¹⁷ Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market ("Directive on electronic commerce").

¹⁸ Often known as a proxy-server.

¹⁹ "Tags" refers to the form of parentheses used in the HTML formalism, see example below.

²⁰ Hypertext Transfer Protocol.

²¹ Jfr HTML Tag Reference, <http://devedge.netscape.com/library/manuals/1998/htmlguide/>.

²² Jfr Rolf Riisnæs Electronic Agents and PKI in the 'Lovely Rita' scenario, Jon Bing and Giovanni Sartor The Law of Electronic Agents, CompLex 4/03, Norwegian Research Center for Computers and Law: Oslo 2003: 51–66 developed within the project Alfebiite, A Logical Framework for Ethical Behaviour between Infohabitants in the Information Trading Economy of the Universal Information Ecosystem, IST-1999-10298.

²³ Cf Mads Bryde Andersen *IT-retten*, Forlaget IT-retten: Copenhagen 2001: 504.

²⁴ A practical example will be the provisions in national legislation to sell copyrighted works as part of the business or company.

²⁵ Cf <http://news.bbc.co.uk/1/hi/technology/3138456.stm>.