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Ethics in Deploying Data to make Wise Decisions

Abstract:

Way back in the 1980s corporations began collecting, combining, and crunching data from sources throughout the enterprise. This approach was widely accepted as a methodology that provides objectivity and transparency in decision-making. Good processing of the garnered data paved way for improved analysis of trends and patterns leading to better business and increased profit margins. Corporations began investing in collecting, storing, processing and maintaining enterprise wide data. The focus was always on the quality of data and the process of converting it into knowledge that enables right decisions.

It was soon realized that a wide range of personal biases has an impact on the way decisions are made. The entire process is replete with ethical dilemmas. This paper provides a framework to understand the interplay of data, information, personal biases, ethics and decision-making. This approach is suitable for every individual, team, organization or a nation. Several years of turmoil in South Africa make it imminent for it to take a fresh look at the way data is transformed into knowledge. The leadership within South Africa has to arrive at wise decisions that can withstand the scrutiny of generations to come.

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Introduction

Quantitative approach to corporate decision-making is the process by which one takes the *numbers* and transforms them into *knowledge*, using instincts and experience to fill in when we one doesn't have all the answers [6,7,12,13,17,24,24,27].

The following 10 basic principles provide the framework for using this methodology^[26].

1. If you're not using data to make decisions, you're flying blind.
2. This is all about a process, not a specific technology.
3. Get ready to feel threatened due to improved accountability and transparency.
4. You will be spending more money, not less. Information Systems is the additional investment.
5. Data-driven decision-making does not save time. It refocuses the way business spends time in arriving at a decision.
6. Your data's cleanliness is next to Godliness. It is unfortunate but true that fudging figures is a serious concern.
7. Don't shoot first and ask questions later. In other words do not draw the graph first and plot the points later.
8. A good solution is one you can afford to change.
9. Garnering Data is just the beginning of a long journey in building reliable and robust Information Systems.
10. This approach is highly addictive and often creates **a false impression** that the **"process works like magic"**.

"Our networks are awash in data. A little of it is information. A smidgen of this shows up as knowledge. Combined with ideas, some of that is actually useful. Mix in experience, context, compassion, discipline, humor, tolerance, and humility, and perhaps knowledge becomes wisdom".

Clifford Stoll, astronomer, computer systems administrator, and author.

Data is of two types –Quantitative and Qualitative. 'Quantitative data' is in numerical form and 'qualitative data' is not. Qualitative data could be much more than just words or text. Photographs,

videos, sound recordings and so on, can be considered qualitative data. It is a fact that the qualitative and quantitative data are intimately related to each other. All quantitative data is based upon qualitative judgments; and all qualitative data can be described and manipulated numerically.

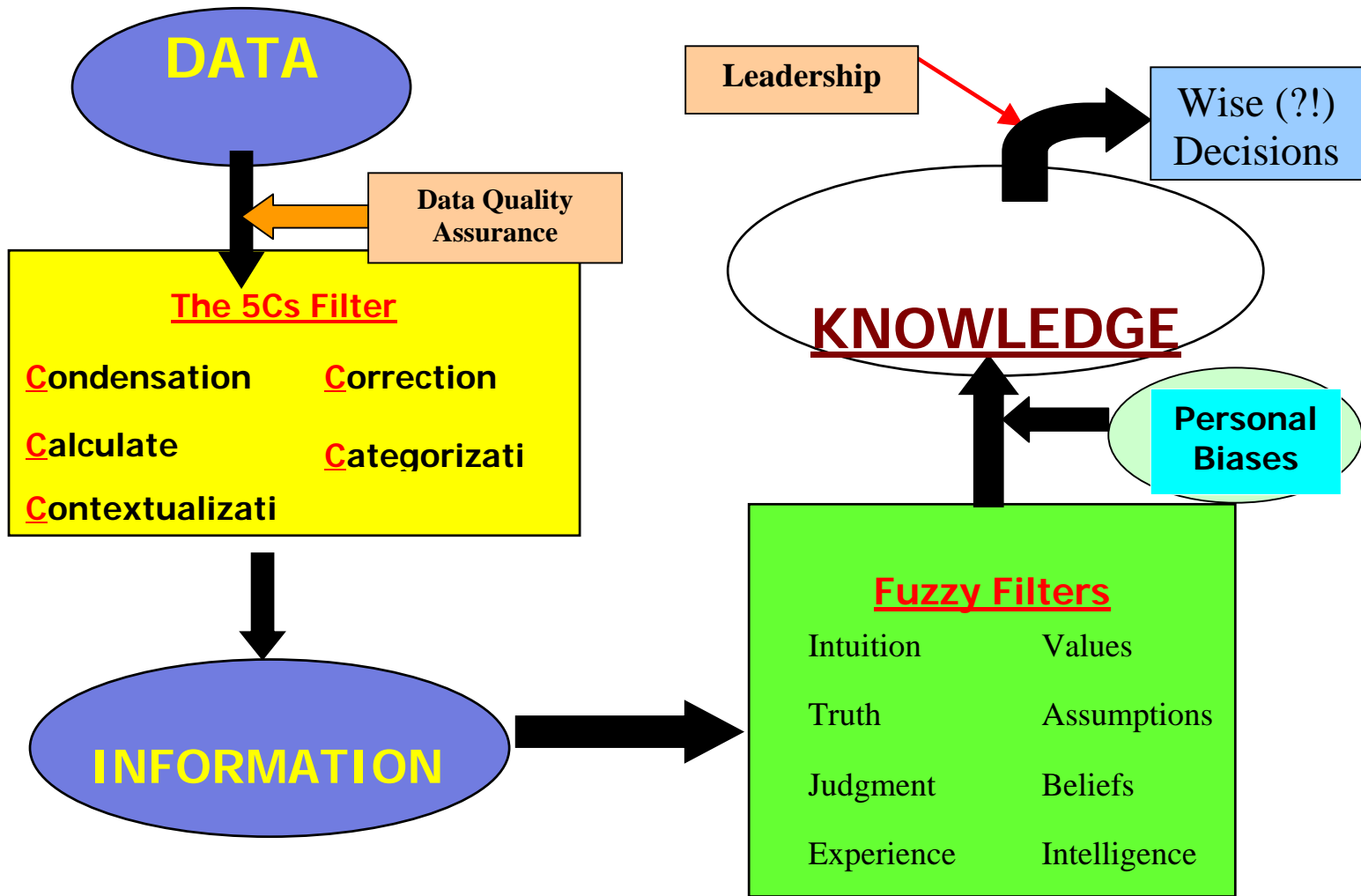
Information and Communication technologies have provides devices and tools to store and transmit both quantitative and qualitative data. The problem is reading meaning from the data and using it to make right business decisions.

Theory states that people are rational and they make complete calculations to reach optimum decisions. In practice, people make decisions based on "limited resources" and "good enough" outcomes. People often make decisions based on the notions of "acceptable risk" and their perception of weaknesses and threats. As a consequence, the following personal biases find a place in the process of decision-making.

- Selective search for evidencePremature termination of search for evidence
- Conservatism and inertia
- Experiential limitations
- Selective perception (Prejudice)
- Wishful thinking or optimism
- Choice-supportive biasRecency - more attention on more recent information
- Repetition bias – Oft repeated choice is the best
- Anchoring and adjustment – Hinging on Initial Information
- Group Think
- Peer Pressure
- Source credibility bias
- Incremental decision making and escalating commitment
- Inconsistency
- Attribution asymmetry : Failure is sheer bad luck and success is due to our abilities
- Role fulfillment
- Underestimating uncertainty and the illusion of control
- Faulty generalizations
- Ascription of causality – Cause: Effect Chains

Figure 1 and Table 1 present a framework for the data-centered approach to making Wise decisions.

Figure 1 Block Schematic depicting the transformation of Data into Wise decisions



The 5Cs Filter	
C ondensation	Summarizing Data ; Eliminating Unnecessary Data
C alculated	Analyzed Data
C ontextualization	Knowing Why the Data was Collected
C orrected	"Data Holes" have been accounted for
C ategorized	Basic Units are Identified

Table 1 The 5Cs Filter indicated in Figure 1

Role of Technology

When you can't effectively integrate information, valuable opportunities are lost — and fraud, regulatory or security threats go unrecognized. The right information in the right hands at the right time can lead to the right action by the right people at the right moment [25,26].

Unfortunately, current techniques limit the breadth and depth of integration. Valuable data and content lie buried in technology silos that are difficult to bridge.

Over the past 15 years, we've seen several integration technologies and methodologies. Extract, Transform and Load (ETL) methodology delivered data integration and paved way for data warehouses. Then Enterprise Application Integration (EAI), along with middleware enabled business-to-business e-commerce. Now there is a surge of interest in enterprise information integration (EII). XML, JSR 170 and other standards figure prominently. "Metadata" — the data about the data that provides schema, table, index and other definitions and context is becoming a valuable tool in implementing information integration.

Integration at a higher level holds great promise, especially as "Semantic Web" standards evolve. Semantic integration is a key strategic direction for both structured data and unstructured content integration because it focuses on meaning: that is, how pieces of information relate to each other.

The primary objectives of semantic integration are:

- Providing metadata that enriches the meaning
- Describing the relationships between things, not just their definitions and attributes
- Providing more abstraction from lower levels of data
- Enabling machines draw inferences directly from semantics.

Information Integration across the enterprise minimizes the scope for subjectivity in decision-making.

"You can use all the quantitative data you can get, but you still have to distrust it and use your own intelligence and judgment"

- Alvin Toffler **Role of Ethics** [12,14,15]

"Information and freedom are indivisible: the information revolution is unthinkable without democracy and true democracy is unimaginable without freedom of information"

- Mr. Kofi Annan, Secretary-General, United Nations

The author takes the liberty of interpreting the usage of the word 'Freedom' in the above quotable quote as 'Freedom' in Free Software and 'Freedom' as in 'Open Access' in addition to the Freedom of a Nation as a whole.

"Spread of information is making transparency and accountability a fact of life for all free governments. The challenge now is to make information available to all. Access is crucial"

- Mr. Kofi Annan, Secretary-General, United Nations

People decide essentially for two reasons

1. To solve the problem
2. To feel good

The first reason [Founded on Mind] leads to exploration of alternative solutions. The second reason [Founded on Emotions] is all about human behavior and its manipulation.

Decision-making is still pervaded by intuition, tacit knowledge, and gut reaction. People decide with their hearts no matter how much their brain tells otherwise. A large percentage of decisions are

based on unconscious needs and wants, such as prestige, habit or perceived values. Typical emotional foundations for deciding are given below.

- **Desire for gain** : usually financial, but also to gain in love, power, respect from other people.
- **Fear of loss** : usually financial, but also emotional.
- **Comfort and Convenience** : making life easier, simpler, more productive, more worthwhile [Individual Perception]
- **Security** : reduce fear of loss [Individual Perception]
- **Prestige and Pride**
- **Satisfaction of Emotion** : 'Feel Good' factor(s)

Attitudes and Ethics usually provide the props in decision-making. Attitudes that aid business are [1,2,3,4,5,8,11,15,16,17,18]:

- Trust
- Self-Control
- Empathy
- Fairness
- Truthfulness
- Learning
- Gratitude
- Civility
- Moral Autonomy

These factors are indicated a 'Fuzzy Filters' in the framework proposed in Figure 1. The 'Fuzzy Filters' also impact the Information Security policies of the organization.

Information Security^[16]

'Information Security' usually entails a policy framework and technology support. Information Security measures usually prevent:

- Unauthorized access to personal and / or critical data
- Unauthorized intrusion into the network or computer system
- Unauthorized usage of copyrighted or patented products, both hardware and software

- Unauthorized usage of computer time

Data Security refers to corporate measures taken to safeguard important data. The popular approaches are Physical Security [Access restrictions; Organizations tend to become a archipelago], Personal Security [Authentication] and Personnel Security [Stringent Selection Procedures for picking people to sensitive posts].

Network Security is an area that has provided a framework comprising several tools and pieces of software. Virus, Worm, DoS, DDoS, Spam and Spyware are proving to be tough nuts to crack.

Plagiarism and Software Piracy are the major concerns in the IPR arena^[21]. While Grid Computing aims at utilizing the idle time of other machines, unaccounted and unauthorized usage of the idle time is a menace.

A short list of Cyber Crimes is given below:

- Unauthorised access by insiders
- Theft of proprietary information
- Computer fraud
- System penetration by outsiders
- Sabotage of data or networks
- Disruption of network traffic
- Computer viruses
- Identity theft
- Personal attack

The People, Process and Technology determine "Accountability" in Information Systems. Accountability is central to making right decisions.

Conclusions

"The information superhighway is a dirt road that won't be paved over until 2025."

-- Sumner Redstone, CEO of Viacom/Blockbuster.

In a sincere attempt to cleanse the information superhighway, information science specialists all over the globe are actively addressing this multi-dimensional problem. Some good solutions are already on the anvil. However, language and cultural divides in addition to the other problems such literacy levels of the population across the globe are proving to be the major hurdles for the solutions to take immediate effect. **The author is sure that the Information technology specialists in South Africa are tailoring the**

solutions to fulfill the felt needs of their citizens residing all over the globe.

This paper presents an integrated framework to making wise decisions. Starting with collecting quality data, the framework factors quantitative and fuzzy filters leading to the knowledge necessary for making decisions. A quick review of technology to help in this process is provided.

The fuzzy filters are founded on right attitudes, ethics and more importantly accountability.

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