

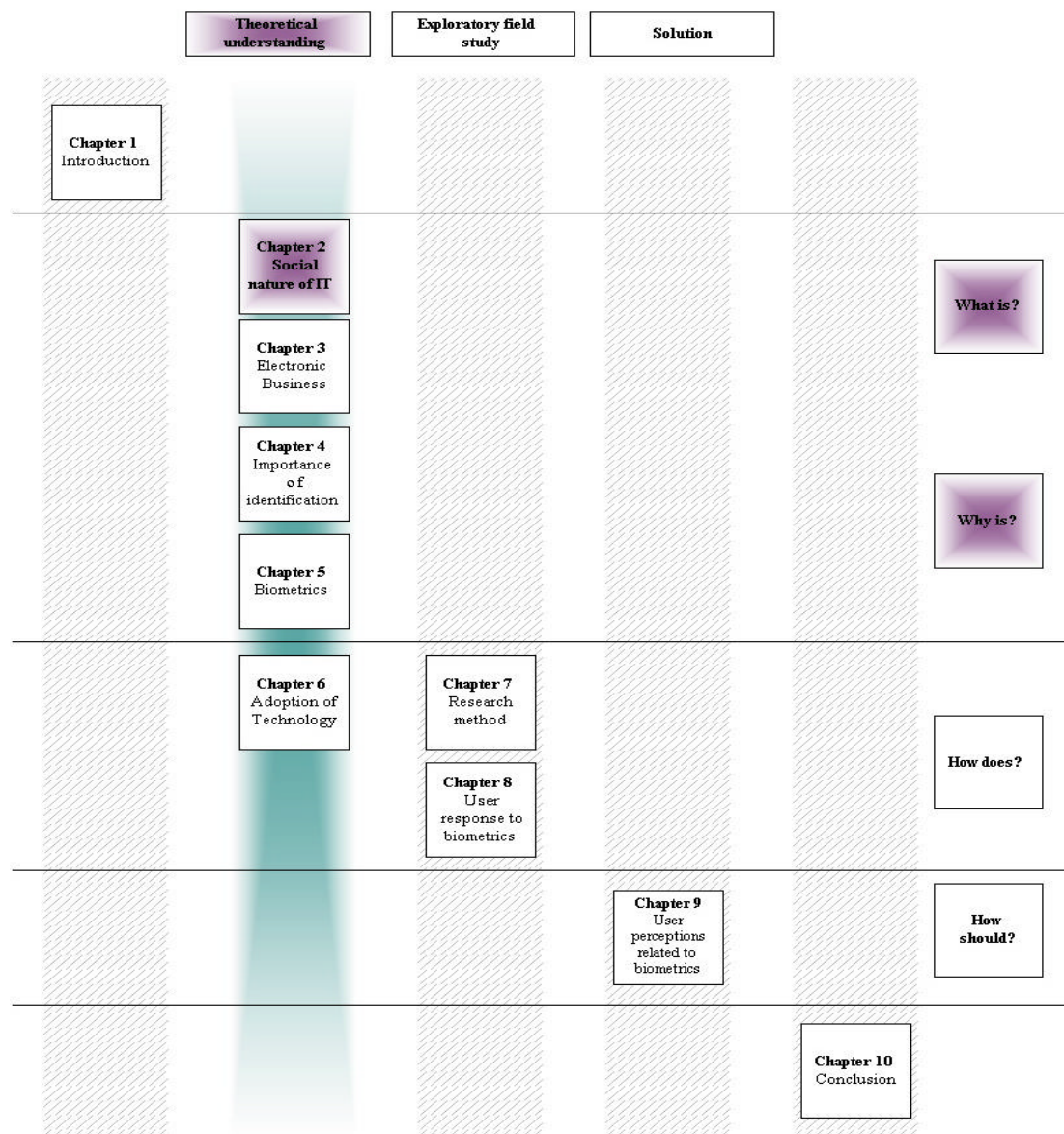
CHAPTER 2: The social nature of Information Technology

2. CHAPTER 2: THE SOCIAL NATURE OF INFORMATION TECHNOLOGY

“The discovery of truth is prevented more effectively not by the false appearance of things present and which mislead into error, not directly by weakness of the reasoning powers, but by preconceived opinion, by prejudice.”

Schopenhauer

Figure 2-1: Thesis roadmap – Chapter 2



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2.1 Introduction

This chapter provides a theoretical understanding of “The social nature of Information Technology”, addressing the research question: “What is meant by the social nature of Information Technology?” This chapter has the following sections:

- ❑ Defining the term Information Technology.
- ❑ Describing the roles that Information Technology can assume within an organization.
- ❑ Discussing the social nature of Information Technology before moving on to the chapter’s summary and conclusion sections.

2.2 Information Technology defined

In general technology is being presented as something new as it drives change at an ever-increasing rate, it is often equated with being modern and holds out a panacea in which the future is invariably better than the past (Chaharbaghi and Willis 2000).

Information Technology can be defined:

- ❑ As the various technologies, which are used in the creation, acquisition, storage, dissemination, retrieval, manipulation and transmission of information (Moll 1983).
- ❑ In its various manifestations, processes data, gathers information, stores collected materials, accumulates knowledge and expedites communication (Chan 2002).
- ❑ As having a primary focus of collecting, organizing, storing, retrieving, interpreting and using information (He 2003)

Information Systems that interlinks with Information Technology can be defined as an integrated, user-machine “system” for providing information to support operations, management, and decision-making functions in an organization (Cornford and Smithson 1996). The “system” utilizes computer

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hardware and software, manual procedures, models for analysis, planning control & decision-making and a database (Cornford and Smithson 1996).

Information Technology is the term that describes the organization's computing and communications infrastructure, including computer systems, telecommunication networks, and multimedia hardware and software (Frenzel 1999) and most information technologies are computer-based and operate on a convergence of electronics and telecommunications devices. Giovannetti and Bellamy (1996) states that the roots of the Information Technology industry are embedded in **three** industrial sectors namely Information Technology, telecommunications and the media, which are becoming increasingly intertwined.

The ability to access required information in real time is shaping the nature of world businesses and giving enormous advantages to countries and organizations that have such abilities (Giovannetti and Bellamy 1996).

Information provision (Rogerson and Fidler 1994) within an organization has evolved through advances in Information Technology and the use of computer based Information Systems. Today information is considered a key corporate resource as organizations strive to enhance products and services through more efficient and effective operations and through being better informed about the operating environment (Rogerson and Fidler 1994).

For the purpose of the research study Information Technology will be defined as the various technologies, which are used in the creation, acquisition, storage (Moll 1983), organization, dissemination, retrieval, processing, manipulation, interpretation, transmission of information (He 2003) to accumulate knowledge and expedite communication (Chan 2002).

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2.3 The roles of Information Technology

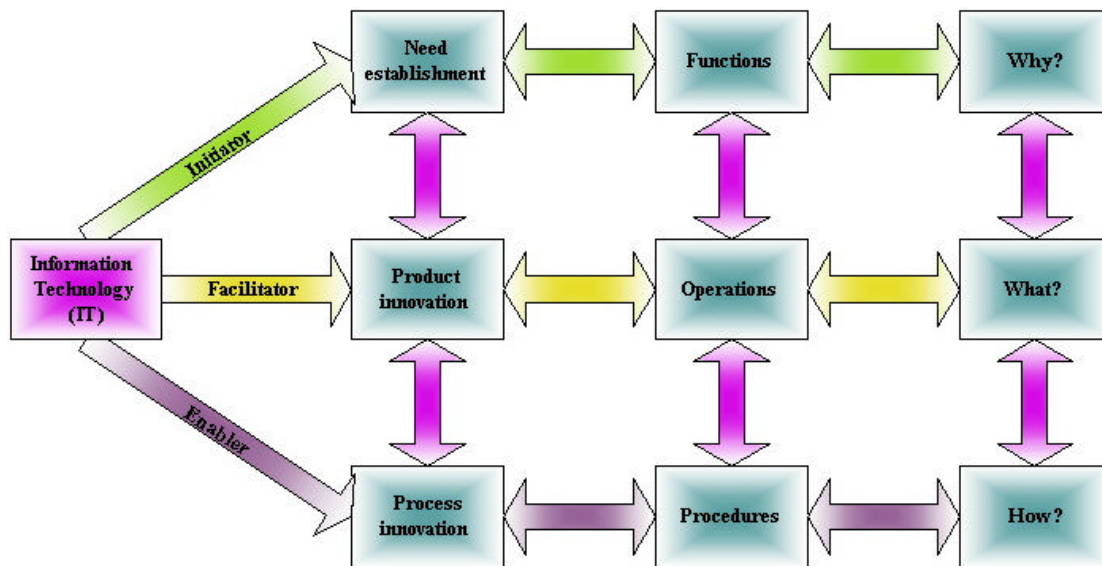
Information Technology, according to Chan (2002), has had radical impacts on Information Technology users, their work and their work environments. Information Technology in its various manifestations (Chan 2002) processes data, gathers information, stores collected materials, accumulates knowledge and expedites communication. In fact, Information Technology plays a role in many, if not most, of the everyday operations of today's organizations – creating new needs, causing new product development and commanding new procedures (Chan and Choi 1997). Chan (2002) proposes a framework for the roles of Information Technology as an initiator, a facilitator, and/or an enabler and he states that Information Technology can assume any of the **three** roles, depending on the organization environment and how technology is being applied:

1. **Initiator**, as an initiator, Information Technology, can be defined as an agent of change or change agent. Information Technology becomes an initiator as it enables people to recognize a powerful solution before even realizing or seeking the problem it may solve (Chan 2002).
2. **Facilitator**, as a facilitator, Information Technology, can serve as something to make the workload easier (Choi and Chan 1997).
3. **Enabler**, as an enabler, Information Technology, can be defined as something that offers the ability or the necessary assistance to accomplish something (Srinivasan and Jayaraman 1999).

The proposed framework designed to help understand the **three** different roles of Information Technology is depicted in the following figure (Chan 2002):

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Figure 2-2: Role of Information Technology



Source: Adapted from source - CHAN, S.L. 2002. Information technology in business processes. *Business process management journal*, 2002, vol.6, no.3, p.224-237.

Information Technology has radical impact on its users, their work and their work environment (Chan 2002) and plays an important role in the everyday operations of organizations. The framework introduced in this section indicates that Information Technology can be an initiator, a facilitator and/or an enabler within an organization and these versatile roles, as described by Chan and Choi (1997), depend on the manner and mode of Information Technology implementation within an organization. The framework (Chan 2002) also illustrates that Information Technology applications need to be thoroughly reviewed for the respective risks and costs involved in each case where Information Technology plays the role of initiator, facilitator and/or enabler. In other words, Information Technology in its different roles will likely lead to different needs and it is concluded that Information Technology has permitted the organization to become more efficient, more flexible and more economically powerful in ways once impossible (Srinivasan and Jayaraman 1999).

Finally, though Information Technology plays such an important role in today's workplace, it is important to remember that it is neither the only cause of progress nor the singular facilitator of change. Given the proposed framework, it is essential to

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keep in mind that “human elements” of individuals play major roles in organizational operations (Chan 2002), including the effective and efficient deployment of Information Technology and Information Systems. Therefore, based on the above statements, it is important to approach the implementation of identification through biometrics in Electronic Business with great care as user perceptions (social factors) will have a definite impact on the success of such an endeavour. Next, the social nature of Information Technology will be discussed as the “human elements” of individuals suggests that Information Systems has a fundamental social nature (Roode 1993).

2.4 The social nature of Information Technology

Many Information Technology applications conceived from the perspective of a rationalistic explanation of how Information Systems are used in an organization exhibit Tayloristic work design, focusing on the individual’s task productivity while under-estimating the importance of the social context. This often leads to inappropriate application designs, difficulty of use and outright failure of many Information Technology systems (Roode 1993). But what is often forgotten, according to Chaharbaghi and Willis (2000), is that the relationship between humankind and technology has existed since human first walked the earth, the term technology itself originates from the Greek word, “techne”, meaning the art of making perfect what seems imperfect in nature and “logy” meaning the study of. Chaharbaghi and Willis (2000) states that technology is not about things – tools, processes, and products; it is about work – the specifically human activity by means of which man pushes back the limitations of the iron biological law. Technology forms some sort of a paradox where individual’s survival depends on it, but their problems derive from it (Chaharbaghi and Willis 2000).

Palmer (2002) came to the conclusion that Information Technology has a number of distinctive features that make its potential to influence social change (social factors) very significant, these features include:

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1. **Ubiquitous application** – Individuals irrespective of the type of business or role they perform can apply Information Technology in many different ways. E.g. an e-mail system, Internet access or data processing capability is just as relevant to a hospital as to a component manufacturer. In fact it is highly likely that they will use similar hardware and software and could communicate and exchange data quickly and easily should they need to.
2. **Dramatic rate of cost decline** – The price of processing power, data storage and transmission has decreased dramatically. E.g. a “Furby” toy contains more processing power than was once used on the Apollo space programme.
3. **Universal ownership** – The increasing utility and ever lower cost of hardware and software means that they are now almost universally adopted. However the availability of bandwidth to enable rapid communication and transmission of data remains problematic in many countries and is therefore, a block to further development.
4. **Exponential growth** – Rapid development and innovation will lead to cost reduction and an increase in capacity. E.g. with surplus capacity in recently installed fibre optic network apparent, due to recent further technology gains, this in turn is likely to stimulate more development.

All of these factors suggest that the pace of change is going to at least be maintained and almost certainly increase due to endogenous growth (Palmer 2002). Thus Information Systems supports and facilitates human and social processes through Information Technology and contributes towards a meaningful work life for the users within an organization. It is concluded (Roode 1993) that Information Systems are developed by people for people and are therefore, rooted within human nature (social context). According to Orlikowski and Robey (1991), Information Technology shapes human action through its provision of structural opportunities and constraints, and on the other hand, Information Technology is itself the product of human action and prior institutional properties. The “impact” that the introduction and use of

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Information Technology may have on the organization, on work and on the users in an organization can either be of a technological nature – that are often explicitly known, or of a social nature – that are usually not as easily identifiable. Nonetheless, it is important that both the technological and social factors should be managed. The research study will however only focus on the social factors and specifically user perceptions related to biometrics, trust amongst participants within Electronic Business and security and privacy considerations within biometric identification systems.

2.5 Summary

This chapter first defined (Moll 1983 and Chan 2002) the terms Information Technology and Information Systems illustrating that information provision (Rogerson and Fidler 1994) within an organization has evolved through advances in Information Technology and the use of computer based Information Systems. Thereafter the different roles of Information Technology as an initiator, a facilitator and/or an enabler was discussed, stating that Information Technology can assume any of the **three** roles, depending on the manner and mode of Information Technology implementation within an organization (Chan 2002). Given Chan's (2002) proposed framework, it is essential to keep in mind that the "human elements" of individuals – issues of personality, culture and society that impacts on user perceptions – play major roles in organizational operations, including the effective and efficient deployment of Information Technology and Information Systems. This last statement, lead to the exploration of the social nature of Information Technology. Roode (1993) suggests that Information Systems supports and facilitates human and social processes through Information Technology and contributes towards a meaningful work life for the users within an organization.

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2.6 Conclusion

It was concluded in this chapter, **Chapter 2 – The social nature of Information Technology**, (Chan 2002) that Information Technology has had a radical impact on Information Technology users, their work and their work environments. In fact, Information Technology plays a role in many, if not most, of the everyday operations of today's organizations. This statement leads to the exploration of the social nature of Information Technology.

Roode (1993) suggests that Information Systems support and facilitate human and social processes through Information Technology, and contribute towards a meaningful work life for the users within an organization. It was further concluded that Information Systems are developed by people for people and are therefore, rooted within human nature (social context).

This chapter has therefore, addressed the research question: “What is meant by the social nature of Information Technology?” The next chapter, Chapter 3 – Electronic Business, will provide a theoretical understanding (literature study) of an “Electronic Business”.