

## CHAPTER 3

### 3. INFORMATION IN CONTEXT

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### **3.1 Introduction**

Information has been defined in chapter 2 as data put into context and perspective. As long as information is not put into context and perspective, we can only call it data, that is, meaningless attributes. But information, like everything else, must fit into a broader framework. In order to be useful, it must play a role in life; fulfil a purpose. To understand information, we need to understand its roles and to do that, we must look at it in context and explore its sphere of influence. This will be explored in chapter 3.

As individuals we need information in order to survive; as members of a social and economical order, we need it to succeed. Every day all of us consume masses of information, mostly without giving it a second thought. Our lives are impregnated with information in its many forms and we have become so used to it that we collect, process and disseminate it relentlessly and subconsciously. The danger exists that, like water, we may take it for granted until one day when we are stranded without it. In order for water to be valuable, it needs to be collected, perhaps processed and channelled through pipes and tubes so as to satisfy the thirsty person opening the faucet.

The same is true for information. The question is: Do we fully understand this role of information in our everyday lives and do we understand the relationships between information and the walks of life? What has been the effect of the "information explosion" on our lives, on society and on the economy? Does it have national implications and what are they?

In order to get an answer to this question, it will be explored how information fits into the lives of individuals, into society, the economy, business, on a national level and, finally, on a global level. This will be used as the framework to explore information in context.

## 3.2 Information and being human

### 3.2.1 Fundamental human needs

Human needs have been studied for many years since the earliest of times, but researchers still come forward with new ideas on the subject. Maslow (in Meyer *et al.*, 1989: 359), perhaps the most popularised psychologist on the subject, classified human needs in two categories, namely deficiency and the growth motives. The deficient motives relate to the more basic needs such as hunger and thirst, in other words, those needs centering around survival and the physiology. The growth motives relate to actualization needs. Maslow identified the first group of needs as the most basic and claimed that they will dominate all other needs should they not be satisfied.

Once a person's physiological needs (hunger, thirst, sleep) have been satisfied, his need for safety will become prominent. The safety needs include security, stability, freedom from fear, the needs for law and order and the likes. Should these be satisfied, the need for belonging is next. This would include love, caring, affection and acceptance by others and to others. The next order is that of self-esteem; it becomes important for the person to be recognised and that appreciation be shown for his achievements, but also an own sense of achievement, confidence and independence.

The highest order, according to Maslow is that of self-actualization. This includes a need for truth, justice, meaningfulness and aesthetic (beauty, perfection) needs. (Meyer *et al.*, 1989: 359 - 362.)

Maslow therefore proposed a hierarchy of needs always starting at the bottom and moving up the ladder but only once the lower needs have been satisfied to a certain level. Should some of the lower order needs again become unsatisfied, the needs will go back to that level until such time that they have again been satisfied.

Murray (in Meyer *et al.*, 1989: 273), another psychologist, also classified needs into two categories, namely the viscerogenic (primary) needs and the psychogenic needs. He identified a human's needs for information as part of the latter group of needs. With "information needs" he means the need to explore, ask questions and seek knowledge, but also to give information; to explain, to lecture and interpret. It is remarkable that Murray's first works appeared in 1938 and that even then information was clearly identified as a need.

Max-Neef (1989: 26) (a developmentalist) and his colleagues differentiated between needs and satisfiers. The needs, as they identified and classified them, are universal to all human beings; they are culturally and historically constant. These (axiological) needs are the needs for subsistence, protection, affection, understanding, participation, idleness, creation, identity and freedom. The hierarchy is limited to two levels only with the need for subsistence (the need to remain alive) as the lower level and the rest all sharing the same level above.

The satisfiers of these needs, on the other hand, vary according to culture and circumstance, to the point where the choice of the satisfiers, in fact, define culture. A need is therefore satisfied at different levels and with different intensities within three contexts: the *Eigenwelt* (oneself), the *Mitwelt* (social group) and the *Umwelt* (environment). Max-Neef and his colleagues make an important observation: Any need which is not adequately satisfied, reveals a human poverty. Hence, an individual, or a community, could have several poverties at the same time. This gives new meaning to the term "poverty" which is usually taken to mean the lack of material goods.

The need for "understanding", as identified by Max-Neef and his colleagues, is of particular importance as it relates strongly and directly to information. The satisfiers associated with this need are curiosity, literature, study, education and others. Information is an integral part of all of these satisfiers. Information is also implicit in most of the other satisfiers especially if one

looks at what Max-Neef calls the violators or destructors. With these violators or destructors present, the satisfiers become impossible, thereby rendering the need unsatisfied. Censorship (deprivation of information) is seen as one of such violators as it would leave the need for understanding, participation, leisure and others unsatisfied. (Max-Neef *et al.*, 1989: 34.)

Pseudo-satisfiers on the other hand, stimulate a false sense of satisfying a need. As such indoctrination would be seen as a pseudo-satisfier for the understanding need. Inhibiting satisfiers are those that would (over-)satisfy one need and inhibit others. An example would be commercial television which would satisfy the need for leisure, but would inhibit the understanding, creation and identity needs. Singular satisfiers are seen as those satisfiers that would satisfy only one need while being neutral to the others. Synergistic satisfiers are those that satisfy more than one need simultaneously. Such satisfiers would, for instance, be popular education which will primarily satisfy the need for understanding, but secondary, the needs for protection, participation, creation, identity and freedom (Max-Neef *et al.*, 1989: 35).

Information runs like a golden thread as an essential ingredient in the satisfying of human needs, regardless of the model used for the classification of needs. Even for the most basic of human needs, namely, the need for survival (Maslow) or subsistence (Max-Neef), hunger, thirst, etc, requires information (knowledge) to be present. (What is safe to eat? Which animals are dangerous?) In the other, "higher" order needs, information and knowledge again appear. Information and human needs cannot be separated; satisfaction of these needs can only be done through the use of information and knowledge.

### 3.2.2 Information and being

To determine the relationship between humans and information, one needs to ask a very fundamental question: What and who are we? What does it mean "to be"? What distinguishes humans from animals? In order to be a person, one needs to have specific capabilities and abilities. It is normal for humans

to consider their futures and try and control it as far as possible. They have ideals for their behaviour; a sense of their own past and of history; the ability to reason; they communicate through language; they have complex conceptions of who they are as well as complex emotions. Animals do not have these characteristics (McInerney, 1992: 101 - 102).

If these are some of the characteristics of a human being, it is clear that, in order to effectively develop and apply them, information about a large number of matters is vital. Meltzer (1981: 152) points out that even the most primitive tribes need information to survive: They need to know what food is safe to eat, where and how to find and retrieve it, etc. This leads him to conclude that information is a basic human need, as was shown in the previous section.

Curiosity is natural to any human being. Long before a child is exposed to formal education, he is curious about everything around him. Not only is he curious: It is a specific characteristic of a human being to attribute meaning to what it observes and experiences. "Indeed, human beings are not simply ready to attribute meanings, they cannot abide meaninglessness" and "Mankind finds an absence of meaning unendurable", write Checkland and Scholes (1990: 1 - 2). Meaning and information go hand in hand: In order to attribute meaning, a basic human characteristic, information must be available.

Frankl (in Meyer *et al.*, 1989: 424 - 431) contends that man is primarily concerned with a will-to-meaning. This view led to his well-known theory called logotherapy ("therapy through meaning"). This theory states that the search for meaning in one's life is a basic human need. "He wants to live a life that makes sense and has meaning" (Meyer *et al.*, 1989: 426). This will is stronger than any other motivation and is found, not created. Taylor (1989: 18) suggests that sense is made of life through articulating it. Introna (1994: 282) says that humans create meaning by expressing themselves through action and words.

The quality of information a person has at his disposal could have a direct influence on his life. Direct observations tells us that there is (worldwide) an inequality of opportunity to be informed and to learn through the transfer of knowledge and information. The use of "high-tech" (advanced technology) further accentuates this phenomenon (Wilson, 1987a: 1). "In terms of print-based information, the third world is already suffering disadvantages but the sophisticated infrastructure required to participate is so lacking as to place them mostly outside the pale of participation" (Wilson, 1987a: 2).

Toffler (1990: 363 - 367) uses the term "Law of Ubiquity". It says that strong commercial and political incentives will arise for making the new electronic infrastructure inclusive, rather than exclusive. He claims that this led to a "maldistribution of information - an 'information divide' as deep as the Grand Canyon". Work requires people to have informational skills and information-illiterate people will find it increasingly difficult to find jobs. It is not only the informational job-skills that are needed, workers must have knowledge about time, dress, courtesy, money and language.

Humans and information cannot be separated. In order to be, the being searches for meaning: To find meaning, it needs information. Humans and information are eternally interlinked and without the one, the other becomes meaningless.

### **3.2.3 Information and communication**

It was shown in section 3.2.2 that humans search for meaning in their lives. Part of the process of attributing meaning, is expressing oneself. Expression without someone to express oneself to, is meaningless. Expression must be towards something and with a particular intention (Introna, 1994: 279). It can either take place through action or through speech. This leads to the phenomenon of communication through language; another unique attribute of humans.



The communication model involves five steps, namely, meaning, encoding, transmission, decoding and meaning. Encoding takes the form of language (words), facial expressions of gestures or even physical actions. Transmission takes place through some channel, for instance, a page of paper. Decoding is done through sense perception, for instance, hearing or seeing. Once the message is received, meaning must again be attached to the message (Griffin, 1987: 488, 489).

Communication takes place through the use of signs. These signs can have various properties. Tools, varying from a social to a technical analysis, have been developed to analyse the communication process. Pragmatics focus on the content and purpose of communication whereas syntactics and empirics focus on form and means.

Pragmatics takes into account the general culture and context of communication. Semantics concentrates on meaning and knowledge and considers the signs used and the actions or behaviour as a result of the signs. Syntactics focuses on logic and grammar. "Syntactics provides us with the rules for the construction of formal rules and the means by which they interrelate" (Liebenau and Backhouse, 1990, 13).

Empirics concerns itself with the codes, signals and physical characteristics of the media of communication. It includes the mechanics for encoding and decoding of the signals as well as the speed and quantity of the signals. The process of analysing signs and how they function is called semiotics and is based upon the work of the French linguist, Ferdinand de Saussure, Charles Morris, Claude Levi-Strauss, C.S. Peirce and John Locke. It provides useful tools for analysing signs used in communication on all these four levels (Liebenau and Backhouse, 1990, 13 - 15; Stamper, 1973, 18).

Vickery and Vickery (1987: 16) show that all social processes depend on communication. It forms the basis for all social processes. "Though rarely *homo sapiens*, we are inherently *homo loquens*" (Vickery and Vickery, 1987:

16). They argue that the main functions of communication are informing, instructing, commanding and influencing. Regardless of the purpose or function, information is passed from the sender to the receiver. The ideal communication takes place through the "hermeneutic circle" whereby information is passed in both directions between the sender and the receiver until true understanding (via appropriation) takes place.

The fact is that through communication - verbal or otherwise - data flows between two or more parties. Hence, communication is impossible without data. Without data to communicate, why would it be necessary to communicate in the first place? Through communication, that is, the transfer of data, context is added and information and knowledge are created. Communication, a fundamental social process, is therefore integrally linked with information.

#### **3.2.4 Information and learning**

For any human being to cope in adult life, two factors are essential: His ability to physically grow and his ability to learn. Growth is determined genetically while learning is directly influenced by events in the individual's living environment. Learning is defined as "a change in human disposition or capability, which can be retained, and which is not simply ascribable to the process of growth" (Gagné, 1970: 2 - 3). Learning therefore implies a change in behaviour or an increased capability for some type of performance. It furthermore calls for a change in attitude, interest or value, must be more than just momentary and distinguishable from changes that can be attributed to growth.

Examination of the learning event shows that there must be a learner (that is, one with a desire to learn) and a stimulus affecting the learner in such a way that his performance changes from what it was before the event to what it is after the event. If this change has not taken place, learning did not occur.

Gagné (1970: 70 *et seq.*) contends that the stimulus must first be apprehended, meaning that it must attract the learner's attention, thereby acknowledging and registering it. At this stage learning has not yet taken place; one can apprehend without necessarily learning something. It is only when the stimulus is acquired by the learner, that performance is changed and that learning took place. Once acquired, it must be stored, preferably in long-term memory for possible later retrieval.

The question is: What represents a stimulus? It would seem that the stimulus educationalists talk about, can only be information (or better still, data). A stimulus can only be observed by the senses and the senses pass that on to the brain as data. Once interpreted and put into context, it becomes information.

Learning therefore rests firmly on information, or more fundamentally, data as its base. For learning to take place, data in some form or another must be passed to the brain by the senses. This data must be appropriated to become information (Introna's proposition). The proposal put forward in this thesis is that data must be put into context and perspective to become information. The teacher is the instrument to help with the process of appropriation, contextualising or perspecting (information-as-process leading to information-as-knowledge). This information, combined within perspective, context and history, through an interpretation process, may lead to knowledge and wisdom.

How do we know that learning actually happened? This question leads to the field of educational didactics. Various researchers proposed classifications schemes or taxonomies that can be applied to determine if, and to what extent, learning took place. Bloom (in 1956), Guilford (in 1967), de Corte (in 1973) and Gresse (in 1975) each developed a classification scheme that is useful. These combined views are depicted in table 3.1.

Bloom's taxonomy is hierarchical, meaning that within the cognitive domain there are six levels of knowing; the lowest and simplest form is the ability to remember facts (called knowledge by Bloom) and the highest, more complex

Table 3.1

**Bloom's Classification Scheme**

Bloom's educational goals	Guilford's intellectual abilities	De Corte's categories of cognitive action	Gresse's verbal interaction instrument
<i>Knowledge</i> based on:	Memory	Reproduction	Reproduction
<i>Understanding</i> based on:	Cognition	Apperception and recognition	Reception
<i>Application</i> based on:	Divergent and convergent production	Interpretative production	Interpretative
<i>Analysis</i> based on:	Divergent and convergent production	Convergent and divergent production	Convergent and divergent
<i>Synthesis</i> based on:	Divergent and convergent production	Convergent and divergent production	Convergent and divergence
<i>Evaluation</i> based on:	Evaluation	Evaluation	Evaluation

(Müller, 1986:80)

level is the ability to make quantitative or qualitative judgements (called evaluation) (Hamachek, 1990: 352). Between these extremes lie levels of understanding, application analysis and synthesis. The goals on the higher levels cannot be achieved unless the goals on the lower levels have been satisfied (Müller, 1986: 80). According to table 3.1, for instance, knowledge (the ability to remember facts), as an educational goal is accomplished through the *intellectual* ability to memorise (Guilford), the ability to *cognitively act* by reproducing those facts (De Corte) and the ability to *interact verbally* also through reproduction (Gresse).

Although perhaps not directly, there seems to be a relationship between Bloom's scheme and the concepts of data, information, knowledge and wisdom. Bloom's argument goes as follows: Knowledge (defined as the ability to

remember facts) leads to understanding through cognition and perception, that leads to application, then to analysis, to synthesis and eventually to evaluation. The line of argumentation in this thesis goes: Data leads to information through context and perception which leads to knowledge and then to wisdom. This can be depicted as in table 3.2.

In conclusion: Fundamental to the learning process is information (in a generic sense). Without it no learning can happen. Varying ability to assimilate and appropriate data differentiates individuals. Some, the followers, will remain on the first level while others, the leaders, will reach the higher levels. The challenge for the information manager is to assist and facilitate workers and managers to reach the higher levels.

### 3.3 Information and society

#### 3.3.1 The information society

The concept of an information society appeared around 1970 and gained momentum in 1974 based upon the work of Daniel Bell in his book *"The coming of postindustrial society: A venture in social forecasting"*. The argument was that agrarian (pre-industrial) economy has been replaced by an industrial sector when the economic emphasis shifted from agriculture (including mining, fishing, timber and other resources such as natural gas and oil) to manufacturing. A characteristic of the pre-industrial economy is its *extractive* nature, whereas the industrial economy is characterised by a focus on *fabricating* of goods.

Within the industrial economy, a post-industrial sector evolved when a shift took place from manufacturing to the provision of services. The services sector is characterised by *processing* where telecommunications and computers play crucial roles for the exchange of information and knowledge (Bell, 1976: xii).

Table 3.2

**Comparison of Bloom's classification and the relationship between data, information, knowledge and wisdom**

Bloom's classification	This thesis' classification
Knowledge ↓ Understanding ↓ Application ↓ Analysis ↓ Synthesis ↓ Evaluation	Data ↓ Information ↓ Knowledge ↓ Wisdom

It follows logically that if the economy is in a post-industrial phase, society should also move from an industrial society to a post-industrial society. It is important to note that Bell's famous publication was firstly an analysis of the state of society and the economy, but many of his statements were meant as forecasts, as the name of the book indicates.

Bell not only argued the concept of postindustrial society as many before and after him have done (notably Alain Torraire in 1969 and Tom Stonier in 1983), but took it a step further in speculating that, not only was a post-industrial society evolving, it was, in fact, evolving as an information society (Bell, 1976: 467). In this information society knowledge and information was replacing labour and capital as the central variables of the economy (Bell, 1976: xiii). Bell points out though that the post-industrial society does not *displace* the industrial society; it is merely adding another layer.

The dimensions of the post-industrial society are listed by Bell as follows (Bell, 1976: xvi *et seq.*):

- Knowledge becomes central.
- Mathematical and economic techniques will be used to find more "rational" solutions to "economic and engineering, if not social, problems" (Bell, 1976: xvi).
- A spread of a knowledge class. (Technical and professional people will be the fastest growing group in society)
- A change from goods to services, more specifically human, technical and professional services.
- A change in the character of work. Nature and artifacts are excluded from work and work-life becomes a "game between persons" where they have to learn to live with one another, an "unparalleled state of affairs" (Bell, 1976: xvii).
- Employment opportunities for women will expand thereby providing women a secure base for economic independence for the first time.
- Science will become integrated with technology, the military and society in general, thereby losing its charismatic nature where the quest for knowledge and not its application, is the ultimate goal.
- The formation of society into "situs", a vertical order as opposed to a previously horizontal order in society. The interest conflict will occur between these situs groups and may lead to political grouping. He identified four *functional* situs, namely, scientific, technological, administrative and cultural and five *institutional* situs, namely, economic enterprises, government bureaus, universities, social complexes and the military.

- Achievement rewards would be based more on merit (education and skills) than on inheritance or property (meritocracy).
- Scarcity focusing on information and on time and less on goods.
- Whereas the spreading of goods took place through competition between producers, the spreading of information in the post-industrial society will have to take place through a cooperative strategy in order to spread and use knowledge in society. This is because information is a collective rather than a private good. Bell calls this the "economics of information" and identifies it as "the most fascinating challenge to economists and decision makers in respect to both theory and policy in the post-industrial society" (Bell, 1976: xviii - xix).

The difference between pre-industrial, industrial and post-industrial society is illustrated by Bell (1976: 117) as in table 3.3.

The information society idea seemed to gain momentum with the convergence of different technologies such as telecommunications, television, computers and the likes. This is not unexpected when it is considered that these technologies enabled data to be stored and processed in ways never possible before.

Bell's concepts are evident in Toffler's work (1980) with his "third wave" concept; the first wave being agriculture, the second industrial and the third information. A major part of this third wave would be decentralised work, or the "electronic cottage", as Toffler called it. Workers would be allowed to work from home by means of remote terminal or workstation access to centralised computers, thereby enabling particularly women and disabled people to be economically productive while, in the case of women, caring for children at the same time. It would also be contributing significantly to a reduction of air pollution and saving on energy by limiting commuting. Although the idea may have held many promises, Lyon (1991: 83) reports that progress was rather slow. It would seem that face-to-face communication was needed more



**Table 3.3**  
**General Schema of Social Change**

	<b>Pre-industrial</b>	<b>Industrial</b>	<b>Post-industrial</b>	
Regions:	Asia Africa Latin America	Western Europe Soviet Union Japan	United States	
Economic sector:	Primary extractive: Agriculture Mining Fishing Timber	Secondary Goods producing: Manufacturing Processing	<b>Tertiary</b> Transportation Utilities	<b>Quaternary</b> Trade Finance Insurance Real Estate
			<b>Quinary</b> Health Education Research Government Recreation	
Occupational slope:	Farmer Miner Fisherman Unskilled worker	Semi-skilled worker Engineer	Professional and technical Scientists	
Technology:	Raw materials	Energy	Information	
Design:	Game against nature	Game against fabrication	Game between persons	
Methodology:	Common sense experience	Empiricism Experimentation	Abstract theory: models, simulation, decision theory, system analysis	
Time perspective:	Orientation to the past Ad hoc responses	Ad hoc adaptiveness Projections	Future orientation Forecasting	
Axial principle:	Traditionalism: Land/resource limitation	Economic growth; State or private control of investment decisions	Centrality of and codification of theoretical knowledge	

(Bell, 1976: 117)

than was originally thought. Unions in general were also not much in favour of the electronic cottage concept.

Naisbitt and Aburdene (1991: 282) coined the term "electronic heartland" rather than electronic cottage. They noticed a distinct trend to move away from the big cities to smaller rural settlements. With the help of fax machines, computers linked into networks, telephones and fast courier services, remote people could be as close to business as their city-dwelling counterparts. The scattered electronic cottages of Toffler may develop into electronic heartlands. "The very nature of the information economy makes it easier to be part of this trend" (Naisbitt and Aburdene, 1991: 284).

In 1971 Japan gave a major impetus to the idea of an information society by producing a proposal in the shape of *"The plan for information society: A national goal toward the year 2000"* and followed in 1981 with a book by Yoneji Masuda (in Lyon, 1991: 6). In these works a futuristic view is painted where information technologies create an almost utopia-like world. Masuda (in Lyon, 1991: 6) wrote "...the goal ...is a society that brings about a general flourishing state of human intellectual creativity, instead of affluent material consumption". This corresponds with Bell's meritocracy concept. Masuda also introduces the concept of information society infrastructures and "new towns" with built-in co-axial cabling as the data carrier. This concept was put in practice with the building of Japan's Tama New Town. Stonier (1983: 202) echoed Masuda's view and writes: "Living in a postindustrial world means that not only are we more affluent, more resourceful and less likely to go to war, but also more likely to democratise". These views correspond with the one of Naisbitt and Aburdene who predict that the truly global cities of the year 2000, would not be those that are the largest, but those who are the "smartest", consisting of "smart" buildings (presumably having "smart" streets, "smart" homes inhabited by "smart" people).

Bell (1976: xv) also realised the need for an appropriate infrastructure for the post-industrial society. The pre-industrial society needed the first infrastructure, namely roads, canals, rail and air for proper movement of people and goods. The second infrastructure was for the energy utilities such as networks for pipelines, gas and electricity. The third infrastructure would be

telecommunications (radio, TV, etc.) but Bell forecasted that an infrastructure would be needed to link together the increasing number of computers so as to effectively transmit data and information. This forecast proved to be accurate when looking at the growth in data networks and the building of "smart cities" linked together by "data highways".

Based on the above viewpoints, one could argue that we are living in an information society. "Our society is truly an information society, our time an information age", writes Mason (1986: 46). Strassmann (1985: 188), however, seems to doubt the information society concept and writes: "Information is primarily a means of production rather than an item of consumption. Calling the postindustrial economy an information society is a misnomer." The point Strassmann makes is that even though society consumes "enormous amounts of information", it is only as a part of purchases from the production sector. It is difficult to agree with Strassmann's argument on information not being an item of consumption. Information is indeed consumed on a daily basis by millions all over the world. People, businesses and nations are buying it and trading in it. It is, perhaps, the unique characteristics of information - such as its non-depleteability - that prompts Strassman's views.

The role of information has been emphasised over the years and it is growing in importance. The growth in the service industry possibly contributed to the importance attached to information. Porter (1986: 9) says: "There can be no doubt that the Information Age has arrived for the working world. We meet it driving to work as we use our cellular phones, at work in our electronic offices, and back home as we plug in our personal computers to do our 'homework'. Analysis of the article - even the above quote - by Porter shows that his interpretation of the concept "information" is very closely equated with information technology with the implication that the "information age" he is referring to could just as well mean the "information technology age".

It is granted that information technology has a direct bearing on information itself in the sense that technology plays a very significant role as the enabler.

Without technology, the processing, generation and distribution of information, amongst others, would be impeded. It is therefore not totally wrong to relate what is happening in the information technology world to what is happening in the information world. It certainly does provide the conduits necessary for the data, information and knowledge to flow. Otten (1984: 17) uses the term "Information Tools". These tools are being used in the information society by the information workers and include computers.

Cleveland (1982: 38) points out that it is not necessarily "better" or "worse" to be living in an information society rather than living in an agricultural or industrial society. These aspects are dependent on "...who uses the information, in how a refined form, and for what purposes".

What, then, is meant with the notion of being an "information society"? Reduced to its basics, it means that workers have changed from using their hands to using their brains. It means putting minds to work rather than putting muscles to work. In the agricultural and the industrial eras, the majority workers were doing manual work (the workers) and the minority were doing the "thinking" (the managers). In the information era more people are working in and around the thinking part through, *inter alia*, generating, collecting, organising and manipulating information.

Businesses are out-"smarting" each other by more effective uses of information rather than out-"performing" each other by producing more items or items of higher quality. And it appeals to the consumer because he is also "smarter" in his purchases. That is what gave rise to the concept of an information society. It is about a society which is conscious about everything around it by constantly informing itself. Shoshana Zuboff (1988: 10) coined the concept of "informating technology" to describe the use of technology to achieve more than just automation. It is the way in which corporations and individuals use information distinguishes the one from the other. An information rich society competes globally; an information poor society goes begging.

But the information society goes further than just that. It does mean that fundamental changes to the economic and occupational systems are taking place, but, more importantly, these changes have serious effects on the social structures. These, in turn, may have an effect on the polity and culture. This is important to the individual, who is confronted with a changing occupational system where knowledge becomes paramount, it is important to business to position itself for survival in an economy having a different locomotive and it is important to governments, having to deal with a changing society as its constituency.

### **3.3.2 An information culture**

It is well known fact that the everyday use of information technology has had a dramatic effect on every citizen's life (Zuboff, 1988, Toffler, 1990). Relatively few households do not have a television set and few individuals do not make use of automated teller machines for their banking. More and more households are getting computers with children spending long hours playing games and adults doing more productive work such as managing their financial affairs. Work has become "portable" using cellular phones and notebook computers. Electronic communication via computer has become an accepted way of communicating and, to a limited extent, for shopping via vast electronic mail networks, bulletin boards and "electronic malls". There is no indication that this trend will not continue; on the contrary, it is likely to grow at an even faster rate.

The question is: Will this extensive use of technology and obsessiveness with information breed a new culture? It is conceivable that a world characterised by (and sometimes obsessed with) telecommunications, mass communications and information technology, could have a cultural "synchronisation" effect, as similar messages encircle the globe through the use of these technologies. Lyon (1991: 16) argues that exactly this is already happening. (The ethical question is raised: Who controls these messages and could it lead to cultural

dominance of one group (the information rich) over the other (the information poor)?)

The potential of television to influence culture is acknowledged by many and in this regard Britain already ruled that its TV stations may only broadcast 14 percent of non-EEC material while in France state radio was allowed only up to 50 percent American popular music to be broadcast (Lyon, 1991: 128). In the USA, the Coalition for Better Broadcasting tried to limit the sex-and-violence content of television programmes by resorting to media-strikes (Lyon, 1991: 129). These point to a perceived threat of data in the form of electronic images having negative influences on, at least, moral standards, but ultimately even on culture.

If it is accepted that there was a shift away from industrialisation to a services based economy, or that we have become an "information society", is there any evidence of cultural trends changing? Naisbitt and Aburdene (1991: 121) contend that English became the language of the information age. They claim that "more than 80 per cent of all information stored in the more than 100 million computers around the world is in English. Eighty-five per cent of international telephone conversations are conducted in English, as are three-quarters of the world's mail, telexes, and cables. ...more than 80 per cent of all scientific papers are published first in English." (Naisbitt and Aburdene, 1991: 121). They also claim that the language of international business, diplomatic and ecumenical communications and communications of the international youth culture are all done in English. But then they add a very important rider to their argument: There seems to be a backlash against it as nations are insisting on keeping their traditional languages and cultures alive (Naisbitt and Aburdene, 1991: 123 - 124). This "backlash" perhaps provides proof of the negative effects of changing language could have on culture.

Bell (1976: xxi) contends that changes to the social structure is the major theme of post-industrialism and that this will only indirectly influence culture. Max-Neef (1989: 21) contends that basic human needs are universal to all

cultures, but that the choice of quantity and quality of satisfiers to human needs is culturally determined. Should, however, changes take place in terms of traditional satisfiers for the purpose or dropping old ones or adopting new ones, cultural changes could take place. If this argument is applied to the post-industrial economy and society, it is clear that, should the changes have an effect on the choice of satisfiers, cultural changes could be expected.

Lyon (1991: 16) quotes David Bolter who introduced the concept of the computer becoming the key symbol of the information age; the "defining technology", leading to humans thinking of themselves as information processors and nature as information to be processed. Computer games have progressed to virtual reality where a person can escape into a virtual, make-believe world (called cyberspace) in which he can actively participate. It would even seem that the male gender of computers (algorithmic and logical) has begun to change to more female-type behaviour (fuzzy-logic). Computers, through the application of "artificial intelligence", are already able to "think" and learn from their own mistakes and inferior knowledge. Lyon (1991: 131) quotes Steve Woolgar, a sociologist, who asks: "Why not a sociology of machines" and "In what sense can we continue to presume that human intelligence is not artificial?"

Extending this argument further to religious and ideological aspects, could it happen that humans begin to think of themselves as being in the image of their technology, thereby shaping a completely new religion and, perhaps, a new culture (Lyon, 1991: 17)?

When talking about cultural change, Glastonbury and LaMendola (1992: 68) remind us that while technological change has a span of 40 years, cultural change has a span of nearer to 200 years. Span in this context is taken as the time between a change being initiated until it is an observable fact. It may, therefore, still be difficult to clearly identify cultural changes resulting from society's use of information and information technology. However, the world we are living in, regardless whether it is called the information age or not, has

already had an impact on our lives, our language, our eating habits, our apparel and our behaviour. Most nations and ethnical groupings do not live in isolation any more as the boundaries dividing and differentiating between them are becoming more vague. This is bound to have significant effects on traditional culture if it has not created a new one already.

### **3.3.3 Information and development**

To improve one's own living conditions, social standing, education and wealth comes naturally to all human beings. It also comes naturally to want to do the same to other people and communities. In fact, as Boon (1992: 22) points out, it has its origins at the time of creation when God gave man the instruction to manage His creation. Billions of all currencies are being spent annually on the development of communities around the world. All governments allocate funds to develop their own communities and some countries are willing to allocate funding to those in other (poorer) countries. Development is big business and development institutions proliferate the globe. Despite all of these efforts, the world is still divided in two major groupings: The richer (developed) countries living in the first world on the one hand and the poorer (developing) countries living mostly in the third world on the other. Positioned somewhere between these extremes, are the NIE's, the newly industrialised economies.

Despite the fact that development has been around for so long, longer term, sustainable results are not so easy to find. One reason for this phenomenon is that it is not as straightforward to measure the success of development as it at first appear to be. And if it is difficult to measure, it is difficult to decide where to invest with the best longer-term yield. Earlier the emphasis was placed on the economic side: An increase in the Gross National Product (GNP) or in the per capita income meant that development was succeeding, the reasoning being that this kind of growth would "trickle down" to the masses. In the later years, it was realised that concentrating on the economy only was not good enough. Despite growth in GNP and per capita income, living conditions of the masses still remain unchanged.



This called for a revision of the measurement and, indeed the definition of development. Development is more than just an improvement in the economy (Du Plooy *et al.*, 1993: 3). "Development includes socio-cultural, educational and economic change, to name just a few" (Boon, 1992: 229). "Now we need an indicator about the qualitative growth of people" (Max-Neef *et al.*, 1989: 19).

Todaro (1989) suggests three core values of development: life sustenance (the basic needs), self-esteem (being a person) and freedom from servitude (the ability to choose). He showed that economic success was a necessary but not a sufficient condition for development in a socio-economic sense.

Max-Neef, one of the newer developmentalists, coined the term "human scale development"; "*Development is about people and not about objects*. This is the basic postulate of Human Scale Development" (Max-Neef *et al.*, 1989: 19). He revisited what human needs really are and paid particular attention to the satisfiers of the needs (see section 3.2.1). This he took as the point of departure to address the development issue.

If people are central to development, it follows that information has an important role to play in the development process. It was shown earlier that humans and information cannot be separated meaningfully; information must therefore also be central when it comes to development. Material resources naturally play a very important role in developing people. People must have houses, water and electricity, money and so on, but if people have to be fully developed so that all their needs are being addressed, information and knowledge must also be transferred (Boon, 1992: 229).

The needs of people in under-developed countries usually focus around the basic needs, that is, the physiological (hunger, thirst) and protective (shelter) needs. If Maslow's needs hierarchy is used, it could be argued that people with those basic needs would not have any need (yet) for information because information would lie on a higher level. Both Todaro and Max-Neef place less

emphasis on a hierarchy of needs. Once the basic need of subsistence has been achieved, all, or a combination of other needs will appear. This combination depends on the culture as the choice of the satisfiers is determined by cultures (Max-Neef *et al.*, 1989: 21). Information would obviously be one of the important need-satisfiers.

Information would manifest itself, *inter alia*, in the form of education (knowledge transfer), freedom of speech and of the press and access to information sources such as libraries. To the decision makers in the development field, information is indispensable. Demographic, socio-economic and other information in the form of statistical (census) data is essential to determine where investments are to be made to obtain the best yield. As Boon (1992: 71) points out, this kind of information is not always available and if they are available, they are sometimes regarded as suspect because of distrust in the government collecting and disseminating the information for its own agenda. All of this calls for an information infrastructure to be available or established. Hanna (1991: 10) points out that such an infrastructure is, more than often, not present in developing countries.

The stakeholders, or role-players in the development process can therefore be classified into three groups, namely, the people who are to benefit, the people who are involved on an operational level (the developers) and then the people who are involved in a project management capacity (Boon, 1992: 234). Boon also suggests that the required information must satisfy certain conditions to be useful to the development process:

- The information must be easy to use through user-friendly interfaces;
- Access to and retrieval of the required information must be possible;
- Quality must be high, that is, the information must be accurate, comprehensible, current, reliable and valid;

- The delivery of the information must be adaptable to the particular need.

Boon (1992: 234) argues that information has not always played the role in development that it could. He lists a number of reasons for this failure and suggests possible solutions to rectify them as in table 3.4.

In conclusion Boon places specific emphasis on the need for a national information policy to provide a framework for information and development. National information policies are explored more fully in section 3.6.2.

Hanna (1991: 5) talks about "information poverty" in developing countries. By this he understands the following:

- The "gap" between developing and industrialised countries in the use of information technology;
- No information or incorrect information available to planners with regards to external debt, the performance of public enterprises, natural resources, socio-economic and demographic information;
- The isolation of researchers, scientists, engineers and "other knowledge workers" from international development in their fields of expertise;
- The underutilisation and poor "packaging" of locally produced information; and
- Poor communications infrastructure. "Tokyo alone has more telephones than the whole of Africa" (Hanna, 1991: 10).

The reasons for this state of affairs, according to Hanna, can be attributed to the following:

**Table 3.4**

**Reasons for Information Not Playing an Optimal Role in Development: Some Possible Solutions**

Reasons for failure	Possible solutions
Information not seen as a basic and valuable resource	Information awareness and education programs
Ineffective infrastructures and services responsible for vicious circle	Upgrading of existing infrastructure and service; establishment of new infrastructures and services
Inadequate and inappropriate information technology	Adequate resources for appropriate technology
Lack and shortage of appropriately qualified information workers	Recruitment, appropriate education in information for development
Information services do not meet the needs of people - Western models	Take user need and communication habits into consideration when designing and developing information services for development
Information irrelevant, inappropriate, unadaptable (content and medium)	Value-added information services package information in right form
Information not used optimally	Education for information use
Problems of accessibility to indigenous information	Development of effective access systems
High cost of international information systems	Subsidize
Lack of coordination	Information policy and plan for information for development
Lack of government support for information policy, legal aspects, allocation of resources	Government should recognize its "information responsibility" - informatisation of top managements in government
Lack of macro- (strategic information) and microdata bases (site-specific data bases)	Integrated information development plan by all parties concerned
Lack of appropriate community resource centers (e.g. community information centers)	Creation of rural information infrastructures complementary to established informal information networks
Illiteracy	Information literacy programs, appropriate technology (pictorial information) and programs like easy read for adults

Adapted from Boon (1992: 238)

- Institutional and infrastructural weaknesses. Information is not regarded by policy makers as important;
- Centralised information infrastructures. Information is not user-orientated and flows in one direction only;

- The unwillingness to share information and to protect power bases; and
- Information illiteracy (as a result of poor educational infrastructure).

It is clear that information plays an important part in development. This comes hardly as a surprise: If it is accepted that information is a satisfier of many a basic human need, then it follows that satisfying the need for information must be a priority. It is, however, this quest for information which gives rise to inequalities between nations: the have's versus the have-not's. Many developing countries simply do not have the information infrastructure required for information to play the role that it could. One thinks of library facilities, the media and general availability of information technology as an enabling technology. This phenomenon was explored more fully when the information society was discussed section 3.3.1.

For the decision makers in the development field, information is essential. Without the necessary information to base decisions on, development investments become shots in the dark and could well be the reason for many development project failures. This does not necessarily mean more information; it means the right information for the particular need. It calls for information literacy on the part of government and development agencies.

#### **3.3.4 Ethical issues regarding information**

To resolve moral and ethical conflicts in general, four theories are generally accepted, namely, egoism, natural law, utilitarianism and respect for persons. According to egoism, what is best for a given individual is right. Natural law states that humans have an obligation (i) to promote their own health and life, (ii) to propagate, (iii) to pursue knowledge of the world and of God and (iv) to pursue close relationships with other human beings and to submit to the legitimate authority of the state. Utilitarianism states that those actions doing the most good for the most number of people, are right. Respect for people states that actions are right if everyone adopts a moral rule presupposed by the

action, that is, that people should be treated as an end and not as a means to an end (Dejoie *et al.*, 1991: 1).

It is perhaps the very illusive nature of information which gives rise to many ethical and moral questions regarding its use. Information's potential to provide a base for power, stands first and foremost. In order to obtain such power, people would be willing to behave unethical. Ethical questions regarding information can be dealt with by looking at four aspects: ownership (property), privacy, accuracy and access.

#### **3.3.4.1 Ownership**

The definition of information as information-as-thing implies that it is "something". It then follows that this "something" must belong to someone. Ownership of information becomes very problematic unless it is governed by some or other law. Anyone can freely collect information about anything or anyone, but the question remains: Who owns the information? The person collecting it, or the person of whom the information is collected? To make things worse, on the one hand we have the public's right to know but on the other, the individual's personal right of privacy.

Braunstein (1981: 10) points out that more than one person may own the same "bit" of information and this is the heart of the ownership dilemma. The simultaneity of ownership was identified as an inherent characteristic of information. Where there is a high degree of certainty as to the origin of the information, there may be a chance to prove ownership, but if not, ownership fades away. Mason (1991: 47) points out that whilst it is sometimes extremely costly to produce a piece of information, it is usually very cheap to reproduce that same piece of information and usually without destroying the original.

Based on the work of Snyder, Horton (1979: 10) feels that "any and all data pertaining to our describing an individual is the property of that individual". He also points out that the Swedish Data Act of 1974 demonstrates this view

by treating the misuse of personal information as "data trespass". This may be true for some countries, but, at least in South Africa, personal information is still being traded as normal practice.

An individual can protect intellectual information even though it may be made public, for example, an author publishing a book or a dress designer putting his creation up for sale. Confidentiality is in such cases not an issue any more, but the individual can still protect his interest by means of the copyright act or by registering the design and thereby protecting ownership.

In the process of doing business, the organisation has to divulge information to some of its employees - some employees may even be instrumental in the establishment of such information. The production engineer must know the details of the production process, for example. The law is quite clear on the "ownership" of such information: When the organisation discloses information to its employees so that they can make use of them in doing the job they were hired to do, the company owns such information and may revert to the law to prevent employees from using or disclosing such information.

Although the law provides a certain degree of protection to both the individual and the organisation when it comes to company confidential information and inventions or even suggestions or ideas originating in part or in full from an employee in the course of his duties, such cases could be very complex and proving ownership may be very difficult. Christou (1985: 29) suggests: "All businesses should have a well-defined policy and procedures for the protection of their confidential information, inventions, trade secrets, designs and copyright work. These are highly valuable resources for many kinds of employer...".

However, should the employee acquire expertise or skills while being employed, such expertise and skills would be considered the property of the employee as it is inseparable from the person and is necessary in performing his trade or profession. Inventions made in the course of a person's duties

would be considered the property of the employer, but any inventions made outside the line of duty, would be the person's. In certain cases the employee may have a right to fair compensation from his employer should an invention of "outstanding importance" be made (Christou, 1985: 26).

Organisations can call upon the law when it comes to the protection of trade secrets. There is not a common definition of what a trade secret is, but, at least in the USA, it is done purposely, namely to accommodate new technologies and intellectual endeavours (Relyea, 1986: 46). The purpose of laws for the protection of these trade secrets is so that fair play in business can be enforced. A trade secret is usually information which is not known by people outside the organisation. By contrast, information which is an "open secret", can also be protected by the law, namely by registering the information as a patent. A patent gives the inventor a seventeen year right of exclusive use, after which period it is disclosed (in the USA) (Relyea, 1986: 48).

The allocation of publicly-owned information assets is, in the end, a political decision, particularly if the information is considered close to the personal, national or corporate interests (Horton, 1979: 29). Lewis (1985: 13) agrees with this view: "Questions relating to data protection, computer piracy, transborder data flow, copyright and public/private sector interaction are no longer just professional issues, but matters of national and international governmental concern". When it comes to the disclosure, or not, of scientific and technical information, there is often a conflict between the view of scientists and that of government. Scientists are mostly willing to share their findings with the rest of the scientific world (transborder information flow) but this may lead to problems of national security, especially when it comes to military information. "The government and the research community have struggled with defining the trade-offs between national security and openness in science and technology for much of the post-World War II era. The process of determining an optimal balance between openness and secrecy promises to continue" (Gould, 1986: 79).



### 3.3.4.2 Privacy and secrecy

It has become an acceptable way of life to fill in forms for all sorts of purposes: tax returns, credit applications, student registrations, passport and visum applications, etc. In addition, personal behaviour is being recorded daily in the form of transactions as we use our credit cards, rent a car or board an aeroplane. More alarming is the development of automatic identification of motor car number plates or, potentially, of individuals themselves as they pass through monitoring points thereby keeping accurate details of people's movements.

All of these data bits are entered into computers and when put together, an almost complete file can be compiled on virtually every individual. Normally, all such data would be fragmented as they are being collected by different institutions thereby giving each institution only a part of the total profile of the individual. Combining such data, however, poses a serious threat to one's privacy and "...provides powerful political knowledge for those few who have access to it and control over it" (Mason, 1986: 49).

The right to privacy of personal information of the individual (in the USA) can be traced back to Constitution of the United States and more specifically, in the Bill of Rights, although it is not very specific (Shank, 1986: 7). The recognition of the individuals right to privacy and the violation of which could be made the subject of a lawsuit, was pioneered around 1890 by two Boston lawyers, S.D. Warren and L. D. Brandeis (Shank, 1986: 12). This, together with actions from others, eventually led to the promulgation of acts such as the Privacy Act of 1974 and the Freedom of Information Act of 1966 (in the USA). The Privacy Act prevents Government agencies from disclosing specific categories of information relating to individuals. This put a stop to the general use of the Social Security Number with resulting confusion amongst tax collectors, law enforcement officials, welfare workers and many others who had come to rely on that number. The Freedom of Information Act provides the

public with legal authority and a procedure to obtain records held in agency files.

Similar acts emerged in other countries. Norway (Sweden, according to Cawkell, 1982) created a Data Inspectorate which issues licences before personal data can be used. West Germany has strict standards about protecting personal privacy; individuals may force disclosure of any data held about them and have it corrected, if necessary. Britain has a system of compulsory registration of files containing personal data. People damaged by misuse of data have access to the courts (Tricker, 1982: 188). Similar laws exist in countries such as France, Denmark, Austria and Luxembourg and in 1974 the Council of Europe adopted a resolution similar to the ones adopted in Sweden (Cawkell, 1982: 5). Relyea (1986: 45) sums up the privacy matter: "There can be little doubt that privacy - the autonomous determination of when, how, and to what extent information about oneself is communicated to others - has become an increasingly important and cherished value in American society".

In South Africa a code of conduct for credit bureaus was recently promulgated in the Government Gazette (1994: 38). In this code of conduct credit bureaus are compelled to keep a record of those organisations it supplied information to and to make such information accessible to the individual(s) concerned. Even though the South African law recognises an individual's right to privacy, legislation regarding the right to data privacy is "almost non-existent" (Schultze, 1994: 85). With regards the freedom of information in South Africa, a task force under the Chairmanship of Mojanku Gumbi was announced very recently by the Government to draw up a Freedom of Information Act (Business Day, 19 October 1994). This act supposedly will deal with privacy issues as well as issues relating to the disclosure of certain information. Judging from what appeared in the press it would seem that the emphasis is placed upon disclosure of information relating to companies and government (and presumably TV/broadcasting companies) and less on personal information. The legislation is to be presented during 1995.

Most businesses exist to make profits. In order to achieve that, they collect information relating to its marketplace, its products and its resources. Information can give an organisation a competitive edge over his opponent. "Secrecy....is the soul of business" writes Relyea (1986: 43). It is therefore understandable that businesses devote huge amounts of its resources to secrecy matters. The information must be safeguarded against theft because large amounts of money is spent to collect information by means of market surveys and others. Secrecy is to the organisation what privacy is to the individual although the usage may not be the same.

Not all information which a business may have, can be kept secret. Some information must be made known to its shareholders while other information must be publicised as required by the law. "From this situation there arises a condition of continuous tension as to the kinds and quantities of business information that are provided to government as well as the arrangements under which it is obtained, maintained, and utilized by agencies of the state" (Relyea, 1986: 43). Although the law views an organisation as a "person", the laws for privacy do not apply to the organisation. These laws are reserved for individuals (Relyea, 1986: 45).

Protecting an individual's privacy in respect of data held in electronic form is a complex matter. It is all very well to have laws governing such data, but it is extremely difficult to effectively prevent such data to be transmitted around the world via computer networks in a matter of seconds, in the process making it available to virtually everyone on the network with little or no evidence where it originated from.

Privacy is a basic right a person has (or should have) to have certain aspects of his or her life to be kept confidential. Article 8 of the European Convention on Human Rights declares: "Everyone has the right of respect for his private and family life, his home and his correspondence" (Cawkell, 1982: 4). In a world of miniaturised video and other cameras, microphones and centralised

phone tapping, computers and worldwide networks, protecting privacy is almost impossible to achieve.

### **3.3.4.3 Accuracy**

Collecting personal data is one issue; keeping that data updated in order so that the data is correct at all times, is another, just as serious issue. Arthur R. Miller of the Harvard Law School quotes the FBI's National Crime Information Center (NCIC) which keeps record of all arrests. These records are accessed widely by insurance companies, banks and others. Miller points out that 80% of these records just say "arrested" with neither indication of the crime, nor of the conviction or exoneration. Decisions are often made based on this inadequate and outdated information.

Lyon (1991: 96) quotes the National Security Agency (NSA) in the United States "...one of the most dangerous computer-driven organisations in the World". It operates outside the control of the Senate or the Congress. Although no-one knows what this organisation does, it is suspected that they do all kinds of surveillance and direct spy satellites. Although these examples are from the United States, most countries have similar bodies acting under no control and under a cloud of secrecy and consequently suspicion. All of these examples raise grave concerns over what data is being collected, about whom, but more importantly, how accurate and recent such data is.

The potential danger of out-of-date information about an individual is acknowledged by the law. The California Fair Information Practice Act of 1974 gives a person the right to contest information kept on him in terms of accuracy, completeness, pertinence and timeliness. The Minnesota Privacy Act allows the same (Goldstein and Nolan, 1975: 64). The code of conduct promulgated in the South African Government Gazette (1994: 39) compels credit bureaus to give consumers access to information kept on them and to correct incorrect information. It also governs the periods such information may be kept.

Miller (1991: 127 - 128) pleads for five steps to be taken in order to alleviate the situation. Firstly, he pleads for what he calls "fiduciary obligation - which you can translate into a humanistic notion of good faith, fair dealing - to the data subject". Secondly, that certain information not be collected at all (e.g. religious and political affiliation). Thirdly, the safeguarding of personal data. Fourthly the right of the data subject to have access to his or her own record. Fifthly, he calls for "death to information", meaning that as data gets older and less relevant, it should be purged or archived or even deleted so that it does not "sit there like an informational time bomb" (Miller, 1991: 128).

#### **3.3.4.4 Access**

While it could be disputed whether we are truly living in an information age or whether we are an information society, it can be stated as a fact that one has to have a certain level of computer literacy to survive. Such literacy, according to Mason (1986: 53) lies on three levels:

- One must have the basic skills of reading, writing, reasoning and calculating, that is, the basic intellectual skills to deal with information.
- One must have access to information sources such as libraries, radios, television, telephones and, increasingly, to personal computers in order to access computerised information.
- One must be given access to the information itself.

The first level dealt with is an educational task and is, to a certain extent, available to everyone. The second and third levels are, however, not always affordable to everyone. Even public libraries, hard pressed for funds, are beginning to charge for their services. Access to specialised databases requires firstly, knowledge of their existence and, secondly, the use of specialised equipment (computers and modems). Access to such networks and to the databases could carry a high cost. "Many people cannot or choose not to pay

[these fees] and hence are excluded from participating fully in our society. In effect, they become information 'drop outs' and in the long run will become the source of many social problems" (Mason, 1986: 54).

Access also has another meaning: access by an individual to information kept about such individual. Such an individual is often referred to as the "data subject". The Minnesota Privacy Act, Chapter 479, Section 4 states: "Upon request... an individual shall be informed whether he is the subject of stored data and if so, ...shall be informed of the content and meaning of the data recorded about him or shown the data without any change to him". Likewise, the California Fair Information Practice Act of 1974 states: "Every governmental body maintaining an automated personal data system shall... inform in writing an individual, ...whether he is the subject of data in the system and if so, make such data fully available to the individual in a form comprehensible to him" (Goldstein and Nolan, 1975: 64).

Although there is no formal legislation with regards to data privacy in South Africa, a code of conduct for credit bureaus governs credit information. It forces credit bureaus to disclose information kept on individuals as well as the period such information must be retained (Government Gazette, 1994: 38).

#### **3.3.4.5 Conclusion**

"An abundance of information and data may decidedly be useful in improving life, but it can be equally useful in lessening and threatening our existence", writes Herman J. Saatkamp (Dejoie, 1991: xi). This to a large degree sums up the ethical considerations regarding information. On the one hand, having the technological and intellectual means to collect and disseminate information to each and everyone, is laudable. Being informed as a human being means being in a better position to enjoy and cope with life.

On the other hand though, the same technology and intellect can be put to use in order to exploit information collected for own personal gain. Such usage

would be considered unethical by moral standards. The challenge facing information professionals and lawyers alike, is to create a framework where unethical behaviour is prevented, detected and punished.

### **3.4 Information and the economy**

During the industrial era the economy was dominated by the industrial sector. Not only was the industrial sector sizeable, it had a dominant influence on the other sectors (de Lange *et al.*, 1993: 3). When one sector in the economy of a country becomes so big that it dominates the others, the total economy is then often referred to by this sector.

Thus it is often said that a certain country has an information economy, e.g. the USA (Naisbitt, 1990: 40, 79; Lyon, 1991: 45). This has the implication that the information sector has grown to such an extent that it dominates the other sectors, either in terms of size or in terms of importance. Miles and Robins observe that statements referring to the information economy, information society and information age are usually originating from "interested parties rather than dispassionate social scientists" (Miles and Robins, 1992: 1). It nevertheless warrants a careful investigation of these concepts as there may be some significant trends forthcoming.

#### **3.4.1 The information economy**

The work of economist Fritz Machlup and Marc Uri Porat, starting in the 1960's, indicated that a shift took place from an agricultural through an industrial to what looked to be an information or services based economy. Evidence of this was found in a decline in the number of workers in industrial production and a steady increase in the number of workers handling information in some form or other. This suggested the emergence of a "post-industrial society" and a "post-industrial economy" as Daniel Bell called it in 1976. At that stage it was suggested that a full emergence of a post-industrial society "would be associated with substantial changes in social relations: for

instance, the ownership of capital would no longer be the main source of social power. ...knowledge itself would become the organising principle" (Miles and Robins, 1992: 4 - 5).

In the work done by Machlup in 1962 it was estimated that as much as 29 percent of the Gross National Product of the United States was tied up with the production, processing and distribution of information. The figure, from the work done by Porat in 1977 (1967 according to Lyon, 1991: 10), was estimated to be 46 percent. In addition, it was found that nearly half of the labour force had something to do with information-related work (Meltzer, 1981: 3 - 4). Debons *et al.* (1981: 2) point out that Porat's figures included workers working in organisations which were classified as knowledge or information industries "...regardless of whether the workers were directly involved engaged in handling of data and information...". This criticism is echoed by Lyon (1991: 10) when he points out that because Porat did not use a clear definition of information, the categories are blurred and that, as a result, judges and rent-collectors found themselves in the information category. Miles and Matthews (1992: 93) call this problem the problem of aggregation and point out that whereas the services sector lumps together "a great range of diverse activities", the information sector tried to overcome this, but "...this still involves aggregating very heterogeneous activities together".

Debons (1981: 2) and others published the results of a survey undertaken in 1980 in which they tried, amongst others, to define the information worker more precisely. They found that there were 1.64 million information professionals employed in the United States. Of this figure more than 40% were involved in the computer workfield while 10% came from the library workfield. 1.16 Million of the total number worked in the industrial sector, 370,000 in state and local governments, 78,900 in federal government and 30,100 in colleges and universities (Debons *et al.*, 1981: 10 - 13).

Toffler (1990: 71) made the point in 1990 that the service and "symbolic" (knowledge) activities account for 75% of the work force in the USA. Naisbitt



and Aburdene (1991) seem to pick up a continuing trend in 1991: "The information economy is producing an extraordinary number of well-paying, challenging jobs".

Strassmann (1985: 5 - 6) estimated that "more than 63% of all equivalent working days in the US economy in 1982 was devoted to information work; ...the average weekly workhours expended by information workers is 10% to 20% greater than those put in for other occupational categories", and: "...information workhours becomes greater than 70% of total" workhours recorded, and that at the United States economy spends at least 67% of its labour costs on information work".

The Organisation for Economic Cooperation and Development (OECD) reported in 1981 that Austria, France, Germany, Finland, Japan, Sweden, the USA and the UK were experiencing a "profound change in their occupational structure" (OECD, 1981: 13). They too analysed the information sector in the economy, but try to address the "aggregation problem" (of Miles and Robins) by splitting the information sector into primary and secondary information sectors. The occupations, however, still ranged from bookbinders through sales supervisors, stage directors to metallurgists (Miles and Matthews, 1992: 93).

It is important to note that a shift occurred in the gender of the workforce. Where, in the industrial age, the male (typically uneducated and unskilled) dominated the workforce, this has disappeared in the information economy. Since 1973, the end of the industrial age, real male incomes (in the U.S.) declined until 1985 when it was again at the 1973 level. Women did not suffer the same dip as their male counterparts. This happened because not many women were part of the union-based high-wage phase of the industrial economy. Naisbitt and Aburdene (1991: 38) claim: "...women have taken two-thirds of all the new jobs of the information economy". Bell (1976: xvii) noted that women were provided with a secure base for economic independence for the first time.

The type of work also seem to have changed from the agricultural to the industrial and now to the information economy. Knowledge has become more important than skills or raw, muscular power. As already pointed out, this allowed women and disabled people to join the workforce more than they were able to do in the industrial age. Knowledge workers require a different approach from management and supervision of such workers. Naisbitt and Aburdene argue that it is "...almost impossible to 'supervise' information work" (1991: 198). They point out that "work" changed to what "...goes on in people's heads" (1991: 198). People are being paid for what they know and how they can apply such knowledge.

This emphasis on knowledge led to the concept of "human capital", a term first introduced by Theodore W. Schultz, a Nobel prize winner, in 1961 (Hudson, 1993: 13, Crawford, 1991: 5). He used it in relation to economic growth as a result of improved health, schooling, training and acquisition of information. Later studies undertaken by Paul Romer proposed that human capital must be added to the other main production factors, land, labour and capital (Hudson, 1993: 14). The concept of human capital will be explored more fully when dealing with information and business (section 3.5).

Not everyone agrees that the economy changed that much. Cronin (1985b: 130) warned that the "...picture may ...change". He quotes Naisbitt (*The Year Ahead*) where he claimed that only about 10% of the jobs created in the last 10 years have been high-tech jobs. An analysis by Lyon (1991: 47 - 50) of the information sector and, indeed, the information economy, shows several flaws. Firstly, labour figures do not show up a significant decline in the industrial labour force as such. What did decline was the labour force in the agricultural sector while what grew was the services sector. Services sector does not necessarily mean information sector. Lyon shows that where the identification of the services sector is not a simple matter, identification of the information sector is even more difficult. This point is shared by de Lange (1993: 4 - 5) who points out that even a hamburger vendor can be said to manipulate

symbols in providing a till slip, by Miles and Robins (1992) and Miles and Matthews (1992).

In the second place Lyon points out that the growth in the services sector depended to a large extent upon the manufacturing sector. It could, therefore, not be argued that it was replacing the manufacturing sector. Thirdly, the labour force in the advanced societies is undergoing changes itself. He quotes, like Naisbitt and Aburdene, examples of the growth in women's labour and the informal sector. Lyon (1988: 53) feels that an empirical analysis leads to the "evaporation" of the information sector and concludes that the information economy and information sector are slogans useful to those who want to believe in "the transformative power of technology". He does, however, admit that there is evidence of a marked increase in information activities and in its diversity and that this may have sociological impact.

Bell (1976) who is attributed with the information society concept, pointed out in the foreword to his book that the post-industrial society does not displace the industrial society, "just as an industrial society has not done away with the agrarian sectors of the economy" (1976: xvi). He compares it with the adding of additional layers to existing layers in society, strengthening some features and weakening others. This argument could perhaps be applied to the post-industrial economy also.

Regarding the information sector in South Africa, only a few studies have been undertaken, namely individually by Burger, Zaaiman and Fouché (de Lange *et al.*, 1993: 8 - 9). Burger's study, done in 1981, indicated that there was not yet a significant information sector present in South Africa. Fouché's study of the 1987 census showed a figure of 28% of information workers in the economically active population in comparison to 56% in the USA for the same period. The available statistics on the information sector in South Africa is therefore inadequate to be conclusive. Speculatively, one could argue that there will be a well developed services sector and even an information sector present in the South African economy. However, there is still a very strong

agrarian sector (subsistence economy, mining sector) present in South Africa, but also a strongly developed industrial sector. South Africa therefore is a micro-cosmos of the world economy with elements of developing as well as developed economies present within one country.

The impact of information technology as contributing to the information sector must not be underestimated. It leads back to the concept of Fordism as the era of mass production and consumption when economies of scale in the manufacture of standardised goods became the norm. In the mid-1970's Fordism became destabilised and made way for post-fordism where privatisation and a breakup of the welfare state became the norm. Technology (in general) is seen as the catalyst to help the post-fordism concept along. Developments in information technology made it possible for the microprocessor chip to become a heartland technology; a technology which spans across many products in many sectors thereby reshaping the economy, like the electrical motor has done. (Miles and Robins, 1992: 8 - 13).

Whilst one could argue about the exact numbers in any country, it is evident that a change took place in the composition of economies of most countries, more significantly so in the developed countries. In most countries the services sector certainly grew at the expense of the agrarian and industrial sectors. It is also clear that far more women and disabled people have entered the workforce with much success. This, in itself, is a clear indication that there are plenty of opportunities in the economy where muscular work is not of importance.

The question of an information economy must be left unanswered because of the many shortcomings; the lack of a precise definition and measurement of the information sector being the most problematic one. There can be no doubt, however, that globally speaking, a shift occurred from a manufacturing (industrial) economy to a services dominated (post-industrial) economy. As far as an information sector is concerned, it can be safely said that information sectors are present in many countries, but because of the difficulty in precisely

defining and measuring the information sector, its influence on the economy as a whole and on the other sectors, is still to be proven conclusively. This however, does not reduce the importance of the information activities taking place in countries. Governments and other policy makers must take cognisance of the information sector and its influence on the national and global economies. Individuals must take note of the shift in the economy as far as occupation trends are concerned; the change from physical labour to knowledge workers.

### 3.4.2 The economics of information

There is no doubt that a change took place in the economy and more specifically the driving forces in the economy. Bell (1976) contends that we have evolved from a pre-industrial (agrarian) economy to an industrial economy and are now in a post-industrial economy. The industrial economy was based on machine technology, the aim to fabricate goods (*homo faber*). Industrial goods were produced in discrete, identifiable units and traded, in the process being depleted and used up (e.g. a loaf of bread).

The post-industrial economy is based on services, shaped by intellectual technology. The "good" is knowledge and information; its characteristics vastly different from the good of the industrial economy. It is not used up; once created, it remains available to the producer after being sold. Knowledge is a social product, a collective good, unlike the good of the industrial economy which is a private good.

The economics of information is different from the economics of goods. Scarcity gets a new meaning in the post-industrial economy. Because information plays such a crucial role in the post-industrial economy, it will expand in response to the demand for it. This brings to the fore one of the most fundamental issues in economics: complete information. In classical utility theory it is assumed that complete information is available about goods. With more and more information becoming available, one could argue that this

assumption is (at last) becoming true. Yet, more information does not mean complete information - in fact, more information could well have the precise opposite effect, e.g., by hiding the wanted information in voluminous reports. Information will, paradoxically, remain scarce in the post-industrial economy, data will be abundant. Complete information remains a goal- even in the "Information Age".

Not only will information be scarce, it will become more technical and in order to understand it properly, one will have to have expertise in a number of disciplines. News, for instance, will not only be reported, it will have to be interpreted by specialists.

In order to deal with data from which to extract and distil the required information, another resource become important, namely, time. In the industrial economy, time was a restraint when not enough goods could be produced in a given time frame, or when a machine broke down. Adding capacity in the form of another machine in the production line could easily solve that problem. In the post-industrial age, the problem is more complicated. The (economic) "good" becomes knowledge and information, whilst the "machine" becomes a knowledge worker with a certain knowledge make-up. Adding another human with the same knowledge base may not be possible and time is only available in a limited quantity. Like with any good which is in limited supply, it has a cost.

In order to utilise their own time more optimally, knowledge workers will "outcontract" to others more and more services they could do themselves if they had the time. This has an effect on the people supplying these services in the form of an opportunity. Secondly, in order to have more time available for consumption (to read, to visit friends, to go to the theatre) people will spend less time, for example, on food preparation, with a resulting increase in ready-cooked food, another opportunity in the post-industrial economy.

People will truly become *homo economicus* as far as the utilisation of time goes (Bell, 1976).

This "economics of information" is important to understand. The changes are not limited to the economy only, they have a far more profound effect on society. Society, as Bell points out, consists of the social structure, the polity and culture. The economics of information has implications for all three parts.

### 3.5 Information and business

It was shown that information stands in close relationship with individuals, with society and with the economy. The question is: What is the relationship, if any, between information and the business world? This will be explored by first researching where information entered the business equation. When did it become important? Its relationship will then be explored, including the effect the information has on power bases, its effect on decision-making and, finally, its relationship with company politics.

#### 3.5.1 Historic Perspective

The first people known to record information must have been the Sumerians. The Sumerian priests developed a "...system of writing or recorded data to account for all the transactions entered into" (George 1968: 4). This historic event took place in the year 5000 B.C. The purpose of written documents was for managerial control which seemed, even in those days, impossible without information.

The Egyptians were the next to record information. The building of the pyramids (from 5000 to 525 B.C.) was a great managerial achievement if it is taken into account that one project took twenty years and involved the labour of 100,000 men (George 1968: 4). Every aspect of management as we know it today must have been involved in that project: planning (even long-term planning), organising, control, transportation and the logistics in feeding and

housing the multitude of workers. The Egyptians must have realised the importance of information as can be determined from the writings of Ptahhotep (around 2000 B.C.): "...be calm as thou listenest to what the petitioner has to say" (George 1968: 6). Various other documents of that era point to the necessity of recording information.

It was only in the 1800's when literature on management really started to appear seriously. The literature concentrated on the functions of the manager and of the organisation and information *per sé* received little attention.

One of the earlier managers to acknowledge the importance of information was Daniel C. McCallum (1815-1878) (Wren 1972: 85). He was made General Superintendent of the Erie railway line in 1854. Frequent and accurate reporting was to him, amongst others, essential for good management. He stated five principles of management of which one was: "...information to be obtained through a system of daily reports and checks that will not embarrass principal officers, nor lessen their influence with their subordinates" (Wren 1972: 86). This principle led him to obtain hourly reports on the position of trains, daily reports on passengers and cargo and monthly reports for planning and control. Wren (1972: 87) writes that McCallum "...developed information management to probably the highest state of the art for the times".

Henry Varnum Poor (1812-1905) further enhanced the work of McCallum and stated three principles for good management, namely, organisation, communication and information (Wren 1972: 88). (He must also have been one of the first sellers of information with his "*Manual of Railroads in the United States*", containing financial and operating information about the railroads.) He called information "recorded communication" and advocated the principle of frequent and sound management reporting. Poor pleaded for a systems approach long before Frederic Taylor, for a human approach long before Elton Mayo and for a removal of the formal organisation long before Chris Argyris (Wren 1972: 92). Wren (1972: 92) calls Poor "...one of our most outstanding early contributors to management thought".



Although Charles Babbage (1792-1871) is usually remembered as the father of the first computer, he was also a manager. In 1832 he recommended in his book "...that data obtained as a result of rigid investigation should be utilized in managing an enterprise" (George 1968: 73).

It can be said that Henry Metcalfe practised early information management, perhaps unbeknown to him. Metcalfe was a Captain in the United States Army and the work done by him was recognised by Frederic W. Taylor in acknowledging his debt to him for some of his own ideas (George 1968: 81). Metcalfe promoted and practised the idea of a single source of authority with detailed information flowing back to that source. He disposed of all except the most important and needed reports at the Frankford Arsenal and managed to eliminate "...thirteen different kinds of books and reports that had been in regular use" (George 1968: 82). It would seem from this fact that even in the time of Metcalfe, it was necessary to separate the data from the information and that information overload was already present.

The end of the 1800's and the beginning of the 1900's saw the emergence of the scientific movement with people such as F.W. Taylor, the Gilbreths and Henry L. Gantt. Harrington Emerson (1853-1931) pointed to what could be termed aspects of the management of information in his book "*Efficiency as a Basis for Operation and Wages*", published in 1911. Emerson contended that it was really *ideas* which created wealth and not land, labour or capital (George 1968: 103). (Ideas, as shown in chapter 2, are sources of information.) Emerson listed 12 principles of efficiency and one of these principles mentions information as it is needed for decision making: "Reliable, immediate, accurate, and permanent records - a call for facts upon which to base decisions" (George 1968: 104).

Carl C. Parsons wrote a book in 1918 in which he contended that the heart of the efficiency of the organisation was the office. He realised the importance of information as a basis for good decisions and reckoned that the office is

where all the information was kept in the form of records, reports and statistics (George 1968: 120).

Although it is Ludwig von Bertalanffy who is credited with coining the phrase "general systems theory", Wren (1972: 482) contends that the South-African General, Jan Christian Smuts, first spoke of a holistic view towards form, matter, life and personality. He writes: "Smuts' work represented a Gestalt view of the universe and must be considered as an attempt at what was to become the province of general systems theory".

Norbert Wiener worked on feedback systems and called it "cybernetics" (Wren 1972: 483). His study showed that it was possible for any system to control itself by "feeding back" information through a communications "loop" and thereby adjusting itself. At the same time when Wiener was working on cybernetics, Shannon and Weaver were developing their information theory; the mathematical study of communication. With Bertalanffy's ideas as basis, the economist Kenneth Boulding tried to integrate the theory of cybernetics with the information theory of Shannon and Weaver (Wren 1972: 483). It was only in the 1960's that general systems theory was to make an impact on the theory of management (Wren 1972: 485).

The systems approach seeks to bring the physical, human, and informational aspects of management into "one grand framework of a 'way of thinking' by the manager about how to integrate all facets of the organization into an integrated whole" (Wren 1972: 487).

Wiggins (1986: 41) writes that Bertalanffy considered "biological organisms as open systems interacting with their environment by way of exchange of materials, information and energy". The systems theory led to narrower aspects such as systems analysis in computing. Libraries and information centres are not considered closed systems. "They interact with a range of other systems and sub-systems that are both within and outside their immediate organisation" (Wiggins 1986: 41 - 42).

The systems view of management essentially focuses on the decision making process (Tricker 1982: 22). This is perhaps the first view to point directly to information as a vital aspect of management. Where the classical and the behavioural schools look at the work managers perform and recognise the importance of achieving results through people, the systems approach provides an alternative view, namely by looking at management as the process of using information and of making decisions (Tricker 1976: 68).

Although not the only important task of a manager, a large part of management can be seen as making decisions. For good decisions to be made, information must be present. "Modern executive, medieval farmer and ancient Pharaoh alike need to be informed. Whether launching a new product, ploughing the fields or building a pyramid they want information about the state of their resources and knowledge about the uncertain events they may have to face. Decision making is an information process" (Tricker 1982: 20). "Information has always been crucial to management decision making, and the Egyptian scribe who recorded his master's inventory with a stylus on a clay tablet was a forerunner of the modern information specialist" (Wren 1972: 490). "For as long as men have been striving together to accomplish tasks, making decisions about scarce resources in uncertain situations, management has been practised; and information has been needed" (Tricker 1976: 1).

The trend today in bigger organisations is towards distributed decision making. This means that decisions are made by a number of people, each acting autonomously within his area of responsibility, but working together towards a common goal. Each one of these people has his own perspective of matters and in order to take the decision, these perspectives need to be shared - *perspective taking*, according to Boland (Boland *et al.*, 1992: 1 - 2). For this process to work, perspectives - based on information and knowledge - must be exchanged and therefore put even more emphasis on the importance of information as a basis for decisions.

We can therefore conclude that, although information has not been specifically mentioned by the earlier writers on management thought, its presence was perhaps taken for granted. "Like sunlight to the Victorian botanist, clearly it was crucial to the process, but it was either available, or it was not" (Tricker 1982: 21). Organisations and their executives were perhaps not as pressed for information because of the relative small size and the lack of internationalization. Organisations studied by the management writers in the early days were mostly manufacturing concerns (the Industrial Society) and therefore management thought focused primarily on the production process and its effectiveness. This does not mean that information was not important to early managers. There were just other aspects which were more important at that stage.

Information got more attention as the complexity of organisations grew. Management writers focusing on decision making realised the importance of information and with the emergence of the systems approach, information got its rightful place.

### **3.5.2 Information replacing capital**

As was pointed out in the discussion of the information economy (section 3.4.1), the post-industrial economy is characterised by knowledge replacing capital as the main power base. Toffler (1990: 88) argues that this is already happening. He quotes examples of where information substitutes for high cost of inventory. By using an information system, Merloni Elettrodomestici (a multinational company in Italy) were able to reduce their cost of inventory by 60%. The owner is quoted of saying that less capital is needed to do the same thing as previously. Information can be said to be replacing capital.

A related area where information can be said to replace capital is Just-in-Time (JIT) inventory control systems. JIT means less inventory, shorter delivery times, smaller orders and faster turnaround. To achieve this, information -

precise information - is essential (Toffler, 1990: 123). Again, capital (locked up in inventory) is replaced by information.

Whereas fordism was concerned with mass production and mass consumption, post-fordism was characterised with a high variety of products and customisation of products to suit individual needs and tastes (Miles and Robins, 1992: 12 - 13). Such an environment in the fordism sense would require high infrastructural capital and running cost outlays, usually making such a venture completely unfeasible. Through the use of information, knowing the needs and tastes of customers, where geographically the products are needed, what the inventory levels are at different warehouses and through the use of computer controlled production floors, such an environment in post-fordism sense does become feasible. The cost of diversity is therefore driven towards zero (Toffler, 1990: 87).

Our knowledge of materials and their physical attributes allow us to build machines that defy the hostile environment of outer space, or design tennis rackets and racing bicycles or fibre optical cables to transmit thousands of data bits simultaneously. In some cases earlier materials would preclude us from achieving it at all and where it would be possible with such materials, the cost would be prohibitive (while being far inferior in quality) for example, using copper wire to achieve the same throughput as with fibre optic cable. Knowledge made it possible; knowledge acquired over many years by documenting current knowledge and expanding it further generation after generation.

Toffler (1990: 88) also reminds us that knowledge saves mightily on time, one of the most important resources in the post-industrial age and in terms of storage space in warehouses and elsewhere.

Cronin (1985b: 129) remarked that information must be seen as a social and economic "lubricant"; one which conserves other resources. This is perhaps what this is all about. Whilst it could be argued against the notion that

information and knowledge *replace* other resources (at least not directly), it must be clear that information is most definitely contributing towards the more effective utilisation of other resources, thereby *conserving* them. Efficiency and effectiveness in the utilisation of other resources is what information is all about. The efficiency in collecting such information contributes directly to the "bottom line".

This makes information and knowledge and, very importantly, the efficiency of obtaining such information, very important to business. Anything that contributes towards more effective and efficient utilisation of other resources and increase productivity, must be taken seriously by business. Information is such a resource.

### 3.5.3 Information and human capital

"Human capital" is a term which evolved out of the work of Theodore W. Schultz in 1961 (Crawford, 1991: 5). Schultz was studying mainly economies of the low-income countries and got to the conclusion that the welfare of poor people did not happen as a result of improvements in the production of space, energy or cropland but through the improvement in the population quality and advances in knowledge (Hudson, 1993: 13). What was needed was child care, home and work experience and the acquisition of knowledge through training and schooling. This concept he called human capital; the accumulation of knowledge. Stewart (1991: 42) says: "It is the sum of everything everybody in your company knows that gives you a competitive edge in the marketplace".

Although the term "capital" is usually associated with money, it does not have to be. Webster's Dictionary (in Crawford, 1991: 10) defines capital as "any form of wealth employed for the production of more wealth". A medical doctor or professor's knowledge produce wealth for them in the form of a substantial income and could therefore be considered as capital. Japan is a classical example of how an economy can be built on human capital. Their

investment in high levels of education and through hard work enabled one of the highest growth rates (Crawford, 1991: 24 - 25).

Paul Romer proposed that human capital be added to the other three factors of production, namely, land, labour and capital. In his opinion, human capital could be measured by the number of years of education and ideas through the number of patents (Hudson, 1993: 14). Hudson proposes the term intellectual capital rather than human capital, the difference being that human capital is aimed at entire populations while intellectual capital is aimed at the individual.

Human capital and intellectual capital are therefore terms used to denote the "capital" locked up in and gained through education, training and experience. The more intellectual capital an individual has, the bigger his potential to contribute and the more human capital a country possesses, the higher the standard of living should be. This was proven by a study done in the USA in 1980 when it was found that men with post graduate educations were earning 130% more than those who never finished high school (Stewart, 1994: 28).

Hudson (1993: 15) warns that the concept of intellectual capital must not be "intellect as pure intellect" but that it should have a degree of "intellect in action". The aim is therefore not only to obtain intellectual capital, but to make it productive through action. This is an important principle for information management, as will be shown later. It also relates strongly back to the purpose of information as described in chapter 2.

As human capital and intellectual capital increase, so does the ability to generate information (or data to be more exact). It is the countries where educational levels are far higher than others where the most publications are produced. It is also those countries where business executives and others are complaining about information overload.

Clearly, human capital and intellectual capital are directly related to a company's human resources. Because it is locked up inside the human brain,

it can only be intangible. Most companies will agree that its human capital is one of the biggest assets of the company - that without it, the company will come to a grinding halt. However, with possibly the exception of patents licensing or capitalised research, it is not found where all the others assets are reported on, namely, in the balance sheet.

The link between human capital and information is clear. Learning and experience takes place through having the raw material - information - available. But it is not a case of the more information, the more human capital. One has to be selective when providing the information needed to create knowledge.

The concept of human capital has huge implications for business. With the increased emphasis on knowledge as a major "production factor", businesses have to rethink their investment patterns and decisions. The workforce will undergo change as women and minorities gain acceptance because of the fact that physical strength is not required in many cases. The organisation evolves from a pyramid to a living organism (Crawford, 1991: 113).

#### **3.5.4 Information and power**

According to Follet (in Tricker, 1982: 39), power is the ability to make things happen. This definition implies two concepts:

- Power "over" people. This is the case where people do something they do not really want to do but do it nevertheless out of fear of punishment, penalty or non-reward. Griffin (1987: 422) calls this coercive power.
- Power "with" people. In this case, power is not based on fear, but instead, things are made to happen by setting goals, making plans and achieving objectives with others. People are made to do things by controlling the way they interpret messages and by acknowledging their world, needs and situation.



In primitive societies the tribal leaders, witch doctors and priests had power over the people because they had access to information not available to the others (at least that is what the other people believed). This information was passed on from generation to generation with due ceremony and great care. This is how they managed to retain their power base.

Tricker (1982: 38) notes how interesting it is to observe how insurgents today seize the local television station and airport before they occupy the government buildings or the royal palace. "Consequently, power resides in the capacity to deprive people of information that would give rise to challenge or criticism" (Tricker, 1982: 39). Depriving people of information or selectively letting them have the information suiting your needs is one sure way of staying in power. The battle, almost to the point of taking up weapons, between the previous South African government and an opposing political party's radio sender, Radio Pretoria, is another case in point.

The trend towards participative management found in organisations today, attacks the root of managerial authority. The union movements demand more information from managers about resources, results, prices, profits, etc. Likewise, consumer groups, customers and supply organisations demand more information. It is evident that union movements are scoring more and more successes at least in terms of wage disputes as their power base expands. Andrews (1987: 18) says the following about the assumption that only the people "at the top" knew what is going on: "...that has changed now because the organisation down here also has access to that information. People don't follow instructions any more. You can't tell them what to do any more, they need to understand what you are doing before they will listen".

Fundamental to this is information. We are told that we live in an "information" world (Toffler, 1979: 137; Sunter, 1987: 38; Cawkell, 1986: 92) and in such a world, information "...is not merely incidental to the exercise of power but is itself a basic source of power" (Tricker, 1982: 39). Naisbitt (in Dejoie *et al.*, 1991: 59) writes: "the new source of power is not money in the hands

of a few but information in the hands of many". Cawkell (1986: 94) points out that the majority of people seem to be unconcerned about the fact that information gives the possessors power over them and writes: "The information haves will accumulate more power, a trend which is unlikely to be arrested".

The American Civil liberties Union Foundation (in Horton, 1979: 253) has this to say on information as a basis of power: "The principal commodity of power in our society is information. Power may come out of the barrel of a gun, but far more power comes out of a computer or a data bank, particularly if the information in it relates to people who do not know that it has been collected or cannot challenge its accuracy or use".

Touraine (in Tricker, 1982: 40) summarizes it: "The principle opposition between ...classes does not result from the fact that one possesses wealth and property and the other does not. It comes about because the dominant classes dispose of knowledge and control information" (Tricker, 1982: 40).

The other side of the coin is that with mass media within range of virtually every citizen, control of information becomes more difficult to those wanting to hijack it. Naisbitt and Aburdene (1991: 281) acknowledge the power that information gives people but write: "There are fewer dictators on the planet today because they can no longer control information". They base this argument on the availability of information to everyone because of global television and video cassettes Davenport *et al.*, (1992: 53) point out that more than just putting in technology or information management practises are needed to get information to become freely available through the organisation. They use the term "information politics" and contend that these politics must be properly managed for information flow to occur. They write: "Information may flow like water, but in the real world even water doesn't flow without political assistance" (Davenport *et al.*, 1992: 56). One reason for the reluctance on the part of people to give up "their" information is the power they have by having the information exclusively. It is to be naive to expect people to part

with such information. See also section 3.5.7 for a discussion on information politics.

Boland (1987: 372) calls the notion that information is power, a "fallacy". He argues that power is not an entity to be "molded, shaped, redistributed and possessed as if it were a three-dimensional object". Power, according to him is a relationship between people and each party to this relationship has access to power over the relationship. It comes about through dialogue and interactions. Information in itself, therefore, does not have power - it is what a person do with such information and how he does it, that may or may not give him power.

There can be little doubt that having the "right" information available exclusively, puts a person at a distinct advantage, provided, of course, as Boland suggests, such a person makes use of such information in his interaction with others. It is on this premise that the notion that information is power is built. This is and will remain a fact and because this, people will continue to keep important information to themselves. However, it becomes more and more difficult to collect and keep information exclusive to oneself. Even businesses and especially businesses, are guarding their information closely in order to gain a competitive edge over their opposition. The same is true of people in their business, but also their social, life.

### **3.5.5 Information and decision-making**

The model for the decision making process, described by Simon (in Radford 1981: 10), consists of three stages as follows:

- Intelligence. The problem is defined by searching the internal and external environments of the decision maker and information is gathered.
- Design. The various possible solutions to the problem are identified and analyzed.

- Choice. One of the possibilities is selected on the basis of an evaluation of its effectiveness relative to achieving the objectives.

To make the decision, an iterative process may have to be used.

All three stages require information to be available. Without information the decision can be made, but the effectiveness of the decision will be doubtful. "One of the most important components of the decision-making process is the gathering of information from which an appreciation of the decision situation can be made" (Radford 1981: 1).

Decisions in an organisation are made at three levels, namely, at the strategic, managerial or operational decision-making levels (Tricker, 1982: 36). On the strategic level, decisions are aimed at the longer term direction of the enterprise and its interaction with the outside world. Decisions on the managerial level concern themselves with technical and control decisions and where the allocation of resources is decided within overall strategies. The operational level of decision-making concerns itself with decisions necessary to execute managerial requirements.

The type of decision varies from the one level to the next. Many decisions on the operational level are programmable whereas the decisions on the strategic level are of a creative nature. Likewise, the time horizons change from level to level. The decision maker on the strategic level deals with great uncertainty. "The challenge is to identify the uncertain future" (Tricker, 1982: 37).

It is clear that the information needed to make the decisions varies from the one to the next level. The information needs of the executive making strategic decisions and which frequently involves a creative process, is a very unique one. The decision-maker has to merge two, or more, self-consistent "frames of reference" to create new insights and therefore new information. Tricker quotes the example where the executive has to combine information he once read in the Financial Times with something that he remembered a colleague

once said to obtain new insight into a problem or for a new opportunity to be explored. It captures what might be called the "a-ha" effect (Tricker, 1982: 37).

The decision-making model of intelligence-design-choice has the appearance of a simplification of the decision-making process. The classical decision theory rests on the assumption that all the necessary information is available to the decision maker; hence, the availability of *perfect* information, or complete information. Boland (1987: 375) calls the notion of perfect information (another) fantasy and writes: "Perfect information is a description of the 'true' form of nature - an unattainable, transcendental ideal". Moreover, the classical decision theory assumes complete information regarding all possible alternatives, that decision makers have a rational systems for ordering preferences in a hierarchy of importance and that the goal is always to obtain maximum payoff (Griffin, 1987: 207). In most cases in the business world, this is not the case leading to situations where decisions have to be taken with imperfect information. This calls for another process: thinking, or even better, creative thinking; making informed decisions with the available information, well knowing that it is not perfect information. This concept was called satisficing by Simon and plays an important role in decision making (Griffin, 1987: 209).

The behavioural decision theory assumes that decision makers do not have complete information regarding the situation, that they do not have complete information regarding the alternatives and that they are unwilling or unable, or both, to fully anticipate the consequences of each alternative. The third theory is called irrational decision theory and, different from the other two (classical and behavioural) which assume rationality, it assumes that most decision makers are irrational in their decision making. This was postulated by Soelberg (in Griffin, 1987: 209).

Paradoxically, more information thrown into the decision making model does not lead to less thinking. "On the contrary, the need for thinking becomes

greater and greater because we have to make sense of the information" (De Bono, 1992: 24). Also, more information does not necessarily contribute to the creation of new ideas. Less information could, in fact, be more conducive to creativity than a lot of it, because it forces the person to think very creatively with the information he does have available. De Bono calls this the value of "innocence" (1992: 29 and 43).

This leads to a serious dilemma. It is generally assumed that more (let alone perfect) information will lead to more informed decisions, that is, better decisions. But there are examples abound where less information leads to very creative decisions or ideas. De Bono (1992: 29) suggests that the reason for this lies in the fact that "information rarely comes as information. Usually the information comes wrapped in concepts and perceptions". This points not only to receiving un-pure data, that is, data already clouded by perceptions, or attaching own perceptions to pure data. The solution lies in getting the "right" information as input into the decision making process; not necessarily "more" information. The process of collecting information in order to take a decision is therefore very important.

Hence, it is not only important for the manager to have information at his disposal, the manager must decide beforehand what information he needs. Tricker (1982: 25) reckons this to represent a new, and crucial, management task. The manager must identify, understand and determine his information needs.

The challenge to computer systems developers is to develop information systems that merge information originating from more than one plane. According to Tricker (1982:37) efforts so far have tended to concentrate on single planes. One must be careful, though, not to fall into the trap of believing that an information system produces information. Information is obtained when data is put into perspective and context and no information system can do that. Boland (1987: 366) speaks about information without *in*-formation. By this he means that structured data is not yet information; it

needs dialogue in order to obtain meaning and only then can one talk about information. There is, therefore, a human side to information systems which, if ignored, could have a detrimental effect on the effectiveness of the system.

De Bono (1992: 24 and further) shows that there is more than one way of looking at data. Two people may have exactly the same data and yet, they may draw two different conclusions. One person may, for instance, use the data to confirm what he already believes ("what is"); someone else may use the very same data and come up with something new ("what could be"). Sometimes the concept comes before the data, other times the data comes before the concept. The outcome could be vastly different depending on the choice.

Decision making cannot happen successfully without information. Information is integral to the process of making a decision or solving a problem. However, it is a fallacy to argue that the more information, the better decision. Simply more information does not necessarily lead to better decisions. Better decisions need relevant and timeous information rather than more information. In order to have relevant information, the decision maker must be selective in the process of collecting or generating information. This poses a challenge to decision makers: To make a conscious effort to resist the temptation to collect more and more information and to concentrate of collecting only relevant information.

### **3.5.6 Information and innovation**

There seems to be a special relationship between the ability of a business to be innovative and its use of information. Research done by Henderson and Cockburn showed that successful pharmaceutical companies were able to "...foster a high level of specialized knowledge within an organization, while preventing that information from becoming embedded in such a way that it permanently fixes the organization in the past, unable to respond to an ever-changing competitive environment" (Henderson,1994: 100).

She points out that a pharmaceutical company is bombarded with information coming from different disciplines internally and externally to the company. Large numbers of scientists are continuously doing research on a wide variety of rapidly advancing disciplines. As an example, she quotes the field of cardiovascular research where, during the last half of 1992, 80,000 articles were published. Apart from hiring the best people in their respective fields and managing them effectively, success came because management was able to manage the companies' knowledge and resources.

Henderson's research showed that the successful companies firstly kept their scientists closely connected to the scientific community at large. This, however, did not guarantee success; the danger is that a company may have the best scientists, but if such knowledge is not applied properly, it is wasted in organisational terms. Secondly, the companies allocated scarce resources effectively so that debate was stimulated and information was transferred. "Our results suggest that the companies that take advantage of knowledge generated from all areas of the organization are significantly more productive than their rivals" (Henderson, 1994: 104). This shows that information has to be shared in order to be effective.

Innovation is essential in today's world. Very successful companies of the past have fallen behind the younger and more innovative ones. One thinks of companies such as IBM, DEC and General Motors (Henderson, 1994: 100) and successes of companies such as MicroSoft. The research of Henderson points clearly to effective information and knowledge management, amongst others, to enable the company to be innovative.

### **3.5.7 Information and organisational politics**

Davenport *et al.*, (1992) use the term information politics to refer to the power play one is likely to find in any organisation as a result of the unique information people have. Attempts to implement information management or to become information-based companies have failed in many organisations



studied by Davenport and his colleagues because, in their views, the politics of information was not properly managed.

They found that the bigger the emphasis placed by the organisation on information, the less people are likely to share it. Five models of information politics are defined by Davenport and his colleagues (1992: 55):

- **Technocratic Utopianism.** This is found where a strong emphasis is placed upon technology. Usually driven by the information systems department, the aim is to provide technology to each and every desktop so that information can be delivered instantaneously. The information itself and its contents are often given little or no attention. In this model it is believed (by the technocrats) that those having information of value will share it willingly with others; from there the expression "Utopia".
- **Anarchy.** Organisations fitting this model have no prevailing political information model and exist in a state of anarchy. It usually happens where no key executive realises the value of common information and everyone is allowed to keep his own information.
- **Feudalism.** This model was encountered most by the researchers. In this model each key executive control the information within his area of responsibility. In this model it is extremely difficult for the central authority to make informed decisions for the common good.
- **Monarchy.** In this model power is centralised in one person; either the CEO or someone empowered by him.
- **Federalism.** This is the preferred model, according to the research of Davenport and colleagues. It treats information politics as natural and legitimate and let people with different interests work out between themselves something acceptable to all.

It is suggested that an organisation first determine the model applicable to it, then to select the model it ideally wants, taking its culture into account. They recommend only two models found to be viable, namely, monarchy and federalism. Federalism is more difficult to implement as it relies on the cooperation of its employees to willingly share information. For this reason monarchy is easier and can be just as effective (Davenport *et al.*, 1992: 60).

Davenport and his colleagues make a very valuable contribution towards understanding how information is treated by both employees and the organisation. It is naive to expect managers and other users of information to suddenly start sharing information willingly based on a few policy and procedural statements. The reason for this relates back to the information-is-power concept or, as Davenport and his colleagues (1992: 54) state so elegantly: "One reason the stakes are so high in information politics is that more than information is at stake".

The politics surrounding information will be revisited when information management is addressed in chapter 4.

### **3.6 Information in national context**

#### **3.6.1 Information and forms of Government**

Control over information by the State puts it in a powerful position. Should the ruling government take the form of an autocracy, it would be important for the state to control information strictly. Only information favouring such a government would be disseminated to citizens. In this regard information technology could play a strategic role. In this regard, Lyon (1991: 95) quotes South Africa as an example. He refers to the pass law system which, without technology, the "...white minority government could not keep track of black employment and housing without the [IBM based] automated system". With the right technology, the state has the infrastructure needed to record all sorts of personal information regarding its citizens so that surveillance becomes a

reality. The linking of all the different bits of data contained in many different data bases, both those of the state and private ones, would indeed put a state in a very powerful position, a position which could easily be put to use for political gain. Most governments have the infrastructure needed to accomplish this kind of "electronic surveillance" systems already in place, for example, (West) Germany with their computer readable identity card system, the United Kingdom with electronic surveillance of motor car licence plates and the National Security Agency in the USA (Lyon, 1991: 95 - 96). These are only examples - some with legitimate applications - but with the potential of "Big Brother" watching over citizens.

The last decade saw a demise of socialism with the dramatic fall of the soviet republics as the stronghold. Naisbitt and Aburdene (1990: 77) argue that this demise can be attributed to (i) the global economic forces at work (insustainability of a closed, self-sufficient economy), (ii) technology as an enabler for the global economy and (iii) the failure of a centrally planned economy to make way for decentralisation and market-driven entrepreneurship. In addition, an contrast to earlier times, the individual has become much more important; a focus away from the state to the individual. This was acknowledged by the Soviet Union in its acceptance of *glasnost* which is nothing other than openness and transparency; a free flow of information and communication.

The opening up of communication channels via television, the printed media and, in general, freedom of speech cannot be underestimated. The wide-spread use of technology has empowered individuals: "Computers, cellular phones, and fax machines empower individuals, rather than oppress them, as previously feared" (Naisbitt and Aburdene, 1990: 281). Global television networks such as CNN make people aware of what is happening elsewhere. This access to "foreign" information coming in via transborder television, lead to the demise of East Germany. In Poland the state tried to suppress the use of satellite dishes using feeble arguments relating to the environment ("...the landscape has to be preserved"), but satellite dish companies cannot keep up with the demand

(Naisbitt and Aburdene, 1990: 96). People want information and they will not be stopped in their quests for it.

On the other hand, the State could go a long way in obtaining understanding from its citizens by sharing information with them. It could even allow them to participate or, at least, to influence decision making through interactive cable television, called push-button polling or the "electronic town hall". The Canadian parliament broadcasts press conferences and committee hearings over 104 television channels (Lyon, 1991: 88) while the House of Lords in London and the House of Representatives in the U.S. are covered by TV (Lyon, 1991: 91). It is possible to send hard copy letters through CompuServe or the InterNet, two of many global electronic networks, to members of the US Senate, the U.S. House of Representatives, the Vice President or the President. These are all examples of how the state can use technology to disseminate information to and solicit opinions from its citizens.

Technology enables participation. The prophets of the information society see a society being given a wider choice regarding politics and participation in decision making nationally (Lyon, 1991: 12). With the use of information technology, citizens could participate almost instantaneously in decisions affecting them (Lyon, 1991: 86). This electronic recording of opinions and even votes, however, has a serious ethical implication and raises many moral questions as to privacy, ownership and other issues as discussed earlier.

The change from autocratic forms of government to focus on the individual, its rights and its participation in the governance of the nation, is facilitated by information technology and its ability to let information flow freely. Without modern technology such as real-time television from around the globe, computers and computer networks (data highways), cellular phones and fax machines, empowerment of the individual would have been much more difficult, if not impossible. Once again, information helps to shape the world and how we, as society, are living and being governed in it.

### **3.6.2 National information policies**

It has been shown that information is an important resource to individuals, to business and in a national context. If the effect of information activities on national economies, human development and society as a whole is considered, the need for a national information policy becomes evident. If that is accepted as a point of departure, it is only logical to expect the collection, utilisation and dissemination to be guided by policy frameworks. This would not only be true at a national level, but it should be true for any business, that is, a business information policy.

In practice, however, information policies, whether on national or organisational level, are not often found, at least not in a single policy document. Even in the literature one does not find much with regard to it. Reasons for this phenomenon will be explored later.

Because information covers a broad range of subjects, it should not come as a surprise that an information policy covers a wide range of subjects; from telecommunications to journalism (Rosenberg, 1982: 3). Government itself is probably the biggest collector of information and provider of information services in any country and with the many different government departments and agencies, the possibility of duplication is very real. Overlap with the private sector is also possible. The developments in information technology made data storage easily accomplished with the resulting danger of a proliferation of data simply because it is possible to do so. It also brings another danger, namely, the danger of such information being incorrect, out of date and of falling into the wrong hands. All of this emphasises the importance of information policies. It is not a luxury, but a necessity.

According to Rosenberg (1982: 8 and further) an information policy should address at least the following issues:

- Public sector vs. private sector issues

The rationale here is that the policy should be governed by the principle that it is more important for the public to have access to information sources than for a private enterprise to profit from it. The access should ideally be free because the taxpayer paid in the first instance for the information to be collected, generated and processed and should therefore not have to pay again for obtaining it (Rosenberg, 1982: 8 - 9).

The debate of having to pay for membership of public libraries in some towns in South Africa is a case in point. If Rosenberg's principle is used, membership should be free to all ratepayers seeing that public funds have been used to establish the library in the first place.

- Government restraint on scientific publication

Some scientific publications (research) contain information that may pose a threat to the security of the state. Scientists usually want to publish their research in the name of science, whereas government would be more selective in what gets published. The National Security Agency in the USA requested scientists working on cryptography to submit publications to them first before publication. This censorship does not sit well with values such as transparency and even democracy and, unless resolved in an information policy, will cause constant tension between science and government.

(It is interesting to note this tension between science and government as a forecast of Daniel Bell (1976) come true. These two are two "situses" identified by Bell to lead to tension and conflict.)

- Privacy

The issue of privacy was discussed extensively in section 3.3.4.2 where the dangers were pointed out. The information policy should address this issue.

- Ownership

This issue was also discussed in section 3.3.4.1.

(Rosenberg, 1982: 8 - 11)

Harfoush and Wild (1994: 11), in their proposal for an information policy for South Africa, suggest that an information policy should have the following characteristics:

- It must fit within the overall policy framework defined by the government;
- It must serve government and local communities alike, so "...as to enable the development process to be driven by the needs of communities rather than the needs of the bureaucratic system" (Harfoush *et al.*, 1994: 11); and
- It must respect the rights of individuals.

Transborder data flows need special attention in an information policy. It is not only financial transactions flowing from country to country, it is also scientific data being exchanged via networks (making censorship unfeasible). Television coverage to other countries would also fall in this category and already countries are taking precautions to protect culture. France limited the use of American music on their radio stations and in Britain state-run TV stations may only broadcast 14 per cent non-EEC material (Lyon, 1991: 128). This is something that needs to be spelled out in a national information policy.

Again, this issue has the potential of conflict between government (control motivated) and private enterprise (profit motivated).

Hanna (1991: 42) (with the emphasis on information technology in developing countries) suggests that an information policy should address the following:

- Trade, investment, industrial and regulatory policies with regards to information technology and information. A balance must be maintained between the protection of the local informatics sector and making use of what is available on the international markets.
- Setting priorities. It is obvious that limited resources will make it impossible to address or achieve everything at once and therefore an information policy must be clear on what and where the priorities are. The priorities must be driven by demand and not by technology itself.
- The role and effect of information technology on education, training and employment. The issues of people being replaced by technology, but also the need for skills as a result of the introduction of information technology, must be addressed.
- Socio-political issues such as equitable access to information, the effect of foreign media on local cultures, privacy and ownership and the role of information in development.
- The role and function of government as a major user of information and information technology.
- International issues, for example, transborder data flow and the role of international donors and development agencies.

According to Rosenberg (1982: 16 *et seq.*) France, the UK and the USA have advanced far with the development of information policies. In the French



"plan", cognisance was given to the decrease in industry-related employment and the growth in intellectual jobs and the predicted increase in home-based work and they decided on a strategy conducive to access to information to everyone. They consequently decided to concentrate on computer networks. This they called the democratisation of information. Education was seen to play a major role (Glastonbury and LaMendola, 1992: 183 - 184).

The Japanese accepted an Information Society Plan in 1972 having the following major objectives:

- To promote knowledge industries over smokestack industries;
- To develop solutions to the problems of industrial age industry; and
- To focus upon software rather than hardware solutions (Glastonbury and Lamendola, 1992: 182).

Canada concentrated more on information technology in their policy because of its vulnerable position regarding technology and the influence of the US mass media on their culture. Brazil is quoted as having advanced the furthest of all third world countries (Rosenberg, 1982).

South Africa does not yet have a national information policy. The first efforts in this regard are found in the work done by the National Advisory Council for Libraries and Information (NACLI) in 1986 (Pauw *et al.*, 1986). (NACLI was established by the Cabinet in 1982 and reported to the Minister of Education.) They produced a report on the structure of the South African system of Libraries and Information (SASBI) and in the report referred to the necessity for a national policy on information.

In 1993 the International Development Research Centre in Canada undertook a study in South Africa to, *inter alia*, propose a framework for the development

of a national information policy. Their studies culminated in the report by Harfoush and Wild (1994).

There can be little doubt about the relevance and importance of a national information policy for any country. Yet, it is not found easily. Harfoush and Wild (1994: 12) list the following problem areas in South Africa:

- Information fragmentation. This may be a South Africa specific problem with the many homelands, independent States and lack of centralised data bases;
- Lack of coordination, and
- Lack of information culture in government.

The influence and effect of information and information technology on individuals, communities, the economy, society and on a nation, is too far-reaching to be left to chance. Every business should have an information policy and every country should have one.

### **3.6.3 An Information Bill of Rights**

The integral part information plays in individual human life, in society, in the economy, particularly in development and in national regard was pointed out in the foregoing sections. The ethical issues attached to information and information technology and in particular, the possibilities of it being used to further inequalities and a proliferation of the gap between the information rich and the information poor, prompted Glastonbury and Lamendola (1992: 187) to propose an [Information] Bill of Rights.

They base their Bill of Rights on the following "priorities":

- Social, historical, cultural and ethical factors must dictate the introduction and development of information technology. The emphasis must clearly be on what information technology can do for people and not the other way round.
- Information technology developments must be assessed for their potential impact on democratic principles and individual freedom. This clearly points to the fact that information and information technology can contribute to both democracy and autocracy.
- An agenda is necessary to identify and guide the characteristics of emerging societies (be they information, post-modern, industrial or whatever societies) using information technology.
- The application of information technologies cannot be left to be determined by market forces, commercialism or material interests, but must be guided by conscious human choices. This emphasises the potential threat to individualism by technological determinism.
- The "direct and side-effects" information technology use must be considered, that is, choices made have benefits and costs and both should be considered. Those who will benefit, but also those who will loose because of choices to the use of technology, must be weighed up before embarking on a road.
- Information technology and systems must be scrutinised for their effect on discrimination; racial, gender and disability.
- Information technology must be de-mystified by the use of everyday language(s) in documents. Guidelines must be written accurately and clearly for everyone to understand.
- National information technology plans and policies must be established.

- Technology transfer (through development aid) must be guided by a "sympathetic framework of open technology transfer" and not through market exploitation.
- It must be recognised that although there are global principles and priorities with regards to information technology and its application, there are also equally important local, personal, family and community principles and priorities to take into consideration.

(Glastonbury and Lamendola, 1992: 188 - 191)

Based on the above, they propose a Bill of Rights of 15 statements.

Du Plooy and Roode (1993: 18) contend that the Bill of Rights of Glastonbury and Lamendola has been developed from a first world perspective and should be expanded to make it applicable to developing countries too. In a later article by the same two authors, they argue why a Bill of Rights for developing countries should be different from one for developed countries (Roode *et al.*, 1994: 11). They propose an additional nine clauses to the Bill. These clauses concentrate on the role developed countries play in developing countries and suggest guiding principles for the relationships between such countries, as follows:

- Assisting developing countries to establish ethical checks and balances regarding their information technology industry;
- The willingness by developed countries to share of information with developing countries;
- The willingness by developed countries to assist developing countries in education and training and appropriate technology transfer by adapting it to local situations and in a responsible manner;
- There must be a "good fit" between technology and culture;

- Fundamental human needs should be the driving force behind the introduction of information technology;
- Developed countries will not withhold training and experience opportunities from developing countries;
- IT will not be promoted as a panacea for all problems of organisations and societies;
- The application of IT in underdeveloped countries shall be guided by the tenet that economic and socio-economic development go hand-in-hand; and
- All developing countries should have an appropriate national information technology policy.

(Du Plooy *et al.*, 1993: 18 - 20 and Roode *et al.*, 1994: 12 - 16).

Postman (1992: 20) coined the term "technopoly": A state of affairs where technology "rules" and is based upon the belief that the highest goal of human labour and thought is efficiency. Technopoly is where all forms of culture and economic development submit to the sovereignty of technique and technology. Hence the human is moved into the background and technical calculations become superior to human judgement. This kind of argument leads to a form of technological Utopianism "...which holds that the best way to attack and solve problems, ...is by applying yet more (and ever more complex) technology" (Roode *et al.*, 1994: 3).

It would seem that there is not many differences between what could be described in a national information policy and what could be described as a Bill of Rights. A Bill of Rights defines the departure point for a national information policy to be written, but it could be implicit in the policy. A Bill of Rights does give citizens some legal grounds to fall back on whereas a policy does not. It is of course possible that some other laws could protect the

same. For instance, the USA does not have an information Bill of Rights, but it does have laws such as the Privacy Act and the Freedom of Information Act to protect citizens against privacy and ownership/accuracy issues.

Developing countries would possibly be better off should they have a Bill of Rights. It is therefore dependent on the particular country's circumstances what form of protection would be more appropriate. What is important is not necessarily which one is chosen; what is important is that some form of protection exists.

### 3.7 Information in global context

On the global level, it is evident that some countries have advanced much further than others with respect to the use of information technology up to the point where one could possibly talk about an information society, or, at least, of the wide use of information technology by society at large. On the other hand, it is far from being a global phenomenon if one considers the third world and the role information technology plays there although much information technology manufacturing flowed over to some previously developing countries (e.g. Taiwan and Korea), now called Newly Industrialised Countries (NIC's). Bessant (1987) calls this phenomenon the North-South Divide, characterised by a concentration of knowledge and information in the Northern hemisphere and by technology and capital goods flowing in one direction.

Competing globally means using modern technology, particularly those technologies used to process information with. The world is indeed "shrinking" in terms of communication. In 1988 the first fibre optic cable bridged the Atlantic ocean enabling 40,000 simultaneous calls via the one cable; in 1989 the Pacific was bridged when the U.S. and Japan were linked by optical cable. These are the cornerstones of what Naisbitt and Aburdene call "an international information highway" (Naisbitt and Aburdene, 1991: 14). Add to this the numerous communications satellites enabling, *inter alia*, live television coverage of any spot on the face of the earth and it becomes clear that what

significantly goes on anywhere on the world is known within seconds by the rest.

All of this may result in dependence by third-world countries on the West and to a lesser extent on some eastern countries. This then raises a serious issue, namely, the power an advanced nation could exercise over another just because of its access to and use of information and information technology, thereby creating an information "gap". In this regard, Glastonbury and LaMendola (1992: 3) write: "Information technology offers intelligence without integrity. As such it can take on whatever rules or moral standards its designers and controllers choose". Lyon (1991: 14) sounds the same warnings and points out that although a society as predicted by Stonier and Masuda may have some welfare benefits, the same technology could be (and have in the past been) applied for warfare supremacy. (In fact, information technology originated from the need to more accurately guide ballistic and other missiles.) Another warning is sounded by Du Plooy and Roode (1993: 2) by pointing out that information technology is never neutral and its introduction on a large scale therefore never leaves society unchanged.

In response to the potential negative effects that such an imbalance may have on the developing and under-developed countries, the African countries represented at UNESCO proposed the establishment of a "New World Information and Communication Order" (NWICO) in 1976. It was followed in 1977 by a document called "Many voices, one world". These documents focused on the areas of journalism, advertising and television as well as on the effects the large transnational corporations have on less advanced nations.

These proposals lead to some positive action on the part of the less developed countries, but at the same time lead to a departure from UNESCO by some western countries. In 1981 a United States subcommittee found that the NWICO proposals would violate the American First Amendment principles. The USA withdrew from UNESCO in 1984, followed by the United Kingdom and Singapore in 1985, causing UNESCO's efforts to become almost irrelevant.

It did, however, lead to some countries entering into bilateral agreements, such as the communique signed in 1982 between Mexico and France in which they pledged to protect each other's national identity specifically in so far as communication languages in information systems are concerned. Similarly, in 1982 the United Nations passed a resolution forcing satellite owners to obtain mutual consent before broadcasting messages across borders (Lyon, 1991: 112 - 120).

It is clear that there are many sides to the political and global theme. The world thrives on information and in order to compete globally, information technology is fundamental. Governments should, however, be careful how these technologies are introduced into the economy and into society and such introduction in the developing countries in an uncontrolled and unplanned manner, could have the opposite result that what was expected.

### **3.8 Summary and Conclusions**

Human beings and information are interlinked and cannot be separated without life becoming meaningless. It is the most natural thing for human beings to collect and assess data and to convert it into meaningful information by putting it into context and adding perspective. It starts at birth and continues for as long as the brain remains in good health. Withholding information from someone, translates into a poverty for such individual or community. In general, without information, many human needs remain unsatisfied.

A part of the meaning-attributing process is to communicate information. Communicating means sharing; adding value to ideas and thoughts.

Learning takes place through this process; information-as-thing through information-as-process leading to information-as-knowledge. Although information itself is not a fundamental human need, it helps satisfy our needs, that is, through information our needs are being satisfied. It makes life



meaningful and contribute towards self-actualization. To be completely cut off from information is to be reduced to little more than animal status.

Looking at society today, it is clear that we have become information intensive through the mass media and the use of information technologies. As technology evolves and proliferates, more and more information becomes available. In order not to drown in all this information, specialisation and customisation became necessary and the result is television and radio channels, magazines and newspapers and even computer networks catering for particular fields of interests.

Based upon the above, one can justifiably claim that we are an information intensive society; an information society, for short. Bell called this the post-industrial society. This bombardment by information (perhaps more data than information), potentially has a serious impact on individuals and society as a whole. It influences the way we live (take for instance the effect of television on social life) and may in the long run affect our culture. Culture falls in the realm of expressive symbolism and meanings (Bell, 1976: 12). With symbols changing and meaning changing, it is perceivable that culture will also eventually change; already there are clear indications of language becoming a universal (english), dress codes becoming universal (jeans), food habits becoming universal (MacDonalds) and so on. Local and national customs, values and beliefs are threatened to the point of becoming extinct. Contemporary culture may well be changing.

Whether or not advanced societies can be called information societies or just post-industrial societies, the truth is that society has changed once the economy changed from being driven by industry to an economy driven by services. Knowledge became central and took center stage from capital goods. This allowed women and disabled people to enter the workforce and be successful. Developments in information technology and related fields such as telecommunications facilitates the proliferation of the new "good" of post-industrial society, namely, knowledge and information. The one feeds on the

other: more technology can handle even more information and knowledge and more information and knowledge requires even more advanced technology.

A special relationship exists between information and human development. Information to the policy and decision makers in the development arena is essential. Without the necessary information on which to base decisions, financial and other resources may be wasted. By making information available to the masses, basic human needs are being satisfied. The dilemma is that, for both these dimensions, an information infrastructure is a pre-requisite and this is normally not available in developing countries. What is more, an information infrastructure is usually not high on the priority list. This potentially has many negative implications: developing countries become dependent on developed countries for the development and maintenance of such infrastructure and may even be exploited in the process. It also widens the gap between the "have not's" and the "have's".

Does more and more information lead to a "better" life? Postman (1992: 60) poses the same question, but phrases it differently: Are the problems in Africa or Northern Ireland because of a lack of information? Are the thousands of people dying of starvation around the world because of a lack of knowing on how to grow food, or perhaps on how to distribute the food? Information in itself does not and will not solve all the problems in the world. "The fact is, there are very few political, social, and especially personal problems that arise because of insufficient information" (Postman, 1992: 60). This emphasises the point that it is not enough just to have information or knowledge, it is what is done with it.

Lured by the potential powerful position when controlling information, or by the potential to make money out of the selling of information, it is not unexpected to find examples abound of unethical information practices. Technology can be made to serve any purpose; good and bad. James March observed: "Information is not innocent" (Davenport *et al.*, 1992: 53). The illusive nature of information leads to many questions regarding ownership of

information, privacy issues, an individuals right to access to information kept on him and also his right to other information. The proliferation of databases populated with personal information and the potential to establish links between such data bases, is cause for concern. So serious are these issues that it is proposed that an Information Bill of Rights be considered.

There is general agreement that the emphasis shifted from an agrarian economy to an industrial one and then to a post-industrial economy. In this post-industrial economy the driving force comes primarily from the services sector. The services sector's main product is the intellect; information and knowledge. From this view emanates the notion of an information sector, or even, an information economy. Defining this information sector is not an easy task and measuring it even more difficult, especially when different views exist on what is really meant by services and what is meant by information.

What is important to note is that a shift took place in the type of work performed. By far the most people employed during the industrial era did physical (manual) work while few were doing intellectual work. More people today do intellectual work than physical work. This allowed women and disabled people to join the workforce.

Shortly after computers really started making an impact on the day-to-day living of people, predictions were abundant regarding the world being taken over by computers and robots and the human race becoming slaves of such Big Brother machines (the Orwellian scenarios). Having survived the first shock, it is now being realised that technology is just the tool of the information age and that it is only there to serve mankind. The emphasis is on the human and what it could achieve with his modern age tools to assist him. Naisbitt and Aburdene (1991: 6) write: "The most exiting breakthroughs of the 21st century will occur not because of technology but because of an expanding concept of what it means to be human".

Today's competitive environment both for individuals and businesses, has led to constant power struggles. Governments were quick to realise the comparative advantage of controlling information. Information is an integral ingredient in power struggles especially considering the fact that we are living in a world dominated by the intellect as opposed to goods. He who controls information has the power. It therefore comes as no surprise that people are not always willing to share information with others. Yet, information is a collective good; once it has been created, it is by its character, available to all. Ideally, a cooperative strategy should be followed to facilitate the diffusion of knowledge and information into society. It blends well with man's natural instinct to communicate what he knows. The nature of information calls for sharing so that it can grow. This, however, opposes the notion of power to the one who has the information.

Not only did information change the economy's main driving force, it also created its own economy, an economy with different principles from the industrial economy. The economy of information differs from other economies because of the peculiar characteristics of information itself: Information is a collective (as opposed to private) good, does not get "used up" when selling it, could have more than one owner and that there is no "utility" for it. Scarcity gets a new meaning: Having more information does not always mean being better off. Time and the scarcity of it in the information economy becomes an area of focus and people will change their way of living to adapt for the time scarcity. This in itself has effects on the economy.

Information played an important role in business since the early ages. As business became more complex and more competitive, the role was emphasised. Information is used in business to conserve the other resources; capital, human and natural resources. It is used extensively in decision making, but the paradox of more information-produce-better-decisions is again not valid. The solution lies in having the right information and not necessarily more information. This highlights the need for decision makers to define their

information needs accurately. If they do not, information overload will be the result, with the outcry of drowning in data and dying for information.

Government is both the biggest producer and user of data and information in any country. It can use information to oppress or to empower and get participation from its citizens. Censorship becomes extremely difficult in a world of global television and data networks and examples abound where governments were toppled because of citizens being informed from outside the borders of the country. On the other hand it offers governments golden opportunities to allow citizens to participate via opinion polls and in general by allowing transparency.

The importance of information to individuals, society and the economy together with the many ethical issues related to information, lead to the need for a national information policy. Such policy should address citizens' rights as far as privacy, ownership, access and accuracy of personal information. It should spell out the role of private versus public sector interests, the publication of scientific research, the introduction of information and other technologies, taking into consideration the stage of development of the country. It must prioritise these issues.

Lastly, information has changed the world in a global context. Countries, communities and even individuals (celebrities) cannot live in isolation. In order to be a part of this information world, a certain infrastructure is needed. If it is not present, there is no way that such a nation can become a world player. This, again, leads to the burning issue of the third world and its apparent inability to take part in this game. The question becomes: Will it be left to die?

In this chapter information was put into context. Its role and function in business and society has been explored. A framework was created into which information can be fitted. Information now being understood and put in place,



one can turn to its management. In the next chapter information management as a concept will be explored and defined.

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