CHAPTER 3

PRINCIPLES UNDERLYING INFORMATION MANAGEMENT AND TECHNOLOGY POLICY IN SOUTH AFRICA

3.1 Introduction

In the preceding chapter the underlying principles for the formulation and implementation of policy were stated. These have bearing on the thesis in that both the utilisation of information management in the obtainment of data is required in order to formulate executable policy.

This chapter has as its aim to introduce the principles underlying the requirements for the implementation of information technology in public policy making and implementation to the reader. The spectrum of available literature will be discussed and related to the broader concept of the applied information technology. Elements that could bear relevance to the importance of applied information technology in the public service will be identified and in later chapters be described and validated.

The importance of this chapter is found in the fact that it forms the theoretical basis of the arguments regarding the application or lack thereof of information technology in the public sector. It is also the basis from which an argumentative basis is formed regarding on how data is applied in the public sector.

Research indicates that much is written about the capability of the information age and information technology on the public sector. The main problem is that most of this literature focuses on the application

thereof on the line function of the public sector and not much is published on the application of the data capability on the management of the public sector (Van de Donk, _et al_., 1999).

Second to this is that virtually no information relating to the application of the management of the information available is known. Compounding this issue is that most public service tools do not facilitate the conversion of line or operational data to management information (Coombs, _et al_., 1997:203).

3.2 Communication

No electronic governance, and electronic information management, required for the formulation of policy, is possible without electronic communication. This communication has two aspects to it. They are the actual or true communication of fact (for example information) and the physical communication (tele-communications) by means of networks and construction (for example relay stations and satellite connections). The focus of this section will be on the actual or true communication and will not endeavour to elucidate on the technical aspects of tele-communications (Coombs, _et al_., 1998:203-217 and Garber, 1982:555-563).

Communication is not an aspect that should be handled in isolation. Communication forms an integral part of the whole electronic governance issue. This holds especially true when required for policy formulation and implementation (Dye, 1987:7).

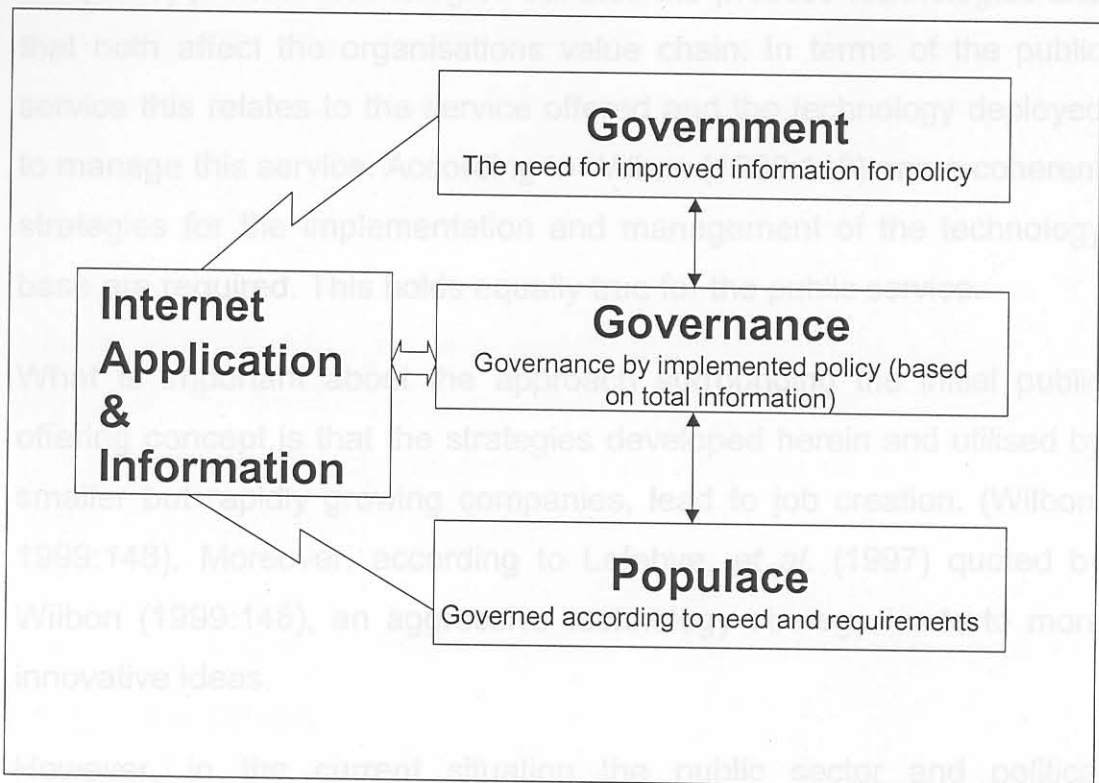## 3.3 Information application for policy formulation and implementation

Coombs, _et al._ (1997:203) refers to the new concept of elites and elitism. Dye (1987:29) also refers to elite theory in which he states that the people are usually ill informed about public policy. This _de facto_ implies poor communication and information application. Coombs, _et al._ (1997:204) do not, however, equate these concepts with the classical perceptions of have and have-nots but move to the innovation of the twentieth century called the Internet. In this context they are more concerned with the total telecommunication revolution linked to this innovation.

What should be stated categorically is that telecommunication is purely a vehicle by which data is transmitted. In this scenario leadership, knowledge and information are the elements required maintaining a government department. Communications (political or otherwise) on the other hand reflects the application of the various elements and refer to the process of influencing individuals. In this regard the focus of the work of Coombs, _et al._ (1997:204) will be on the process and not the technology _per se._

Coombs, _et al._ (1997:204) quoting Grossman (1995:7), present a new view on the electronic democracy that argues that most studies of government, politics and the media start by examining the qualities of leadership that define political life. This view could graphically be presented as is depicted in Figure 3.1.

Figure 3.1: The Political Environment: Applied Internet Use

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                        ┌─────────────────────────────────────┐
                        │           Government                │
                        │ The need for improved information   │
                        │           for policy                │
                        └─────────────────────────────────────┘

┌──────────────────┐    ┌─────────────────────────────────────┐
│ Internet         │    │           Governance                │
│ Application      │◄──►│ Governance by implemented policy     │
│ &                │    │      (based on total information)    │
│ Information      │    └─────────────────────────────────────┘
└──────────────────┘
                        ┌─────────────────────────────────────┐
                        │            Populace                 │
                        │ Governed according to need and      │
                        │          requirements               │
                        └─────────────────────────────────────┘
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Source: Coombs, *et al*., 1997:204-205

In essence Figure 3.1 depicts an approach, which is both top-down and bottom-up in terms of leadership approach (Coombs, *et al*., 1998:204). It also depicts the constant interaction between the political environment and the need for management information. According to Coombs, *et al*. (1998:205), the growth in the application of the Internet for political communication will lead to a new knowledge elite. Derived from Figure 3.1, policy formulation is executed at governmental level and the implementation thereof is a function of governance. Hence, having applicable information available will lead to the formulation of applicable and usable policy and the implementation thereof (Dye, 1987:323-349).

When considering technology as part of the communication process, cognisance must be taken of the integrative nature of the total information management process. In this regard Wilbon (1999:147) is

of the opinion that the technology management must not only address the (firms) product technologies but also the process technologies and that both affect the organisations value chain. In terms of the public service this relates to the service offered and the technology deployed to manage this service. According to Wilbon (1999:148), more coherent strategies for the implementation and management of the technology base are required. This holds equally true for the public service.

What is important about the approach surrounding the initial public offering concept is that the strategies developed herein and utilised by smaller but rapidly growing companies, lead to job creation. (Wilbon, 1999:148). Moreover, according to Lefebve, *et al*. (1997) quoted by Wilbon (1999:148), an aggressive technology strategy leads to more innovative ideas.

However, in the current situation the public sector and political communication strategy is not so far developed. Coombs, *et al*. (1998:205), refer to the contemporary yet dated method of political communication as that of television and that this method is not as effective as one would hope. Their reasoning is based on the fact that time slots inhibit the actual message to get across to the receiver. There is, however, a method called sound-bites (Coombs, *et al*., 1998:205), which allow the participants to communicate lengthier segments. The sound-bite facility does not, however, overcome the inherent shortcomings of the television broadcasts time and cost limitations. According to Coombs, *et al*. (1998:205), this leads to a situation wherein the traditional voter is largely uninformed about the political process, the government functioning, and the governance outcomes and related issues. Coombs, *et al*. (1998:206) are of the opinion that no cognisance is taken as to the voter or user application or dissemination of the presented information thus ignoring the voter's or user's potential requirements for improved governance (Dye, 1987:15).

Coombs, _et al_. (1998:207-208) are of the opinion that in the United States, the mass media assumes the central role over political communication. The media effectively controls the message, the information and even presents guidelines for interpretations of the message. They herein refer to the economic and media elites of American politics. This holds true for the South African context as well. In this scenario the economic and political elites subsidise the information gathering process providing information at a lower cost. Obviously the dominating party controls the information available and, in turn, the suggested interpretation thus negating individuality of this action (Coombs, _et al._, 1998:208).

3.4 Knowledge and policy formulation and implementation

Conceicao, _et al_. (1998:181) state that knowledge is becoming the key strategic resource for economic development worldwide. Quoting Abramowitz and Dawid, Conceicao, _et al._, (1998:181) state that the current growth in the knowledge base is altering the form and structure of economic growth.

Conceicao, _et al._, (1998:183), quoting Wilson, state that increase in the need for knowledge has resulted in an increase in job creation. An increase in the job creation tendency was especially true to the first world countries and to a lesser degree the third world countries. A further result was that more of the developed countries workforce was employed in the service sector than the lesser developed countries indicating a relationship between level of development and service level (Conceicao, _et al._, 1998:183). Again Conceicao, _et al._, (1998:184) make the comment that there is a relationship between knowledge and employment creation and development as job creation is dependent on the knowledge and skills level of the populace.

The emergence of a new elite group referred to as the knowledge elite and as an Internet user may supplement information obtained through the mass media with information obtained from the Internet thus completing the full picture. Supplementing information allows the users (knowledge elitists) to re-present the information and formulate their own opinion (Coombs, _et al_., 1998:209). The re-presentation of information allows people to become empowered through the use of the Internet and allows the citizenry to become part of the knowledge elite as they can access information directly and conclude their own inferences (or spin-off on information) from this data/information. This data interpretation is enhanced when the public is allowed to post comments as participating members of a newsgroup or on a Web site. This in turn enables the government to promulgate applicable and executable policy, based on informed and real requirements and that are required to enhance service delivery. (Coombs, _et al_., 1998:211-212).

3.5 Mobilising for improved policy making and implementation

According to Coombs, _et al_. (1998:12-13), communicating with and mobilising the grassroots are extremely important. In order to facilitate mobilising, issues must be clearly stated as to reasoning behind such a matter and the action(s) required to resolve the issue. In this regard the Internet, as a solution provider, outclasses the mass media which suffer the inherent problem of limited space and a high cost aspects.

Browning (1996:61-62) does, however, offer a warning that online mobilising (his reference is organising) is not totally effective if not supported by one-on-one follow-ups. Browning (1996:56) is also of the opinion that interpretation of a suggested issue might not be correctly understood even if a detail online brief is supplied. Lastly Browning

(1996:56) warns against soliciting support for an issue through the Internet (cyberspace) as the Internet users represent a vast variety of political philosophies and various other skills.

Communication and information has to be explored in terms of the management paradigm in order to understand the need for information. In this regard, data, which is plentiful and resides in huge databases, needs to be re-worked to executive management information in order to facilitate the requirements of the manager to execute his/her task(s).

3.6 Public service and information management

With regard the presupposition of this thesis it needs to be understood that management comprises two aspects that need to be in harmony. These two aspects are the transactional management capability relating to line, staff and functional orientation and required for day-to-day decision-making with regard the day-to-day tasks. The other is executive management information required for the future strategic planning and positioning of the department/organisation.

The concept of management underpins the total ambit of all activities of the public sector. Herein is found that a move away from the classic top-down management of the public sector to the more acceptable (modern) methods of the private sector. The applications of these methods are obviously dependent on information and strategy in order to apply the data found in databases. This thesis will, however, not endeavour to formulate new management rules *per se* but rather utilise those that are pertinent to the topic of information management.

The management paradigm throughout the twentieth century developed from a closed functional bureaucratic approach with formal structures to a process and open systems driven approach (Roux, *et al.*, 1997:18). In the present contemporary era various management improvement and

departmental restructuring mechanism are utilised to optimise departmental management. The phrase coined to this change management was business process re-engineering (BPR). Much is written about business process re-engineering (the process through which an organisation re-organises from a functional (silo) approach to a process driven organisation) which many of public service departments nationally and internationally underwent during the latter half of the twentieth century. The business process re-engineering approach is fundamentally based on the approach of input-process-output. Various toolkits are, however, available to execute the analysis and business process re-engineering exercise. At this time many government departments are still continuing this business process re-engineering exercise applying tools such as the IDEF™ (IDEntification of Function). This tool-set also incorporated a modelling ability in order to facilitate "what if?" scenarios (Interview with the Director, Xcel, 2000).

Doolin (1999:96), quoting Bloomfield and Danieli, (1995), refers to a socio-technical order. This socio-technical order refers to an implicit dualism between the socio-order and the technology order is made. The socio-order here may be compared to the bureaucracy as used by Turner, *et al*. (1999:296). The comparison is done in order to facilitate the relationship between an organisation's requirement for technology-based solutions and the management style in use in the public sector.

Project management as a management tool also originated around the latter half of the twentieth century. Implied in this process is the management of individual tasks (or projects as tasks could become a project in its own right) across functional boundaries. The management of tasks or projects, in turn, implies that within organisations strategic goals had to be identified and managed as an individual project from inception to completion. Turner, *et al*. (1999:296) are of the opinion that the project and process phase development was initiated at the same time to respond to the almost constantly changing nature of work and

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management. Sparruis (2000), as a leader in the field of software engineering and project and process analysis in the South African scenario, follows the same approach.

Doolin (1999:96), quoting Law (1994), comments on the function of ordering as an effect of a process. According to Doolin (1996:96), ordering implicitly is applied as a management method of communication within the process approach. Ordering in turn has direct links to the bureaucratic style of management.

What becomes of importance to this study is the management model designed by Weber, translated and published in English and utilised in the latter half of the 1950's, referred to as the ideal bureaucratic model (Turner, *et al.*, 1999:299). This model based on a hierarchical, mechanistic and very functional approach with authoritative environment was utilised by virtually all public and private enterprises until the seventies. (It need be noted that technology development such as computer databases in the fifties was still in its infancy.) The Weber model (Turner, *et al.*, 1999:299) required that clear guidelines for management and workers alike, were developed. The development of guidelines at all levels did not leave much room for initiative, creativity nor the application of information as a management tool (Turner, *et al.*, 1999:299).

In an attempt to circumvent the strict guidelines imposed by the bureaucratic model, socio-technical networks were established to form a working whole. (Doolin 1999:97, quoting Law (1988)). According to Doolin (1999:97), non-human elements for example the information technology, form an intrinsic part in the coherence of this network.

Turner, *et al.* (1999:300) state that as the technology in the computer arena developed due to various reasons e.g. the space race, the Cold War, military requirements and the fragmentation of mass markets, the bureaucratic model of Weber (Turner, *et al.*, 1999:300) was challenged.

The challenge arose in that information was now stored and became available for the management task. Also, that all the afore-mentioned activities needed development detail only available in the developing databases of the computers (Turner, et al., 1999:300). The development of such items that was required for the space race resulted in a requirement for a management method not curtailed by the functional bureaucratic method (Turner, et al., 1999:300).

The project approach resulted from the order of magnitude of tasks the space race and military development created. These tasks had to be defined and sub-divided with a definite beginning and end date and defined outcomes or milestones (Sparruis, 2000). The project approach also resulted in a management methodology whereby the execution of the project resulted in cross-functional or transversal integration. The transversal integration of management was contrary to all bureaucratic functionality principles (Turner, et al., 1999:300). Problems experienced with the transversal integration of management are the breakdown in governance of the bureaucratic management approach and the working in more than one function (Turner, et al., 1999:299-300).

The transversal integration approach led to a re-think of the bureaucratic approach in terms of modelling it in accordance with process rather than function (Turner, et al., 1999:301). The adaptation of the bureaucratic approach introduced the Total Quality Management approach of the eighties (Turner, et al., 1999:301), in as much the requirement and need for executive management information to manage an organisation, grew. Doolin (1999:100) is of the opinion that drawing data (from a hospital system – the New Zealand public hospitals) and manipulating such data for financial and other purpose results in an executive information management tool for improved administrative and executive management. The executive information management process, including performance management and trend analysis, is then based on the wealth of data captured on a database.

Turner, _et al_. (1999:302) state that in the classical management and administration model the functional hierarchy serves to govern the organisation. However, for the function of project management, operational control is required. Hence the fact that governance is inward looking and operational control outward looking as operational controls effects more than one function (for example logistics, personnel, finances and the core business of the organisation) (Turner, _et al.,_ 1999:302).

Doolin (1999:97) applies the New Zealand public hospital example to this scenario, quoting the **Health and Disability Act, 1993** (New Zealand) which transformed the New Zealand public hospitals into Crown Health Enterprises (operational control - outward looking). In transformation scenario, the New Zealand government endeavours to transform the health services into market related competitive entities (governance – inward looking at the administration and management of government at all spheres). In the transformation endeavour a focus is placed on improved operational control and governance to wit management, accounting and economics (Doolin, 1999:97).

Turner, _et al_. (1999:303), identify four elements for operational control to wit:

a.   Process management.

b.   Customer management.

c.   Input management.

d.   Output management.

In terms of relevance to policy formulation and implementation in the public sector, it may be stated that process management relates to the transformation drive in the public sector for optimised service delivery. The identification of the processes to be utilised within the department

will be aimed at the core function of the department. When optimised, this in turn, will improve the service delivery to the customer. The customer, then, can be optimally managed with the resultant outcomes to the benefit of both customer and department. Input and output management is clearly an integral part of the optimised process as the process can only be initiated with input and be concluded with an output. Internally to the department, governance is improved. The interaction of these elements is depicted in figure 3.2:

Figure 3.2: The Four Elements of Operational Control
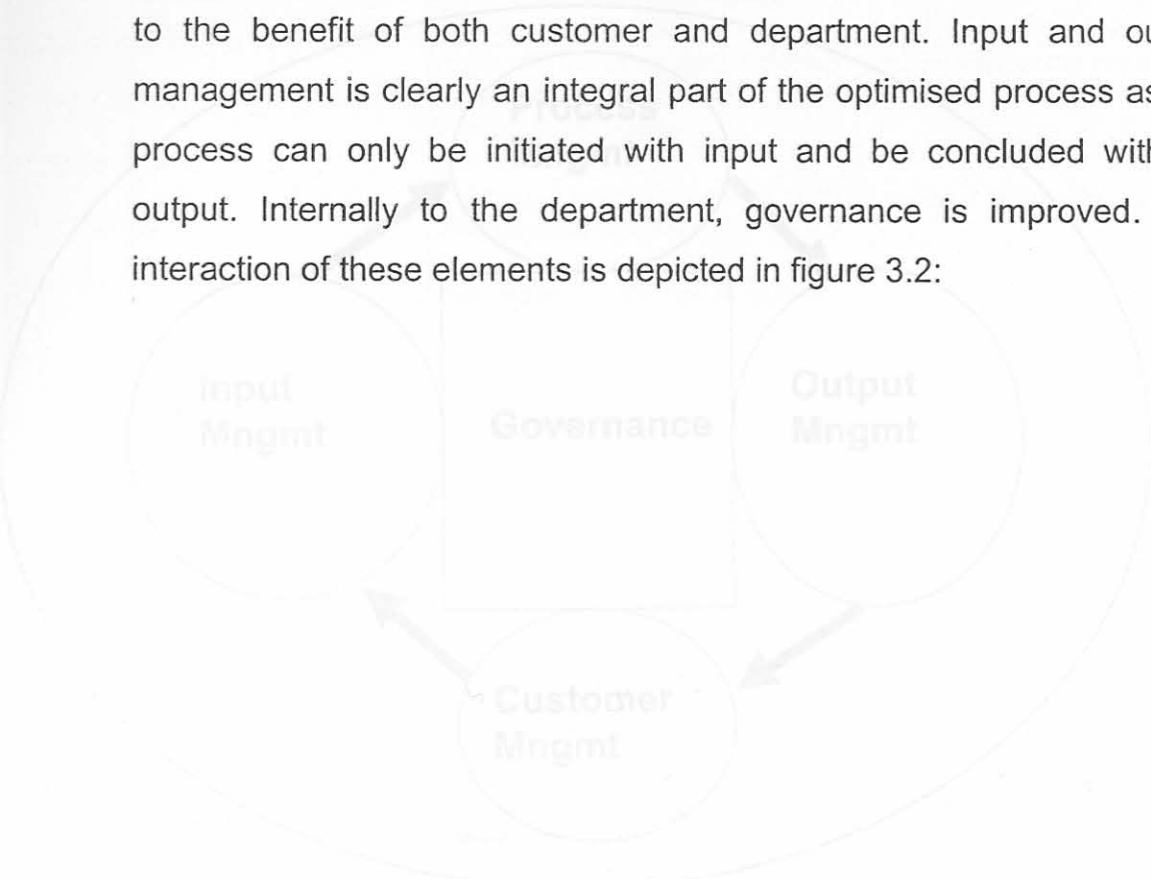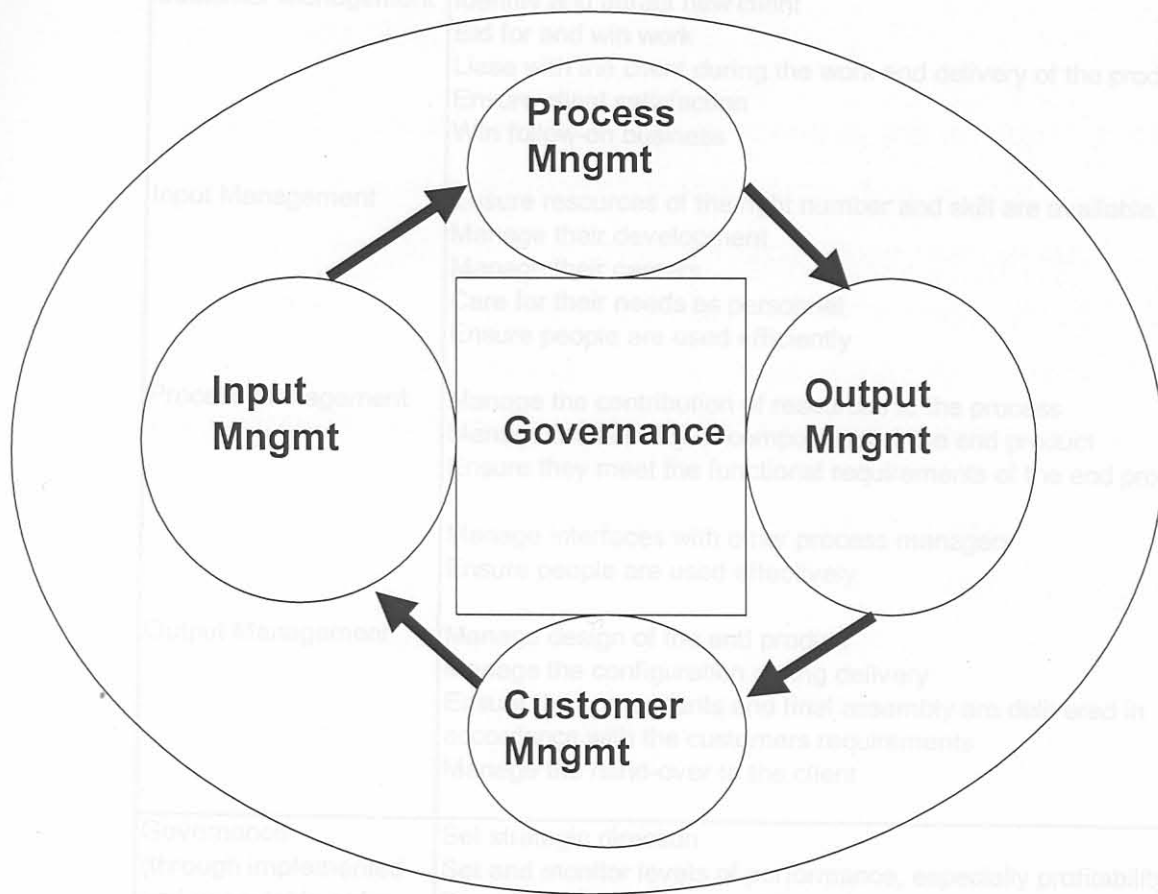
Source: Turner, _et al._, 1999:303

According to Turner, _et al._ (1999:303), each element of Figure 3.2 has a specific function and role. This is depicted in Table 3.1:

Table 3.1: Four Functions of Operational Control and Governance

Function	Role
Customer Management	Identify and attract new client Bid for and win work Liase with the client during the work and delivery of the product Ensure client satisfaction Win follow-on business
Input Management	Ensure resources of the right number and skill are available Manage their development Manage their careers Care for their needs as personnel Ensure people are used efficiently
Process Management	Manage the contribution of resources to the process Manage the delivery of components of the end product Ensure they meet the functional requirements of the end product Manage interfaces with other process managers Ensure people are used effectively
Output Management	Manage design of the end product Manage the configuration during delivery Ensure the components and final assembly are delivered in accordance with the customers requirements Manage the hand-over to the client
Governance (through implemented and executable policy resulting in processes)	Set strategic direction Set and monitor levels of performance, especially profitability Provide finance and control financial returns Provide technical expertise through centers of excellence Provide an audit function Control risk exposure

Source: Turner, _et al_., 1999:303

When applying these roles to the model depicted in Table 3.1, it becomes obvious that a department accentuates the added value and value chain principle (Turner, _et al_., 1999:303). However, in the classical model of management based on Weber, these activities are as portrayed in Table 3.1 to wit executed in series (Roux, _et al_., 1997:22). In the process approach they will be execute in parallel (Turner, _et al_., 1999:303 and Sparruis 2000). When considering the method in which governance is applied (Table 3.1), it is found that very rigid military type governance is applied to the Defence industry. On the other hand more empowering type governance is found when this

methodology is applied in the engineering environment (Turner, _et al._, 1999:307; Director Enterprise Information Systems Architecture, Department of Defence, 2000 and Director, Xcel Information Technologies, 2000).

An interesting development in this scenario is the introduction of new information management components. According to Doolin (1999:98) the introduction of a new information technology management system in the New Zealand health services lead to a better visibility of the management and accountability functions within the service. This in turn improved the management functionality of the health service.

Doolin (1999:98), quoting Bloomfield, refers to the introduction of the information technology management (based on a project approach) as a socio technology introduction. Doolin (1999:98) also introduces a new element to wit departmental change (departmental arrangements development). Referring to what was commonly known as the line function Doolin (1999:99), quoting Malcolm, introduces a new concept known as service management. Herein is captured the application of the information of the databases of an organisation. Doolin (1999:107) is of the opinion that existing management reports obtained from databases is classical user-unfriendly and need to be addressed.

3.7 Information technology as a solution provider

The need for specific criteria e.g. functional running of the specific departmental structure or the need for data interpretation for management and administrative application must be explored and decided upon. Furthermore consideration has to be given to the usage of free data such as is available from the Internet or service providers (Schalken and Tops, 1999:144-145).

Electronic government and governance for application in the policy formulation and implementation scenario, is to be assessed and validated. This aspect must address the shift in paradigm from a manual methodology to an information technological arena and the application of the data already contained in databases for management and administration purposes. It must and will further address the aspect of utilising benchmarking in terms of the Information technology instead of the accepted base for decision-making. In this the realm of best practise suites will be brought to the fore. Coupled to this aspect will be the need for the continuous validating of best practise suites and methodologies.

In as much as the effectiveness and efficiency of the application of information technology is explored, the link with the communication arena is essential. Coupled to this will be the current public service approach of performance management and the proposed methodology to follow. Again the concept will be benchmarked against existing experiences.

The basis for this will obviously call on standards being set and utilised as well as the adaptation of innovations in the field of information technology. The whole drive towards e-commerce will also be described as it impacts on especially third sphere of government. Outsourcing the information technology component and the impact of the high technology industry is also a consideration from a cost perspective, given the rapid enhancements in technology.

3.8 Applied information technology

Information technology may be as modern as is obtainable but will not be able to be applied if a defined and integrated infrastructure does not exist for the utilisation thereof. Thus the point of departure for the information age is a capability to, not only transmit data, but also to

receive and make this data accessible to all users for management and administrative purposes. Data accessibility should apply to all three spheres of government. Taylor, _et al_. (1999:61) refers to teledemocracy. This, according to Taylor, _et al_. (1999:61), is the combined application of telecommunication and computers. In the application of electronic government and governance and the availability of information vis-à-vis the citizenry, these two aspects are interdependent. Access to the cyber highway is through the use of the telecommunications network be it telephones or satellite. In the current scenario the Internet or web based telecommunication is Tele-linked. More use of satellites is being applied. This method is, however, still controlled by the availability of telephone services (Taylor, _et al_., 1999:63). Given the communication highway as the basis, the following step would be to enable (empower) the citizenry in order to grant them access to this information. Enabling the citizenry again leads to the capability of the office bearers to be empowered so as to improve management and administration through improved two-way communications. Information captured and made available should cover the total spectrum of the governance at all spheres (Taylor, _et al_., 1999:63-64).

The basis for the application of information technology would probably be said to be well-populated geographic information service. This type of service, known as a Geographic Information System (GIS), is primarily built up of information pertaining to the total (political) referencing area. Again it must be said that a tool such as the Geographic Information System is a management enhancement tool in its own right. In the current application one could compare it to the information vehicle tracking services utilise for scheduling and tracking vehicle fleets. However, in the political application, typical data that should be contained in the system should reflect sizes of households, voters, general political orientation of such voters/households. More

general information such as conditions of living (squatter camps or established suburbs), local governmental conditions and orientation and the average financial situation within such a community, is also needed (Snellen, 1999:58: Interview with Project Manager Electoral Logistics System, Independent Electoral Commission, 2000).

By applying this tool-set the democratic role of bureaucracies will be strengthened as the Geographic Information System visualises the areas not only in terms of problems but also in terms of disposition. Relational databases will then be able to present categories and voter/populace distribution more readily. This points to improved management capabilities of departments. It will become easier to track movement of the voter/populace and determine the main reasoning for such an action (Snellen, 1999:58).

The advantage of such a system is found in the fact that appropriate planning may now be possible as specific geo-referenced areas might have unique requirements. By identifying the unique requirements, it may be found that politicians will be able to determine and focus on specific needs within a community. Focussing on specific needs will enhance the politicking capability of the party, if applied correctly. It is also obvious that no constraints should be placed on the availability of this type of information (Snellen, 1999:59).

3.9 Improving policy making and implementation through information management and technology

In the application of the information, the technology applied infers to aspects such as e-mail, bulletin boards, and access to committee meeting records and agendas. For this purposes web pages are generated containing the electronic links to the different aspects. More commonly these links are referred to as Uniform Resource Locators (URL's). In applications where general use of e-mail and committee

agendas and minutes where made, the political incumbents had more time available to apply to there actual task as representatives of the citizenry (Taylor, *et al*., 1999:64). As much as the global village concept (with reference to communities being able to communicate locally, nationally and internationally), is gaining ground, so to is the concept of Electronic Village Halls (EVH) where local councils communicate electronically with there voters. The purpose is to allow maximum access to all citizenry to al information with regard their governance and ultimately to electronic data interchange (EDI) (Taylor, *et al*., 1999:64). The actual applications of this function are generally low, with the United States of America being the most advanced. With regards to accessibility of information, the United Kingdom and Western Europe are, on average, below 20 % but improving on a year to year basis (Taylor, *et al*., 1999:66). Accessibility to information leads to both the legislature and the voting populace in making informed decisions, which in turn may be related to improved policy formulation.

An aspect as yet not explored within many governments is that of electronic documentation. This form of applied information technology is, however, widely used in the private sector to great success and productivity improvement. This process does not eliminate the use of paper but greatly reduces it. The process primarily implies that all current transactions or files are electronically scanned into a central database and through the use of data manipulation made available in management reports or even as the original document if so desired. This in turn enhances the capability of the departments concerned in the formulation of executable and applicable policy. Vintar (1999:100) reflects on this process as being applied in Slovenia. In the South African context the Government Printers are now considering this type of application (Interview with Programme· Director, Klynveld, ·Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, Independent Electoral Commission, 2000).

In all that is said one has to consider the information being made available or imparted through the use of electronic media. Bellamy, *et al*. (1999:79) refer to this as electronic exchange of information with the public (EIP). The methodology of applied information technology enables (empowers) the citizenry through the use of information that is updated and available continuously and at any time (real-time information). Real-time information also enables them to communicate with their representatives in a real-time environment. In turn, any proposed policy may be communicated to the populace for comment. This implies that a direct democracy is more real and available to those who have access to the information (Bellamy, *et al.,* 1999:80).

Information technology applied correctly will improve the flow of information and make more information accessible to the citizenry. This implies better and improved communication between the office-bearers and their support base and improved management capabilities, which might include policy proposals, for the office bearers (Vintar, 1999:97). Benefits that are obtainable by applying information technology at all spheres of government are as follows (Vintar, 1999:98):

a.   Improved productivity through better time utilisation.

b.   Improved access to information pertaining to the representative's field.

c.   Eventual reduction of cost but definitely an improved utilisation of funds.

d.   Improved management and administration due to improved reliability of data.

e.   More transparent governance.

f.   Improved contact with the citizenry.

g.   Improved workflow that will lead to departmental optimisation.

h.   Improved system design of the relevant tier/organisation.

i.   Standardisation due to the improved workflow analysis.

Although Vintar (1999:98) cites two benefits that are more closely related to the application of information technology, three more should be added in terms of the South African frame of reference. Vintar (1999:98) is of the opinion that the two benefits applying most to the field of information technology are:

a.   Improved access to information pertaining to the representative's field.

b.   Improved contact with the citizenry.

However, considering the South African situation the following three should also be added to the list that is a direct outflow from applying information technology to optimise democracy:

a.   Improved productivity through better time utilisation.

b.   Eventual reduction of cost but definitely an improved utilisation of funds.

c.   Improved workflow that will lead to improved management and departmental optimisation.

In essence it could be stated that all democracies should consider these three additional benefits in the application of information management and technology. In making the information more accessible to the citizenry, the common application of data being of a one way nature and being utilised by the representatives at their various levels, for amongst other policy formulation, now becomes a two way communicative and integrative process. This leads to the second benefit objective, to wit improved contact with the citizenry,

being attained primarily due to the integrative process as a result of perceived virtual one-to-one communication (Vintar, 1999:98).

Considering increased productivity, reduction in cost and improved workflow, the application of information technology will lead to a more productive system as both the representatives of the citizenry and the public servants will be able to focus on the real issues of the day. Combining this with more reliable data and improved workflow (the third added benefit), public servants and representatives will now be able to commit themselves to better governance of their particular sphere through improved executive management capabilities (Vintar, 1999:103). Improved executive management capability is stated with the presupposition that all spheres and all local government authorities have equal access and knowledge of their information management and technology capability. The second added benefit is an extremely contentious one due to the perceived notion that informationalising an authority is extremely costly. In essence the statement holds true in terms of initial capital layout. However, as technology becomes cheaper, the maintenance cost will be low. The benefit, however, needs to be found in the longer term as the productivity improves and due to the visibility of issues and information, funds can be directed in the right direction. Thus the initial and eventual cost of the system could be offset against benefits and savings obtained from other projects.

Vintar (1999:99) comments on the historic application of information technology as that of automation. In this the author's statement holds true for most national and international spheres of governance. It also holds true in terms of systems being implemented, thus implying a relative high level of computer literacy, but does not mean that the obtained information is used deductively or even as a political communicative tool. In defence of this situation one must say that the systems implemented were basically support systems for the finance, logistics and eventually for the human resource departments.

Approaching the information age the need for executive management information becomes essential for not only the management task alone but also for the maintenance of existing and formulation of new policy requirements. The expansion of borders and the increases in service provisions at all spheres necessitated and increased awareness of executive management information requirements. The citizenry's representatives realise that in order to maintain closeness and be in touch with their support base, real-time information pertaining to needs is required. The combination of needs and real-time information, as a requirement at all levels of government, forced a new outlook of the information technology available and the application within the governance and politicking scenario especially in the arena of policy formulation and implementation. This supports the two-way communicative benefit explained in the preceding paragraphs.

3.10   Information technology, agenda setting and communication

The media utilised in agenda setting and communication, may even be the Internet or any other super cyber-way, and must never be underestimated in the political arena. This concept is not new and it has been recorded that this combined with the use of information technology is a powerful tool (Browning, 1997:47). In the United States of America the Republican Party maintained a database on the presidential candidate of the Democrats (Mondale) by which inconsistencies in terms of policy statements where mapped and deviations exploited. Through this means the Republicans maintained the election initiative (Van de Donk, _et al._, 1999:13).

In essence the integrative use of agendà setting, communication and information technology allows the politician and the citizenry to be kept up to date with actual needs. This achieved through interactive opinion

polls and preferences are determined by the results of these polls. So to may opinions be influenced by the application of for example group discussion on the Internet, videoconferencing and bulletin boards. The agenda setters may also manipulate the citizenry to follow a specific though by putting it across in terms of their preferred environment if this environment is known (Van de Donk, *et al.*, 1999:18-19). Abramson, quoted by Van de Donk, *et al.* (1999:19), reflects that the United States of America applies video and mail facilitation to great success in order to enable the citizenry to be informed about the representative's parliamentary activities.

The question may well be asked as to what the key issues are in electronic government and governance. The answer is to be found in the collective bargaining ability of electronic government and governance in that interactive communication is possible. As interactive implies a real time communicative process this in turn implies an educational process whereby the citizenry is educated with regard to not only the representatives agenda but also to the functioning of affairs of general interest of that specific sphere of government. This could be established through e-mail, group discussion facilitated by bulletin boards, Free-Nets or virtual communities (as used in the United States of America and Western Europe) and the like (Van de Donk, *et al.*, 1999:19).

In the South African situation, political communication is now only starting. Policy formulation and implementation based on electronic communication is in an initiation stage with the use of intranet applications in the South African Defence Force, Department of Justice and the Independent Electoral Commission. These departments are currently applying the electronic media in an experimental way to improve policy making and implementation (Interviews with Deputy Director General Corporate Services, Department of Justice, 2001, Director Enterprise Information Systems Architecture, Department of

Defence [South African Air Force], 2000 and the Manager Voting Station Infrastructure and Electoral Logistics [Chief Director], Independent Electoral Commission, 1999).

3.11   Integration

Agenda setters, through pressure groups, may apply information technology by means of polling, discussion groups and availability of information (media agenda setting) to influence citizenry with regard specific issues. In such a case the United States of America abortion lobby enabled the pro-life lobbyists to contribute to their activities with great success. The success of the lobbying also made the democratic process available to a broader base of the citizenry (Van de Donk, _et al._, 1999:21). A further advantage of applied information technology and information management is the perception by the citizenry that they are approached individually. Applying this methodology, the representatives or even the public departments will be able to mobilise a greater support base and increase their sphere of influence. This _ipso facto_ implies that the democratic process is in effect enhanced due to the dynamics inherent in the cyber agenda setting method. In effect the republican view of democracy may thrive of this as deliberation is the order of the day yet policy making and agenda setting remains in the hands of the citizenry. Dynamic electronic agenda setting will also be beneficial to the proponents of the liberal democratic point of view as the stalemate situation of agenda setting will be all but eliminated. The application of databases is of major cost cutting importance. Applying this concept with direct mailing enables the parties to reach larger groups faster and more easily (Van de Donk, _et al._, 1999:25). Combining this with information from the geographic information service enables the agenda setters to form specific messages to specific target groups thus soliciting support. One definite advantage of this method is

that if applied correctly, the hostile press/media could be avoided (Van de Donk, _et al._, 1999:25).

Existing methods of communicating political agendas will not be negated but rather supported. When political parties apply television, radio or other means, the individual already in communication on the issue will have better insight and understanding of the topic (Van de Donk, _et al._, 1999:25). Extrapolating this theme means that actually less needs be said to achieve more impact thus minimising the advertising cost.

As a word of caution, information technology could lead to a distancing of the political representative or the public office bearer from the citizenry if applied incorrectly. If the media is allowed to highjack the process this medium of communication might well become the political cornerstone in terms of influencing the citizenry and relegating them (the citizenry) to a status of uselessness (Van de Donk, _et al._, 1999:23).

3.12   Electronic information management

The application of the electronic information, geographic information service input and the relevant databases imply that agenda setters and policy makers can now utilise statistics in the strategy formulation. This in essence should lead to a more productive public sector in that representatives can now determine issues or agendas scientifically and more accurately compile the solution thus managing their departments professionally. An advantage of departments being better managed, combined with the accessibility of information, will also enhance the capability of investigative committees. This benefit alone should save costs to a great extent as much time is spent by representatives on these committees (Van de Donk, _et al._, 1999:26)

The database concept and electronic documentation should also alleviate the politician's workload in that more detailed reports is available at any time, systematically and more readily. Progress with regard agendas (issues) would be more transparent (Van de Donk, *et al.*, 1999:27).

The integration of the various public and private databases might assist government to optimise on its revenue situation. As an example serves the South African and United States of America situations where an integration of financial institutions, parastatals and public databases (now) enable the Receiver of Revenue to reach a broader tax-base and lessen tax evasion. The privacy debate regarding this issue is yet to be addressed. Other advantages are located in the day-to-day running of the public offices in that fraudulent transactions are more easily detected (Bekkers, *et al.*, 1999:216).

3.13   Information management and technology in the International environment

Information technology per definition this media may be the application of the Internet or any other super cyber-way. The power of the electronic media must never be underestimated in the political arena. It has been recorded that the combined use of information technology and media application is a powerful tool (Browning, 1997:47). As stated previously, the Republican Party of United States of America maintained a database on the presidential candidate of the Democrats by which inconsistencies in terms of policy statements where mapped and deviations exploited. Through this means, the Republicans maintained the election initiative (*Supra* Chapter 3, par 3.10).

Information technology allows the politician and the citizenry to be kept up to date with actual needs as are applied in the United States of America. This is achieved through interactive opinion polls and

preferences are determined by the results of these polls. The citizenry may have opinions influenced by the application of, for example, group discussion on the Internet, videoconferencing and bulletin boards. Thus politicians manipulate the citizenry to follow a specific thought by putting it across in terms of their preferred environment if this environment is known (Van de Donk, *et al.*, 1999:18-19). Abramson, quoted by Van de Donk, *et al.,* (1999:19), reflects that the United States of America applies video and mail facilitation to great success in order to enable the citizenry about the representative's parliamentary activities.

Similarly, Canada has adopted a public route by implementing policy on and introducing electronic e-mail in their postal service. In addition to regular postal services, Canadians can now electronically send and receive letters and utility bills and taxes over the net (Time, Dec 13, 1999).

Not to be left out and definitely to be considered, as an African renaissance example, is the Jordanian example of applied information technology. Based on relatively scarce data, the Jordanian public service implemented policies for the adoption and use of information technology in the institution. In addition to this the use of Internet activity in the ever-expanding application of electronic technology, is benefiting the Jordanian democracy. The application of e-mail and other Internet activities not only broaden the average Jordanian citizens' scope but also improved their democratic participation (Ahmad, *et al.*, 1998:117-134).

In summary it could be stated that the concept of creating a conversational democracy is in the happening. As stated previously, throughout the impeachment hearing of Clinton the concept of an electronic town hall, as advocated by Ross Perot, became a reality. In as much as the Republicans wanted the hearings to be stopped, so

much the Democrats exploited the situation (*Supra* Chapter 1, par. 1.10.4). Interesting enough, all ambits of the communications media, from the printed media to the electronic media, where involved (Tapscott, 1999:35).

3.14   Requirements for electronic governance

Although Dinar (1996:1) points out that socio-economical problems continue to hamper access to information and communication technologies in Africa, the author is of the opinion that information technology in the public service as well as the greater private sector is on the increase.

Using Africa as an example, Dinar (1996:1) states that low levels of knowledge and inadequate skills have contributed to the failures of applied information technology at all levels. Herein the author states that knowledge, information and the use of communication are interrelated.

Dinar (1996:2) is also of the opinion that a cluster of technologies is responsible for the enhancement of information management. The cluster of technologies includes (tele-) communication and computers but does not preclude other means such as the Internet and Intranets. According to Dinar (1996:2) the four main technologies that are required for information access in developing countries are:

a.   Desktop Publishing (Applying Personal Computers).

b.   CD-ROM (Compact Disk Read Only Memory).

c.   On-line access (Local and Wide Area Networks – LAN's & WAN's - such as University or Government servers).

d.   Internet (through TCP/IP connections).

Desktop publishing has fast replaced the conventional typewriters and is still a growing technology in Africa. There are certain inhibiting factors such as skill levels and economic standards. CD-ROM's are a major asset in terms of maintaining large volumes of information in a relatively small and less costly environment vis-à-vis a conventional library. Similarly, on-line access enhances student and research capability in that virtual research through local and wide area networks is possible, eliminating the need to frequently visit research institutions. The availability of the Internet obviously renders more benefits in that the on-line capability is expanded internationally to any search engine to access virtually any required information source (Dinar, 1996:6-7).

3.15   Information management and technology in the South African environment

The South African Government, through its Batho Pele principle, committed itself to improve service delivery in the public service. It also committed itself to give citizens full and accurate information about the public service (**Draft White Paper on Transforming the public service**, 1997:6).

In the public administration environment today and with specific reference to the South African scenario, the masses of information contained within the information technology databases are not applied for executive managerial purposes. Executive information is required not only for decision-making but also for the purpose of formulating and implementing policy in order to improve governance. In most instances this information cannot or will not be applied, as the staff is not equipped (trained) on the one hand or the systems that contains the data are cumbersome and the information contained in various files and formats (Interview with Director Department of Defence Logistics Support Formation, Department of Defence, 2000).

On the other hand very relevant information contained in some governmental databases is privileged to the extent that it may not be made available to other government departments. As an example serves the very large and accurate Independent Electoral Commission (IEC) voter database that for ethical reasons may be neither viewed nor accessed by any other state department. (This excludes the operational or line function, which assists voters to check their details.) This constraint on access is because of the **Electoral Act, 1998** (Act 73 of 1998) and a Code of Ethics passed regarding the privacy of confidential information (interview with the Manager Voting Station Infrastructure and Electoral Logistics (Chief Director), Independent Electoral Commission, 1999).

The State Information Technology Agency (SITA) has under its management a large amount of information not being utilised to optimise executive management but rather conclude the line function of the departments it manages the information for (Interview with the previous Director Commodities and Services, 2000; Director Department of Defence Logistics Support Formation, 2000). To this extent the Department of Defence (South African National Defence Force), serves as an example in that the corporate database contains all information pertaining to the personnel, financial and logistical activities in terms of the line function of the Department of Defence. However, in order to retrieve executive management information, additional and costly programs have to written to retrieve said information (Interviews with the previous Director Commodities and Services, Department of Defence, 2000 and the Director Department of Defence Logistics Support Formation, Department of Defence, 2000). Interesting to note that at this time, much of this information is not integrated thus the personnel section is not utilised to·supplement the logistics database. There exists some integration between the financial information system and the logistical information system, purely from a

point of view to pay for services rendered (such as procurement) (Interview with the previous Director Commodities and Services, Department of Defence, 2000; Director Enterprise Information Systems Architecture, Department of Defence, 2000 and the Director Department of Defence Logistics Support Formation, Department of Defence, 2000).

The South African scenarios for the application of electronic government and governance has advanced further, faster than most foreign countries. South Africa has due to its constitutional commitment accepted the responsibility to make as much as possible of the democratic process visible to as many as who would want to know. In the process, the commitment to informational databases where *de facto*. The database commitment, *ipso facto*, implied utilising the information age and implied herein the information technology available to present to all that would want to know the democratic facts of South Africa.

The **State Information Technology Agency Act, 1998** (Act 88 of 1998) had as its aim to:

> *"Provide for the establishment of a company that will provide information technology, information systems and related services to, or on behalf of, participating departments and in regard to these services, act as an agent of the South African Government; and to provide for matters connected therewith."* (Government Gazette, 1998).

The **State Information Technology Agency Act, 1998** (Act 88 of 1998) had to create an environment within which the department will feature as the host to the accumulation of (transactional) data by which the department can manage itself. This management would have as aim to formulate and implement policy. However, transactional data cannot be utilised in isolation for the formulation of policy, as executive

management information is required to for decision purposes. Executive information in turn is derived from transactional data.

The establishment of the State Information Technology Agency paved the way for an already growing application of information available to the general public with regards the doings and functioning of South African Government. Prior to the implementation of the **State Information Technology Agency Act, 1998** (Act 88 of 1998), numerous (prosperous) provincial and local governments had web-pages set-up to enlighten the citizenry with regard the governmental functioning. The integration and data management of these sites could now be realised.

The State Information Technology Agency, together with the Department of Telecommunication, was given the task of not only bringing information to the citizenry in general but to establish a telecommunication infrastructure to support and maintain this. The telecommunication infrastructure requirement led to a tender being issued under upgrade the South African governments' information system infrastructure. This tender requested the supply and installation of computers and related equipment amounting to approximately R12m by the State Tender Bulletin on 3 July 1998. The aim of this tender was to provide the ten legislatures (National Parliament and the nine Provincial Legislatures) with an Information Technology infrastructure, office systems and connectivity. The legislatures would then build on this infrastructure using their own resources. Information Systems managers have been appointed at each legislature to optimise the use of the new technology. The development of information technology systems within and between legislatures will enhance access by members, staff and citizenry to key information, and will facilitate increased public access to legislative institutions. The purchase of the equipment was to be funded from the European Union Parliamentary Support Programme as part of the European Union funded

parliamentary support programme of R86 million. This support programme was initiated to assists with the training of members and staff, departmental development, public participation, and the employment of key support staff in each legislature (Naidoo, 1998 [WWW document]).

As part of the communication upgrade of the South African Parliament announced that an information strategy (issued by the Department of Post and Telecommunication on 4 March 1998) would be put in place. In essence this framework proposed the development of a national information and communication technology strategy for all three spheres of government. The key elements of the strategy were:

a.   Improving the technology capability of government through the creation of a number of technology projects of which the foundation will be a high-speed fibre optic backbone.

b.   Improving service offered to all citizens by offering a one-stop shop through the use of smart cards and public information terminals.

c.   Developing legislation on cyber laws such as digital signatures and encryption that will allow e-commerce to become a reality.

The use of information technology would allow government to offer and efficient an effective standardised service to citizens in all areas on a 24-hour basis. This will be done through the introduction of public information terminals and community information centres.

The then Posts, Telecommunications and Broadcasting Minister, Jay Naidoo, said:

The result of this will be a much more dynamic interaction between government and the people and see a substantial reduction in bureaucracy. We want to see an increase in government efficiency

and effectiveness and in so doing, reduce corruption and fraud and improve ordinary people's access to government information. (Naidoo, 1998 [WWW document]).

It is not yet clear whether there is improvements in interaction, as many South African's still do not have access to basic amenities such as telephones and electricity. Furthermore, it is difficult to determine whether there is an improvement in effectiveness and efficiency as departmental baseline statistics against which the improvement was to be measured, is not known. Cabinet approval meant government could begin the task of co-ordinating the development of the strategy as well as individual projects to be introduced in the short, medium and long-term. Lastly, crime statistics on white-collar crime still indicate a high level of corruption and fraud.

The Department of Communications will also convene an investment cluster on information and communication technologies. This would include the departments of Trade and Industry, Arts, Culture, Science and Technology, Public Service and Administration, Finance, Public Enterprises and Justice. A further aim is to prepare legislation for electronic commerce, such as on-line procurement and tender submission (e-commerce), encoded signature for electronic documents (digital signature), on-line interaction and report exchanges (multimedia convergence) and coding/decoding for security purposes (encryption), as a priority. The cluster must also establish a committee to look into the development of a multi-purpose smart card. The smart card could then be utilised for identification purposes access to the government sites and elections, as the card will contain all the bearer personal information. Research and development of key applications for the one-stop shop and citizens on-line would be the resultant outcome. The Minister further announced that the development of a government on-line and Intranet (for government) and all applications to facilitate the development of a one-stop shop for government services using the

fibre-optic backbone developed by Telkom, would be implemented. (Naidoo, 1998 [WWW document]).

It is interesting to note that the government also considers the financial implication of this action in that the Minister reported that:

> *A cost benefit analysis will be developed by my office and presented to the budgetary committee during the next budgetary cycle* (Naidoo, 1998 [WWW document]).

Similarly during the 1999 elections a virtual satellite (V-Sat) infrastructure as well as an Intranet (an internal Internet to the Independent Electoral Commission) was developed by the Independent Electoral Commission to facilitate the 1999 National elections (Interview with Programme Director, Independent Electoral Commission, 2000 and Independent Electoral Commission World Wide Web). This infrastructure and on-line capability not only allowed the elections to be conducted in a real-time mode but also to have all results verified within seconds.

3.16   Conclusion

Electronic government and governance is about communication, agenda setting and the application of a new medium, to wit the information technology available, to improve the executive management capability of the public office-bearer. As the telephone, the tele-fax and television made major in-roads in the political spheres so too, the information technology age.

A hundred years ago applying the telephone to communicate world occurrences was as futuristic as the concept of electronic government and governance. The point to ponder upon is not the medium *per se* but the democracy involved.

Then again, the electronic age with its technologically advances, have as much to offer as the industrial age. It is not computers *per se* but rather the totally integrated information and communication age that offers the new horizon. The information age and the technology advancements are there to optimise speed and efficiency.

Aspects that are yet to be addressed with regard the purist sense of the application of information and technology is the utilisation of this medium after an election campaign. This is as yet to be utilised to its fullest. As yet no studies have been conducted on this topic after application.

Education of the masses, inclusive of all population groups, is essential to make the information era work. Compulsory computer literacy classes and special educational work sessions for adults should facilitate this issue. The practicalities of this might be hinder-some as many refuse to become computer literate. This will limit the growth of the electronic village concept especially in the South African scenario.

The consideration, however, is that public access to government information is important in terms of the functioning of government. This is with regard to citizen participation. Promulgated acts, which determine the limitation of public access and the disclosure of information by the state, should alleviate the potential friction with regard what is disclosed and what is not.

A key policy requirement is the achievement of a national communications infrastructure, essential for social and economic activity. This is important in a world where reliable and speedy communication is vital.

Problem-areas that need to be addressed are:

a. The high illiteracy levels that are dominant the demographic profiles of (mostly) the rural communities in South Africa.

b.   The high incidence of crime such as theft of copper wire.

These may seriously impede efforts to establish electronic communities in the rural areas.

What is interesting to note is that the integration of an international community in terms of integrated Free-Nets and Digital Cities are now spanning the globe. This implies that an international medium might not be so far off. Interesting is that major governments (United States of America, Western European and Asian) are participating in this scenario.

Furthermore cognisance should also be taken of those aspects, such as, geographic information service that support computer technology in agenda setting and influencing, and integrate the functioning of these components to achieve both political freedom and political strength in the age of the new democracy.

Finally the comment could be made that in the international Public Administration and Management domain, masses of data are gathered by millions of civil servants and stored in databases primarily residing on mainframe computers. In order to retrieve this information or more correctly data, specialists such as computer programmers are required to write very specialised programs in order to conform to the requirements of management for executive management information. In actual fact, systems should be designed to accommodate the executive management information requirement without revering to secondary programming techniques. At this point, due consideration must now be given to national and international trends.