CHAPTER 5

RESEARCH FINDINGS OF INFORMATION MANAGEMENT AND TECHNOLOGY IN RELATION TO THE DRIVING FORCES AND DENOMINATORS

5.1 Introduction

The preceding chapter dealt with the national and international trends in the arena of the information management and technology. The research was done against the backdrop of the problem as postulated earlier in the thesis (*Supra*. Chapter 1, par. 1.3.1). This chapter interprets the empirical findings and validates these against the empirical findings based on the research parameter and objectives of this thesis (*Supra*. Chapter 1, par. 1.3.2). Thereafter it will be possible to draw conclusions and make recommendations that will effectively address the problem as postulated. In as much, a proposed model to overcome any issues found will be postulated.

This chapter is structured around the applicability of the aspects as defined by the research done, deductions based on the aforementioned, the necessity of employing the missing theoretical points or drivers and forces, a conclusion regarding the comparison and a summary to the chapter.

5.2 Background to the research findings

With regard the presupposition of this thesis, it needs to be again stated that management comprises two aspects that, when in harmony, comprise the concept management. These two aspects are, firstly, 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. Secondly, executive management information required for the future strategic planning and positioning of the department as well as potential policy formulation and eventual implementation for the department.

The focal objective of this thesis is to determine what the management solutions for the public sector should be, based on the application of information management and technology to be applied in the formulation and implementation of policy. The problem statement and objectives of this thesis, will therefore be the basis of departure (*Supra*. Chapter 1, par. 1.3.1 and 1.3.2).

Denominators (the transversal elements) that stem from this problem statement and which form an integral part of the problem will be addressed in the findings. They are:

a. The consideration that research was done to determine the type of application of information management and technology required for the formulation and implementation of policy in the public sector. Research has to be done prior to implementation and continued after implementation. It needs to be sufficient to facilitate the implementation thereof in the complex service oriented environment of the public service.

b. The determination of the element of economical viability is of fundamental importance as it is of no use that information technology is deployed for any purpose but cannot be sustained in terms of a financial ability. This could be in a self-maintained or outsourced capacity. The formulation and implementation of policy should also be based on the economic viability of such a decision.

c. The maturity or immaturity level of the users as well as the contractors implementing or developing the information management and technology systems for policy formulation and eventual implementation need to be investigated so as to determine successful implementation of both the information management and policy possibilities.

d. Confirmation need to be obtained that departments are in a situation to facilitate the total upgrade of information technology or have an infrastructure in place to facilitate implementation of information management and technology systems. Alternatively, that the existing information management and technology systems is of such standard as to support management needs and policy formulation and implementation needs.

e. Determination that communication of the new concepts for electronic based formulation of policy and implementation thereof for government and governance are done both horizontally and vertically in the public service as this is considered a necessity for successful acceptance and utilisation.

Also to be validated are the defined primary drivers and secondary forces, which form an essential part of the information management and technology concept (*Supra*. Chapter 1, par. 1.3.2). The primary drivers are:

a. Determination of the relevance of having availability of information and technology. Determination of the degree cognisance is taken of this driver and whether there is any actual improvement in availability and application of executive management information after implementation. The information availability is not only required for executive decision-making but also for the possible formulation of policy within a department.

b. To determine the influence cost reduction/cost avoidance have on the implementation of executive information management and technology required for the formulation and implementation of public sector policy and to determine the realistic expectations of this driver on the functioning of the public service after implementation.

c. To determine whether the effectiveness and efficiency of a department had improved with the utilisation of applied executive information management and technology required for the formulation and implementation of policy after implementation. Furthermore, whether this need is considered when the decision is made to apply the methodology of managing and designing policy through the application of information and technology.

d. To determine to what degree all participants in the applied information management and technology environment, required for the formulation and implementation of public policy, recognise the others' performance measures and measurements both prior to and after implementing information management and technology solutions. Also to determine whether new or modified performance parameters are required.

e. To determine to what extent management should be involved in the decision to implement and technology required for the formulation and implementation of public policy, and to what degree the management is effected by the decision. Also to determine how management of the department must be adapted for the information management and technology environment required for policy formulation and implementation, and what impacts should be considered or expected.

The secondary forces are:

a. To ascertain whether the human resources element plays any significant role in the decision to apply information management and technology for the establishment of electronic government and governance. The degree of cognisance that should be taken of this element during the phasing in of applied information management and technology required for strategic policy formulation and implementation, will also be ascertained.

b. To determine to what degree culture should be investigated or taken cognisance of when the decision to apply information management and technology required for strategic policy formulation and implementation has been taken.

c. To determine to what degree the application of applied information management and technology for formulation and implementation of public policy necessitates a new training curriculum at all levels and, what is the effect on the knowledge base of the existing public servants.

d. To ascertain what degree of control at all levels are gained or lost when implementing applied information management and technology required for the formulation and implementation of public policy.

e. To determine to what degree, if any, the departmental structures should adapt after the implementation of applied information management and technology required for the formulation and implementation of public policy. This will also imply that current procedures should be adapted to facilitate the new concept if it truly is unique.

5.3 Research findings

This section will deal with the analysis of the empirical research against the backdrop of the drivers, forces and denominators in order to determine to what degree success is, was or will be achieved. These findings will be supported by specific evidence from the cited examples. The evaluation will be explained by addressing firstly the drivers and forces and then the denominators. Due to the topic of this thesis and the aim thereof, it is only logical to explain the concept of management at the onset.

5.3.1 Drivers

The five drivers that will be considered are management, availability of information and technology, cost reduction/avoidance, effectiveness and efficiency and, performance measure and measurement.

5.3.1.1 Management

Management was considered the most important driver and the research had to determine to what degree management was affected by the implementation of information management and technology systems. Also, and probably more importantly, to what degree is management applied with the implementation and application of information management and technology systems. Herein lies the fundamental difference of transactional management and executive management information and the application thereof in the departmental environment in order to maximise efficiency and effectiveness in the public sector required for policy formulation and implementation (*Supra.* Chapter 2, par 2.3 and 2.4).

The Jordanian example is very specific in the fact that information technology was implemented to improve management capability but

does not reference the possibility of policy formulation to the benefit of the populace. This can be deduced from the following:

> *...that no large or complex public organisation, nor the administration and management of the social and economic programs of such organisations, is possible without information technology* (Supra. Chapter 4, par. 4.2.1).

Furthermore, that the implementation of information technology should adapt and should influence management and the way decisions are taken. The following supports this:

> *....that a supportive environment and skilled staff in a political stable climate are critical pre-requisites for the success of information technology application* (Supra. Chapter 4, par. 4.2.1).

From this example it also becomes clear that in the Jordanian case, management was aimed at transactional management and not focussed on executive management information or the potential input for policy formulation, implementation and monitoring. The following is in support of this:

> *Although mention is continuously made of improving organisational management most of these technology implementation reflect a focus on improved line function (doing the job better)* (Supra. Chapter 4, par. 4.2.1).

Ahmed, et al. (1998:121), quoting Wilson, also found that management was more involved in information technology for improved administration (Ahmed, et al., 1998:121 and Supra. Chapter 4, par. 4.2.1).

The Mexican example is not clear on the issue of management change or adaptation. It may be deduced that the implementation of information technology was focussed firstly on the improvement of data

management and secondly on transactional management with, again, no focus on the executive management capability available and, therefore, no focus on the input management information would or could have on policy formulation. The following supports this:

> ....*developing nature of the Mexican information technology, and the absence of hardware the Internet was a solution to be followed in order to improve government management capability* (Gutierrez, *et al.*, 1999:23 and *Supra*. Chapter 4, par 4.2.2).

In the Chinese example it is clear and conclusive that management had to adapt and improve on public service management but no reference to improving policy formulation nor the management of implemented policies exist. The following supports this:

> ...*was a shift in responsibility for business planning and economic performance from government to the top management of Chinese State Enterprises (CSE's)* (*Supra*. Chapter 4, Par 4.2.3).

This was referred to as the contract-responsibility system wherein managers were given the responsibility. Again the transactional and not the executive information management comes to the fore. The following supports this:

> ....*the managers had to meet their agreed on targets or performance objectives but in exchange got total autonomy to re-invest residual income* (Dologite, *et al.*, 1998:113 and *Supra*. Chapter 4, par. 4.2.3).

In the Californian example the need by management and for management is evident from their decision to implement information technology as a solution provider. It is not clear what management participation was or to what degree management change occurred. This is inductively concluded. The following substantiates this:

...explore the methodology deployed by a number of Californian municipalities to embrace the concept of on-line public service (*Supra*. Chapter 4, par. 4.2.4).

And further:

This might not necessarily be public management but certainly encompasses improved public service with the application of available data (therefore transactional activities) (*Supra*. Chapter 4, par 4.2.4).

From this example the transactional management capability, in order to improve on service delivery was first and foremost. The need for improved and executive information may have been considered an essential element for policy formulation or implementation. This may be concluded from the following:

The Californian approach of 'smart communities' actually required from their citizenry, to become informed in order to effectively participate in the public policy process (*Supra*. Chapter 4, par. 4.2.4).

Also:

...(in) a smart community any form of co-operation among counties, individuals, governing institutions.... the common aim that fundamental and not incremental changes should be effected. In this point of view management of the participating environment is addressed. (Caves, *et al*., 1999:6, and *Supra*. Chapter 4, par. 4.2.4).

From the interviews conducted with the SANDF staff it became clear that management was affected by the decision to implement information management and technology systems as a solution provider but that it did not enhance policy formulation *per se*. It was also clear from both, the Director Enterprise Information Systems Architecture (2000) and the previous Director Commodities and

Services (2000), that a resistance to change factor was present from the onset. The resistance to change problem, however, improved with time. According to both of them, the adaptation of management style and technique was essential in the management cadre of the Department of Defence, in order to optimise the data management capability. The Director Department of Defence Logistics Support Formation (2000) stated that at this time he is still not sure whether the total management cadre optimally applies the transactional management capability of the implemented solution. The potential capability of executive information according to the Director Department of Defence Logistics Support Formation (2000) also did not lead to improved policy formulation within the Defence environment.

The Director Human Resources (1999) stated that many senior (Department of Defence) management officials still do not use the computers (information technology) and data (transactional) to their benefit. The previous Director Commodities and Services (2000), stated categorically that no Department of Defence system was design or implemented to support executive management decisions hence no derived policies could be formulated from information gleaned from the existing databases. The interviewee was adamant that they supported only the transaction management level and even at this level it was not applied fully. The Director Human Resources (1999) stated that the management problem was exacerbated with transversal system like the PERSOL (personnel and salary) system. The previous Director Commodities and Services (2000), in his response, supported the point of view of the transversal systems. The Director Enterprise Information Systems Architecture (2000) stated that in the current Department of Defence environment, major potential exists for the application of the data management into transactional management capability. This avenue is currently being explored with the application of (software) tools and some bespoke developments. According to the interviewee

the total architecture design or re-design will pave the way for the successful implementation of this action and future application of information management which might lead to policy formulation for this department.

In response to the question of executive management capability the Director Enterprise Information Systems Architecture (2000) was emphatic that this is addressed in the new design. The interviewee acknowledged that management will need to adapt to this and together with their normal Department of Defence courses and training is taught to utilise this capability to its fullest extent in the strategic management and planning environment. Also that future executive decisions and policy formulation would be based on information extracted from the integrated environment of Defence data.

The previous Director Commodities and Services (2000) stated that from a strategic management perspective, the adaptation to applied information management and technology systems will, in all probability, be the most difficult as most of this is done in a manual mode. The Director Human Resources (1999) was of the opinion that, until such time as systems did not cater for the integrated support of strategic planning, they will not be used. *De facto* this implies that the formulation of internal policies will also not occur. The Director Department of Defence Logistics Support Formation (2000) stated that until information management and technology systems was refined to a situation of integrated supportive (executive) management tools at various levels, and data management for transactional management at others, management would have problems in applying an executive management capability. Again the *de facto* implication is given that no policy formulation based on available, albeit raw data, will be made.

In the Independent Electoral Commission example, the change in the management perspective was not so profound as management

accepted that they have to apply the information management and technology tool in order to execute free and fair elections (Interviews with Manager Voting Station Infrastructure and Electoral Logistics, 1999; Assistant Manager Electoral Logistics 2000 and Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000). Herein the interviewees acknowledged the fact that policies for the election had to be formulated based on information gleaned from the databases of the Independent Electoral Commission. In the Independent Electoral Commission example the respondents had much the same to say about the executive capability of the systems deployed. The Manager Voting Station Infrastructure and Electoral Logistics, (1999), the Assistant Manager Electoral Logistics (2000) and the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000) were all of the opinion that data manipulation for executive decision-making occurred outside the implemented information management and technology systems. The three respondents all supported the notion that the systems implemented supported transactional level management and, in general, were excellent data warehousing tools. They all agreed that although applying tools such as Microsoft Access™ to manipulate or statistically infer data, the ideal would have been to perform (executive) data analysis by applying the implemented systems. With regard to the logistical system implemented to support the electoral process, the Project Manager Electoral Logistics System (2000) supports this notion. The system was excellent in terms of transactional needs and produced excellent reports on progress and inventory statuses as well as distribution progress. Executive management capability and the resultant policy formulation based on these results were, however, limited to inferring this information with various other databases and planning outside the system. The policies applicable to the Independent Electoral Commission's logistical environment were however not deduced from the available information technology base.

The Director Procurement (1999) from the procurement division stated that his executive information originated by maintaining manual methods. The interviewee concurs that the implemented financial system supported his division in the transactional management capacity to the ultimate extent. All respondents agreed that executive information in terms of strategic planning needs to be obtained from the systems deployed. All too agreed that in the case of the Independent Electoral Commission, executive management strategic planning had occurred and that information management and technology had been applied but did not assist them as an integrated solution in formulating voting policy. The formulation and eventual approval of electoral policies was done outside of the available information database on an individual expertise level (Manager Voting Station Infrastructure and Electoral Logistics, 1999).

From the perspective of the Department of Justice and the interviews with the Deputy Director General Corporate Services (2001), it became clear that management would have to adapt dramatically to the new approach of applied information management and technology. According to the interviewee, at the time of the launch of the Digital Nervous System project less than one third of the department had access to computers and the related information management and technology. Management is virtually completely based on manual methods with some applications of Microsoft Access™ and Excel™ spreadsheets. One of the biggest problems being experienced is that the deployed systems are not being utilised to the fullest extends. All existing systems are aimed at resolving transactional needs and these are limited to the transversal government systems such as PERSAL (personnel and salaries) and LOGIS (logistics information system). The Director Information Technology (2001) responded that information management and technology and the implementation of a system such as the integrated case process systems would have far reaching impact

on the existing management structures of the department and future policy formulation for the department. Both the Deputy Director General Corporate Services (2001) and the Director Information Technology (2001) were of the opinion that the management cadre of the Department of Justice would have to adapt dramatically to the changing environment.

In response to the question whether the new system cater for executive information and eventual formulation of policy for the department, the response from both the Deputy Director General Corporate Services (2001) and the Director Information Technology (2001) was an emphatic yes. So to was the response, not only of the Deputy Director General Corporate Services (2001) but also from the Director Information Technology (2001) regarding training. The Project Manager Digital Nervous System (2001) and the Project Manager Financial Administration System (2001) responded equally strongly that training at all levels within the department had to enjoy a priority in order to accept information technology as a management solution and eventual policy formulating body. The Deputy Director General Corporate Services (2001) was of the opinion that any solution implemented in the Department of Justice should be of such a nature to supply management with the required management information at all levels. This implies not only transactional management information but also executive management information. The interviewee was further of the opinion that this could not be done by one system (software solution), which could prove to be difficult but must be rendered seamlessly if provided by more than one system (software solution). This enlightened point of view places a different perspective on the statement of service provision and customer satisfaction as though was also given to the potential of policy formulation and implementation. In terms of executive management capability the Project Manager Digital Nervous System (2001) stated that for the management of the deployed infrastructure

statistical inferences were required to determine usage and downtime in order to determine systems dependability. The Project Manager Financial Administration System (2001) stated that statistical inferences were required with regard to cases, which is not currently available. These all point to the application of executive management information with the eventual aim to improve policy formulation within the department.

5.3.1.2 Availability of information and technology

Availability of information and technology was considered a driver due to the importance of data for management. The data integrity is also of great importance as decision based on corrupt data inferences will lead to bad decision-making and potential policy formulation. Furthermore the non-availability of data implies the incapacity to effectively manage an organisation or to execute policy formulation (*Supra.* Chapter 2, par. 2.3 and 2.4).

The literature research indicates that most management information systems focus on the private sector but that the public sector is the world's largest consumer of information technology. Government collects, collates and disseminates vast amounts of data (Claudle & Marchland, 1990 as quoted by Bajjaly, 1998:75). Given the research, it is clear that the public sector in general does have masses of data available.

In the case of the Jordanian example it is evident that initially (1977) no electronic data was available. However, as the computer infrastructure grew in its public sector information technology from having virtually no structure in 1970 to being the leader in the Middle East, the situation was reversed and accordingly Jordan amassed a great deal of data (*Supra*. Chapter 4, par. 4.2.1 and Ahmad, *et al*., 1998:119).

From the Mexican example the conclusion is that data is available but not all data is accessible due to a poor communication infrastructure. Data is also not accessible due to the Mexican political scenario, which still maintains an authoritarian view on information availability. This, in turn, would result in the inability to deduce policy from existing information. This deduction is based on the following:

> *The main constraint still remains the lack of (communications) infrastructures.* (*Supra.* Chapter 4, par. 4.2.2 and Gutierrez, *et al.*, 1999:23).

From the Chinese example it is gleaned that in some government enterprises such as hospitals and harbours, relatively large amounts of electronic data do exist. However, due to the lack of an integrative system, duplication is at the order of the day. Also, not all public services are addressed by the drive to computerise and no integrative approach is followed thereto. In the general sphere then the Chinese do not have much electronic information in the general public service other than for the military, harbours and hospitals (*Supra.* Chapter 4, par. 4.2.3 and Dologite, *et al.*, 1998:119-120). In turn this result in the situation whereby the masses of information cannot be used to improve policy formulation.

The Californian example is one of true Western development and boasts the availability of masses of information even available to the public. In their approach of the smart community information pertaining to all service to be delivered and all municipal type information must be available on-line but no reference to implemented and executable policies are made (*Supra.* Chapter 4, par. 4.2.4 and Caves, *et al.*, 1999:7).

The interviewees in general accepted the fact that in most instances (for example the Department of Defence and the Independent Electoral Commission) massive amounts of data was collected and collated

electronically (*Supra*. Chapter 4, par. 4.3.2 & par. 4.3.3, and interviews with Director Enterprise Information Systems Architecture, 2000 and Manager Voting Station Infrastructure and Electoral Logistics (Chief Director), 1999). In the case of the Department of Justice, their recent move to computerisation, it state's that they do not have masses of electronic information other than those available from the transversal systems (*Supra*. Chapter 4, par. 4.3.4 and interviews with Deputy Director General Corporate Services, 2001 and Director Information Technology, 2001).

The overall conclusion that may be made with regards this section is that, in general, the public service does have information available. However, as is the case with Department of Justice, the transversal information is dominant with regards to the electronic configuration but that the executive information pertaining to the specific department will be absent or severely lacking thus inhibiting potential policy formulation based on such data and information.

5.3.1.3 Cost reduction and avoidance in the implementation of information management and technology

It needs to be re-iterated that cost reduction and avoidance with the use of applied information technology in the application of policy formulation and implementation is essential. Executive information needs for the formulation of policy needs to be derived from usable data of the various departments (*Supra.* Chapter 2, par. 2.3 and 2.4).

In the Jordanian, Chinese and Californian examples it is not conclusive that cost reduction or avoidance was a consideration for implementing information technology. All these examples cite various other reasons but do not mention cost as a driver (*Supra*. Chapter 4, par. 4.2.1; par. 3.2.3 and par. 4.2.4).

From the Mexican example it may be concluded that cost was a driver in the consideration for implementing information technology as a solution provider for the information management but not necessarily in the policy formulation context. This conclusion is based on the argument of Gutierrez, *et al*., (1999:23) as also presented in *Supra*. Chapter 4, par. 4.2.3 who stated that:

> *Due to the developing nature of the Mexican information technology, and the absence of hardware, the Internet was a solution to be followed in order to improve government management capability. This route was followed primarily because of the low cost implication.*

From the interviews conducted with regard to the South African examples, all respondents cited cost as a major issue (driver) when the decision to implement information management and technology was made. The Director Enterprise Information Systems Architecture, (2000); the Director Human Resources, (1999) and the previously Director Commodities and Services (2000) stated categorically that major design (and implementation) issues in the existing unique and transversal systems where decided on in order to optimise on the ever diminishing Department of Defence budget. All, however, were of the opinion that the masses of data were not utilised to improve the departmental functionality with proved policies.

The respondents interviewed at the Independent Electoral Commission also had cost reduction as a major issue (driver). Implementing information management and technology (for example upgrading personnel computers, local and wide are networks) at the Independent Electoral Commission had one aim and that was to ensure free and fair elections within the given budgetary constraints with the aim of reducing operating cost in the long run. Resultant cost reduction policies were in the offing but implementation thereof would be determined in a matter of time (Interviews with Manager Voting Station

Infrastructure and Electoral Logistics, 1999 and Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000.).

At the Department of Justice, improved effectiveness and efficiency was cited as being the most important, but both the Deputy Director General Corporate Services (2001) and the Director Information Technology (2001) were emphatic about the fact that operating cost of the department had to be reduced. According to interviewees, cost avoidance was of greater importance than cost reduction as cost reduction is not so easily attained in an inflationary environment. Both interviewees were adamant that, on completion of the proposed electronic solution, all management and policy issues within the department would be resolved.

5.3.1.4 Departmental effectiveness and efficiency

It needs to be re-iterated that departmental effectiveness and efficiency with the use of applied information technology in the application of policy formulation and implementation is essential. Executive information needs for the formulation of policy needs improve the departmental effectiveness and efficiency in terms of the stated service delivery required by the populace (*Supra.* Chapter 2, par. 2.3 and 2.4).

Departmental effectiveness and efficiency was considered a driver and the research had to determine to what degree organisations accepted the effect of this driver on the environment prior to, during and after implementation of information management and technology.

The Jordanian example cites that the improvement of effectiveness and efficiency was important but does not refer to policy in any way. The following argument of Ahmed, *et al.*, (1998:120) as also presented in *Supra*. Chapter 4, par. 4.2.1 supports this:

> *... the implementation of information technology in the public sector, especially in developing countries, was to improve efficiency and effectiveness in order to influence (on) how government agencies conduct business.*

It cannot be conclusively stated from the Mexican example that the improvement of effectiveness and efficiency was a dominant issue nor that information for the formulation of policy was foremost. From the following excerpt it becomes evident that the Mexican Government still has an authoritarian hold over management and might well overlook the improvement of effectiveness and efficiency in lieu of control. The following argument of Gutierrez, *et al*., (1999:30-31) as also presented in *Supra*. Chapter 4, par. 4.2.2 supports this:

> *The Mexican political scenario still maintains an authoritarian outlook on information availability. This in turn results in the lack of public policy to mandate access to governmental networks.*

From the Chinese example it becomes clear that if central government had wanted to improve of effectiveness and efficiency of their administration, this did not occur due to the legacy of inefficiency in the Communist management methodology with no intention of improving governance through improved policies. Furthermore the Chinese concept of hired staff with life-long employment implies the non-retrenchment of unproductive workers and leads to losses in revenue (Dologite, *et al*., 1998:113-115 and *Supra*. Chapter 4, par. 4.2.3).

It can conclusively be stated from the Californian example that the improvement of effectiveness and efficiency was a serious consideration when the decision to implement information technology was taken. In this example the point of departure was of empowering the citizenry with regard to public policy and implementation. The following excerpt illustrates this:

The Californian approach of smart communities actually required from their citizenry, to become informed in order to effectively participate in the public policy process (Caves, et al., 1999:5 and Supra. Chapter 4, par. 4.2.4).

Respondents from the Department of Defence example had different opinions regarding the aim of improving effectiveness and efficiency. The Director Enterprise Information Systems Architecture (2000) was of the opinion that implemented systems had as their aim to amongst others improve effectiveness and efficiency. The previous Director Commodities and Services (2000), however, was of the opinion that the initial systems implemented (mostly transversal systems) had as their major aim to improve data management. The Director Department of Defence Logistics Support Formation (2000) and the Director Human Resources (1999) shared this point of view as well. The previous Director Commodities and Services (2000) further stated that only after approximately 1985 did the Department of Defence design for improved effectiveness and efficiency. The Director Department of Defence Logistics Support Formation (2000) and the Director Human Resources (1999) where further of the opinion that very few of the systems ever designed improved effectiveness and efficiency. The interviewees stated that virtually all systems designed were curtailed by lack of funds. This makes this driver rather inconclusive from the Department of Defence's point of view but given the remarks of the Director Enterprise Information Systems Architecture (2000) and the previous Director Commodities and Services (2000), it could be stated that effectiveness and efficiency was given due consideration albeit not executed in terms of design limitations. Not evident, however, was improving effectiveness through improved policy formulation.

From the Independent Electoral Commission example, it was conclusive that the total systems design was for improved effectiveness and efficiency. The Manager Voting Station Infrastructure and Electoral

Logistics (1999) was clear on the fact that not only the logistics systems but also the total integrative voting systems were designed towards optimisation and improved effectiveness and efficiency. According to the interviewee and the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000), the integrated local and wide area network concepts and the method in which the elections were executed was designed for optimal time response with accuracy of information as the driver. The Project Manager Electoral Logistics System (2000), responding to the same question and with reference to the logistics system, stated that other than cost reduction, improving the electoral logistical process through improved effectiveness and efficiency, was the total concept and idea. The Acting Chief Director Security (2000), who was responsible for the security of the Independent Electoral Commission, had the same opinion with regard to the security measures and systems implemented. None of the Independent Electoral Commission staff or contractors interviewed had any other opinion other than being in support of this driver.

In the Department of Justice example it can also be conclusively stated that effectiveness and efficiency is considered a driver. Improving the justice system by improving the effectiveness and efficiency of the systems in delivering justice to all are of prime importance according to the Deputy Director General Corporate Services (2001). According to the Director Information Technology (2001) all systems currently under design or pilot testing are designed with the concept of improving effectiveness and efficiency of not only the systems but also the justice process. The Project Manager Financial Administration System (2001) responded in similar fashion, when interviewed, regarding the Department of Justice's financial administration systems. The Project Manager Digital Nervous System (2001), responsible for infrastructure deployment, stated that her mandate was explicit in terms of improving effectiveness and efficiency in both systems and service delivery.

5.3.1.5 Performance measure and measurement parameters

Performance measure and measurement parameters as an element was considered a driver and the research had to determine to what degree organisations recognised performance, performance measurements and performance measures prior to, during and after implementation. Organisations will have to know what it was improving, what milestones had to be achieved during implementation and what had to be improved on after implementation (*Supra*. Chapter 1, par. 1.3.2 and Chapter 2, par. 2.3 and 2.4).

The Jordanian example is not conclusive that measurements or measures, to indicate improvement were applied, prior to and after the implementation of information technology. In the Jordanian example it is deduced that measures and measurement parameters were put in place. This is supported by the fact that leaders in the Arabic countries accepted the changing environment in this field. Also that:

> *Although mention is continuously made of improving organisational management most of these technology implementation reflect a focus on improved line function (doing the job better)* (Ahmed, *et al*., 1998:121 and *Supra*. Chapter 4, par. 4.2.1).

The Mexican example is inconclusive that performance measurement or measures were a consideration. At this time the Mexican Government still have a great deal of problems in purely addressing the communication issue (Gutierrez, *et al*., 1999:20 and *Supra*. Chapter 4, par. 4.2.2).

The Chinese example is conclusive that cognisance of performance measurements and measures had been taken. This is based on the fact that the Chinese government moved to a system of Chinese State Enterprises (CSE) within a contract-responsibility system. This does not however, imply that the concept of Chinese State Enterprises was

successful in its implementation (Dologite, *et al*., 1998:113 and *Supra*. Chapter 4, par. 4.2.3).

The Californian example is conclusive that the driver performance measurements and measures had been taken into account when the decision to implement information technology as a solution was made. This is clear from the following statement in *Supra*. Chapter 4, par. 4.2.4:

> *The Californian experience is captured in the improved service delivery dilemma…..The Californian solution was one of embracing the information technology age in order to establish smart communities. …..The Californian local governments were forced to respond to the requirement of the constituents as the citizens had become frustrated over the lack of service at the various levels of government.*

The recognition of improved information infrastructure and technology for the improved service delivery of amongst others, health, justice, economic growth and education was of importance to the Californian solution (Caves, *et al*., 1999:4 and *Supra*. Chapter 4, par. 4.2.4). This is only possible if structures to measure against are available or built.

From the interviews conducted in the Department of Defence environment it became evident that in most instances performance measures and measurements were available before during and after implementation. The Director Enterprise Information Systems Architecture (2000), the Director Department of Defence Logistics Support Formation (2000) and the previous Director Commodities and Services (2000), were emphatic when stating that it would have been impossible to determine the improvement of the implemented information management and technology systems had it not been for some form of established measurement against which to measure enhancement. These established measurements and measures existed

in an environment where existing productivity improvement programs were running. The Director Human Resources (1999) differed slightly (being involved with transversal systems) by stating that initially no baseline measurements were available. These were developed as the implemented systems progressed. An interesting proponent of this driver was the Acting Chief Director Security, Independent Electoral Commission, who before his retirement, was the Director Logistics Operation (supporting all South African Air Force logistical operational activities), who stated that the concept of logistics for operation was based on knowing the performance parameters.

From the Independent Electoral Commission example it is gleaned that very specific performance measurement tools where designed prior to the implementation of the information technology drive. This had as a specific aim to measure performance enhancements during and after implementation with a specific focus on election results and electoral maintenance after the cyclic events. The Manager Voting Station Infrastructure and Electoral Logistics (2000) and the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000), during their interviews and discussions, were categorical in stating that the design for systems alone is not implementable but the measurement against standards and norms is. The Assistant Manager Electoral Logistics (2000) stated that, should systems within the Independent Electoral Commission have been developed against unknown criteria, the Independent Electoral Commission would not have known whether they are improving the electoral process. The Project Manager Electoral Logistics System (2000) stated that a department does not implement a system without reason, this reason being improvement of some action. In order to know and understand the requirement, the organisation has to measure this action. Again, the Acting Chief Director Security (2000) had an interesting comment to make in that in his environment there was

nothing to measure so anything that was done related to improvement. As a last statement in this regard it needs be stated that the Director Procurement (1999) reflects on the Independent Electoral Commission's performance enhancement vis-à-vis previous organisation the interviewee served at, as being at the forefront. It could therefore be concluded that the Independent Electoral Commission accepted performance measurements and measures as a driver.

In the Department of Justice example measurement against set criteria was at the order of the day. The Deputy Director General Corporate Services (2001) stated that the e-Justice programme was initiated against the backdrop of negative (justice) statistics and weak tools, which indicated that the Department of Justice had to follow the course of information management and technology systems implementation. This was the only solution to the justice systems critical backlog and poor conviction and other performance records. These poor results were the physical results in the court process as obtained from statistical inferences and administrational reporting (Ebrahim, 2001:6-9). The Director Information Technology (2001) stated that the Courts Process Project is measured against set parameters and the national rollout will also be measured against such parameters. In terms of the Digital Nervous Systems the Project, Manager Digital Nervous System (2001) was of the opinion that a classical case of stated measurement improvement during and after implementation was experienced. With regards to the financial systems being implemented, measurement to the non-tangible level of gender acceptance is measured (Interview with the Project Manager Financial Administration Systems, 2001). It could therefore be concluded that the Department of Justice accepted performance measurements and measures as a driver.

5.3.2 Forces (departmental elements)

The forces are those elements the department has control over. In the context of this thesis they are human resources, culture, training and skills development, control and departmental design (*Supra.* Chapter 2, par. 2.3 and 2.4).

5.3.2.1 Human resources

The human resources element as a component is important from the perspective of change management and the influence the implementation of a new form of management or even a transactional tool impacts on the human environment (*Supra.* Chapter 2, par. 2.3 and 2.4).

The Jordanian example is conclusive in that human resources were considered when the decision to implement information technology was made. The following argument of Ahmed, *et al*. (1998:118) as presented in *Supra*. Chapter 4, par. 4.2.1 supports this:

> *They are further of the opinion that a supportive environment and skilled staff in a political stable climate are critical pre-requisites for the success of information technology application.*

Neither from the Mexican nor from the Chinese example can it be conclusive deduced that the element of human resources was considered when the decision to implement information technology was made (*Supra*. Chapter 4, par. 4.2.2 and par. 4.2.3).

The Californian example highlights the human component from the perspective of the user:

> *The Californian approach of smart communities actually required from their citizenry, to become informed in order to effectively participate in the public policy process* (*Supra*. Chapter 4, par. 4.2.4).

Considering the Californian example the conclusion is drawn that the organisations did consider the human component of the resources element. The conclusion drawn, must be stated against the backdrop of the research being unclear as to the actual human resource element within the department (Caves, *et al*., 1999:5 and *Supra*. Chapter 4, par. 4.2.4).

During interviews conducted with regard to the Department of Defence example, the Director Enterprise Information Systems Architecture (2000), the Director Human Resources (1999) and the previously Director Commodities and Services (2000) stated that no consultation before implementation was done with the human resources element involved, at user level. A marketing drive during and after implementation was, however, undertaken. The three respondents did also state that the decision to implement any information management and technology solution was undertaken with consultation and detail briefing at senior management level. In this regard the change management was difficult to execute (Director Human Resources, 1999).

From interviews conducted at the Independent Electoral Commission it was apparent that this department embarked on a total change management program prior to implementation of information management and technology. Interaction with all levels at the Independent Electoral Commission was established and progress reports communicated monthly (Interviews with the Manager Voting Station Infrastructure and Electoral Logistics, 2000 and the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000). Forums for improvement and computer literacy training were established prior to system implementation and maintained after implementation (Interviews with the Assistant Manager Electoral Logistics, 2000 and the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000). New

systems where not implemented until the users were acquainted with the funcionalities (Interview with the Project Manager Electoral Logistics System, 2000).

The interviews and discussions conducted at the Department of Justice indicate that sensitising the staff (human resources) is one of the greater priorities at this time. Communication to all offices and staff informing them of the changes is undertaken prior to implementation and rollout (Interviews with the Deputy Director General Corporate Services, 2001 and the Director Information Technology, 2001). Training and feedback forums are in place and suggestions duly noted (Interviews with the Director Information Technology, 2001 and the Project Manager Financial Administration Systems, 2001). Where practically possible these may be incorporated as long as it supports the overall information management architecture (Interview with the Deputy Director General Corporate Services, 2001).

5.3.2.2 Departmental culture

Culture form the backbone of any department imperative that this be considered when implementing any form of transformation. The culture of a department is established through the functioning of its staff over many years. Should a paradigm shift in terms of management operating concepts or otherwise be implemented, this implies changing the existing culture to something new. In the case of the international examples consideration of this element could not be conclusively established (*Supra*. Chapter 2, par. 2.3 and 2.4 and Chapter 4, par. 4.2).

In the case of the Department of Defence example the previously Director Commodities and Services (2000) stated that no cognisance was given to departmental culture. It was assumed that the staff would adapt to the changing scenario. The Director Human Resources (1999) stated that no system implementation ever bothered about cultural

compatibility. New systems were designed and implemented without consideration as to the impact on the existing culture. Hence the resistance to change especially with regard to the transversal systems. The Director Enterprise Information Systems Architecture (2000) was of the opinion that departmental culture *vis-à-vis* the potential contractor's departmental culture was considered. This facet is also important within the contracting organisation human resources cultural acceptance with credible contractors and *vice versa*. The Director Department of Defence Logistics Support Formation (2000) stated that in his experience the design of systems, especially the transversal systems, never considered the impact on the departmental culture other than top management statements that it will improve productivity. Also, in most instances, culture was not a consideration when the decision to implement information technology was made, but rather a management decision. It may, therefore, be concluded that in the Department of Defence departmental culture was not a consideration when the decision to implement information management and technology was taken.

In the Independent Electoral Commission scenario the Manager Voting Station Infrastructure and Electoral Logistics (2000) affirmed that the departmental culture was of prime importance when the Independent Electoral Commission initiated the implementation of information management and technology. In all instances consideration was given to the impact at all user levels prior to implementation as well as establishing culture change programs to accommodate the transition. The Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000) was of the opinion that the Independent Electoral Commission went to great lengths to ensure that the cultural shock of the implemented (information management and technology) systems was minimised. The interviewee was especially praiseworthy of the designed and implemented plans to smooth the

cultural transition. The Director Procurement (1999) and the Assistant Manager Electoral Logistics, (2000) affirmed the comments of the Manager Voting Station Infrastructure and Electoral Logistics and added that in most instances a marketing drive prior to implementation of these systems was launched. During implementation, teams went out to assist users in the application of such systems, again to minimise the culture shock and assist in the culture transition. It may therefore be concluded that the Independent Electoral Commission did consider the impact of information management and technology on departmental culture.

The Deputy Director General Corporate Services (2001) of the Department of Justice, affirmed that the implementation of any (new) system is, and will be, accompanied by a drive to minimise the culture shock that was apparent when the Department of Justice implemented the transversal systems. These were not accompanied by culture change plans. The Director Information Technology (2001), the Project Manager Financial Administration Systems (2001) and the Project Manager Digital Nervous System (2001) supported this point of view by elucidating on the efforts their projects had made to sensitise the existing work environment. The Project Manager Digital Nervous System stated that as progresses with regard to implementation of other projects are made, the task is vastly easier. Major marketing and pre-implementation drives are undertaken to determine user susceptibility to the changing environment. These are supported by sensitising efforts to obtain user acceptance and management buy-in for the proposed and implemented systems (Interview with the Deputy Director General Corporate Services, 2001). It may therefore, be concluded that the Department of Justice does take the impact of information management and technology on departmental culture into consideration.

5.3.2.3 Training and skills development of personnel

Training and skills development at all levels of the department is imperative to transform a public department to a functional and manageable service oriented entity. Due to the changing environment and needs of the public domain, the need to change and adapt to the fast track of the information age implies that all levels of management and functional application are required to be adapt at the use and application of information management and technology. In the case of the international examples consideration of this element could not be conclusively established (*Supra* .Chapter 2, par. 2.3 -2.4 and Chapter 4, par. 4.2).

In the case of the Department of Defence, the Director Enterprise Information Systems Architecture (2000) stated that the Department of Defence did embark on a major drive to educate and empower the users of the systems. This was imperative if the deployed systems were to be used to their design capacity. The previously Director Commodities and Services (2000) stated that during the design of the previous (information management and technology) systems little training was initiated. Only during and after implementation was training initiated. This obviously contributed to a situation were the users were slow in applying the capabilities of the systems due to lack of knowledge of the systems. The Director Department of Defence Logistics Support Formation (2000) stated that transversal systems had continued training as the systems were updated and as new staff joined the service. According to him it must be assumed that training always formed a fundamental base when implementing information management and technology as a solution. The Director Human Resources (1999) stated emphatically that where knowledge transfer was identified prior to implementation of (technology) systems, such training was initiated with the co-operation of the developers. The interviewee supported the comments of the Director Department of

Defence Logistics Support Formation (2000) in terms of continuous training. It may therefore be deduced that the Department of Defence did apply training as a skills provider before, during and after implementation.

From the Independent Electoral Commission perspective, the Manager Voting Station Infrastructure and Electoral Logistics (2000) stated that in all instances were systems where implemented, the Independent Electoral Commission did not only sensitise the staff prior to implementation, but actually enhanced their skills by implementing a computer literacy training plan before training the staff on the system. The Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000) stated that from the Independent Electoral Commission's inception, to the first national election in 1999, senior management of the Independent Electoral Commission, had it as an imperative, to train all applicable staff, inclusive of management, in the use of the (information management and technology) systems that would be required to run the election. The Project Manager Electoral Logistics System (2000) stated that as an implementation guideline for the logistics system, training and skills transfer at all user levels (inclusive of management) were essential. The Assistant Manager Electoral Logistics (2000) stated that in his mind, the Independent Electoral Commission was an example of a public service organisation, which had the right approach with regard to the training and skills transfer approach to implemented information systems. The Director Procurement (1999) stated that although their procurement system was very manual oriented, they to embarked on a training and skills transfer course with very positive results with regard to their functional tasks. It may therefore be deduced that the Independent Electoral Commission did apply training as a skills provider before, during and after implementation.

From the Department of Justice interviews it was apparent that the training component did not enjoy attention when implementing transversal systems. In these cases training only occurred after implementation. This resulted in resistance to change being experienced (Interview with the Deputy Director General Corporate Services, 2001). The newly designed systems and proposed systems are however being designed with the training needs in mind. Training design is done with both the functional or transactional need in mind as well as the management needs based on these activities (Interviews with the Director Information technology, 2001 and the Project Manager Digital Nervous System, 2001). In the case of the integrated case management system (ICMS), specific data retrieval and management reports are standard in the design of the system to accommodate the improvement of the justice system to the people at grass roots level (Interview with the Deputy Director General Corporate Services, 2001). As part of the existing project budgets a substantial portion is used to facilitate the need for training (Interviews with the Project Manager Financial Administration Systems, 2001 and the Project Digital Nervous System, 2001). Both interviewees and the Director Information Technology (2001) did, however, state that training and the rollout of systems have to be carefully dovetailed (managed) so as not to train now and have to retrain prior to implementation, especially when timelines slip. It may therefore be deduced that the Department of Justice did apply training as a skills provider before, during and after implementation, qualified to new systems only.

5.3.2.4 Control

The importance of the element control in the implementation of information management and technology in a public service environment is not simplistic as it interfaces with aspects such as culture, training and organisational design. However, in most instances users at all levels are of the opinion that control is lost when

implementing information management and technology as a solutions provider. At management level management should consider the fact that they actually have better control over their functional arena than before. This perception is, however, not always appreciated (*Supra.* Chapter 2, par. 2.3 and 2.4).

From the international examples quoted it could not be clearly and conclusively deduced that control was a consideration. Possible exclusions are the Chinese and Californian examples. Nothing explicit is stated but rather implied hence no supportive quotes (*Supra*. Chapter 4, par. 4.2).

During the Department of Defence staff interviews it became apparent that control was of importance when consideration was given to the implementation of information management and technology. The Director Enterprise Information Systems Architecture (2000) stated that the implementation of information management and technology was considered of prime importance due to the fact that management control would be improved. The previous Director Commodities and Services (2000) stated that control of the (transactional) information was of prime importance at the time of implementing the unique systems. The interviewee acknowledged the fact that executive information was considered to be the same. At this time the previous Director Commodities and Services (2000) also acknowledged the fact that there is a vast difference between the need for the various management information requirements. It can therefore be stated that the Department of Defence example had as their aim to improve management control when the decision to implement information management and technology was taken.

The Manager Voting Station Infrastructure and Electoral Logistics (2000) from the Independent Electoral Commission stated that for their Department, it was imperative that control in general, and management

control specifically, had to be improved with the implementation of an information management and technology solution. This was then attained in the main electoral fields of operations as well as the support functions. With regard to the financial systems implemented they improved the financial control and the Independent Electoral Commission obtained a virtual clean bill of health during their annual audit. With regard to the support and operational logistics systems, both contributed to the success of the national and local election and made it possible to procure, store, distribute and roll back all the electoral equipment so identified (Interview with the Manager Voting Station Infrastructure and Electoral Logistics, 2000). The Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000) stated that the control aspect was paramount at the outset of the electoral process, but had to be augmented with the information management and technology implemented. This the interviewee said was attained as for the first time election readiness was monitored and controlled with regard to the logistics of the effort. The Assistant Manager Electoral Logistics (2000) confirmed this point of view. The interviewee stated that the total control allowed by the implemented systems enabled the Independent Electoral Commission to publicly, and in real-time, submit, not only results within 24 hours of the election, but also to compile a voters role within the short span of time of three weeks. The Project Manager Electoral Logistics System (2000), from the point of view of the logistics required for the elections, stated that the control over the process of item identification, procurement and distribution, was focal when the decision to implement the (logistics) system was taken. The Director Procurement (1999), from the procurement side, stated that the systems procured were thoroughly screened for conformance to control aspects. It can therefore be stated that the Independent Electoral Commission had as their aim to improve management control when the decision to implement information management and technology was taken.

In the case of the Department of Justice, the Deputy Director General Corporate Services (2001) stated that control over the case management of the court process is fundamental and non-negotiable with regard to the implementation of the technology solution. The aim of the system is to minimise court administration time, improve case turnaround time, minimise case (docket) losses, improve judicial application time and in general improve productivity. This control is only possible if control over the process is attainable and manageable (Deputy Director General Corporate Services, 2001). The Director Information Technology (2001), from the courts process project side, stated that the outcome of the pilot study was to ensure that the main objectives regarding the control objectives were met. The Project Manager Digital Nervous System (2001), stated that this project was responsible for the placing of infrastructure at all courts and, through this activity, enhance the control by the Department of Justice over the justice system. The Project Manager Financial Administration Systems (2001), responsible for the unique financial systems, stated that, apart form the various funds administered by the courts, the control and audibility of these funds are fundamental in the design of these systems. It can therefore, be conclusively stated that the Department of Justice had as their aim to improve control in general and management control specifically when the decision to implement information management and technology, was taken.

5.3.2.5 Departmental design

The need for organisational change within a department mainly after implementation of an information management and technology solution is a factor not always given due consideration. Due to the changing nature of the departmental functionality, an organisation should consider re-aligning itself with the changing environment. The re-alignment is required mainly due to the fact that various elements, not previously present, now start to manifest themselves within the

department. In this regard aspects such as computer helpdesks and management information kiosks might be required to assist the users and management in the application of the tools implemented. Due consideration must be given to the fact that one not merely computerises the mistakes of the past but improves on the existing scenario. This might lead to required changes in the departmental design. In the case of the international examples no clear consideration to departmental change, can be detected. In all instances the improvement in management capability is the only inference that may be made (*Supra*. Chapter 2, par. 2.3-2.4 and Chapter 4, par. 4.2).

According to the Director Enterprise Information Systems Architecture (2000), the Department of Defence did go through departmental change and adaptation after implementation of the information management and technology solution. The most noted of that was the integration of sections such as the stores and technical components regarding procurement and systems management. The Director Department of Defence Logistics Support Formation (2000) stated that within the broader Department of Defence environment, similar changes were initiated and implemented to accommodate departmental change requirements that resulted after management information systems were deployed. This was not linked to the transformation process that the Department of Defence went through during the late 90's (Interview with Director Department of Defence Logistics Support Formation, 2000). The previous Director Commodities and Services (2000) supported the Director Department of Defence Logistics Support Formation (2000) with regard to the departmental change as the interviewee had initiated the same within his directorate. The Director Human Resources (1999) stated that departmental change in his environment was not so profound as they dealt mainly with the transversal systems. It may therefore be stated that in the Department of Defence, departmental adaptation was not only considered a

requirement with the decision to implement information management and technology solutions, but actually implemented.

In the Independent Electoral Commission scenario, the organisation had the opportunity to start as a new entity in support of their information and management needs. Departmental adaptation was therefore not required after the implemented systems were operational (Interview with Manager Voting Station Infrastructure and Electoral Logistics, 2000). According to the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000), departmental adaptation was a build-in factor in the initial design of the Independent Electoral Commission, in order to retain flexibility, as was evident when the Independent Electoral Commission had to downsize after the 2000 local election. The downsizing, however, was not a result of the implemented information management and technology systems (interview with Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000). According to the Director Procurement, departmental adaptation was considered and implemented in the corporate service environment as a result of management needs and not systems implementation. It may therefore be stated that in the Independent Electoral Commission, departmental adaptation was a consideration during the design of the organisation but was not required when the information management and technology systems were implemented, as a result of good planning prior to operationalising the organisation.

The Department of Justice stated that with the implementation of information management and technology systems departmental adaptation and change was imminent (Interview with the Deputy Director General Corporate Services, 2001). The interviewee stated that the Department of Justice approved a departmental change to facilitate the need for a more process driven organisation, which included an information and systems business unit (Information and

Systems Management or ISM). The Department of Justice Board also approved re-structuring the department into manageable business units (for example Masters Offices, State Attorneys, Courts, Support Services and other functional justice entities). The Director Information Technology (2001), echoed the sentiment of the Deputy Director General Corporate Services (2001), with reference to the fact that the Department of Justice's information technology division (responsible for day-to-day information technology support) was to be integrated with the State information Technology Agency. Information technology services would then be procured from the State information Technology Agency on a contract basis. The Project Manager Financial Administration Systems (2001) and the Project Manager Digital Nervous System (2001), stated that their projects would not effect any other departmental change or adaptation not already contained within the information and systems management division. Their concern is the need for procedural changes that must be affected. It may therefore be stated that in the Department of Justice, departmental adaptation was not only considered a requirement with the decision to implement information management and technology solutions, but was also implemented.

5.3.3 Denominators

The denominators or transversal elements are research prior to implementation, economic viability of the implementation decision, maturity levels of the organisation, available information technology and communication.

5.3.3.1 Research

Research is critical in the user requirement design for the implementation of information management and technology systems. As these systems are usually costly, a wrong decision can amount to

major budgetary losses. The need for specific solutions must also be critically balanced against availability, applicability, sustainability and life cycle costs (*Supra.* Chapter 2, par. 2.3 and 2.4).

From the Jordanian example, the following statement highlights the factor that due consideration was given to the research element as reflected in *Supra.* Chapter 4, par 4.2.1 and by Ahmed, *et al.* (1998:118):

> *This was enabled primarily through the use of their (Jordanian) Royal Scientific Society, which is an active proponent of Information Technology. This society not only conducts research with regard to (management) requirements but also develops software for various applications in support of these requirements.*

Also applicable is the following statement as reflected by Ahmad, *et al.*, (1998:119) and *Supra.* Chapter 4, par. 4.2.1:

> *...the (Jordanian) Royal Scientific Society has conducted and concluded numerous studies and developments for various Jordanian public sectors inclusive of the Ministries of Justice, Foreign Affairs and the Department of Income Tax.*

From both the Mexican and Chinese examples it is not clear whether due consideration was given to the element of research at the time the decision to implement information management and technology was made (*Supra.* Chapter 4, par. 4.2.2 and par. 4.2.3).

Considering the Californian example, it is not clear whether they considered research. In the article it becomes apparent that research would have been undertaken in order for the Californians to attain their seventh place in world ranking economies. Also and as reflected in *Supra.* Chapter 4, par. 4.2.4:

The Californian solution was one of embracing the information technology age in order to establish smart communities.

The Californian local government where forced to respond to the requirement of the constituents as the citizens had become frustrated over the lack of service (Caves, *et al*., 1999:4 and *Supra*. Chapter 4, par. 4.2.4). It is therefore concluded that the Californians had undertaken research prior to implementing information management and technology.

The Department of Defence did not initially conduct research regarding the then primarily transversal systems. It was only after the implementation of unique systems (for example the logistics information systems) that consideration was given to research in terms of best practise (Director Enterprise Information Systems Architecture, 2000 and the previous Director Commodities and Services, 2000). This is found in the fact that the logistics system implemented in the South African Air Force was later procured by the Royal Air Force for their application. This, according to the previous Director Commodities and Services (2000), proves that the South African development was of the best standard in the world. The Director Enterprise Information Systems Architecture (2000) stated that information management and technology was at the forefront of (information management and) technology. The Director Department of Defence Logistics Support Formation (2000), affirmed that developed Department of Defence systems, required for (transactional) management, were of the best in the world and could be compared favourable with anything in existence. The Director Human Resources was more concerned about the transversal systems as these did not comply with individual departmental requirements and from his experience did not meet international or local management capacity or capabilities nor did they seem to have been well researched. During further discussion with both the previous Director Commodities and Services (2000) and the

Director Human Resources (2000), it was apparent that the absence of executive information management was their main concern and that this requirement was not researched at all. It may, however, be concluded that the Department of Defence did consider the denominator or transversal activity of research an important aspect in the design of information management and technology implementation albeit not for the use in executive information management.

From the Independent Electoral Commission example, and interviews with the staff, it became apparent that thorough research was at the order of the day prior to the inception of the Independent Electoral Commission with regard to the implementation of information management and technology (Interview with Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000). This is with specific reference to the fact that the implementation of information management (and technology) systems was decided upon prior to the launch of the new Independent Electoral Commission in 1996. The Project Manager Electoral Logistics System (2000) stated that research into the most applicable logistics solution was prevalent when the decision to implement a control mechanism was decided on. The Assistant Manager Electoral Logistics (2000) stated that research into the best and optimal solution was a consideration when the decision to approve systems for the Independent Electoral Commission was made. The Director Procurement (Electoral Commission, 1999) stated that in all procurement criteria the request was for optimising management and this then indicates that research into the best solutions for the Independent Electoral Commission was paramount. However, in none of the cases the express need for executive management information was considered. It may therefore be concluded that research was indeed an element that was given consideration by the Independent Electoral Commission at the time when the decision to implement information management and

technology as a solution provider was made but again without due cognisance of the executive information needs.

From the interviews conducted at the Department of Justice, research into the best solution for information management and technology was not only evident as a denominator in terms of the fact that all divisions and the department as a whole (Interview with the Deputy Director General Corporate Services, 2001). It was clear from the approach followed that any solution with regard to information management and technology had to comply with departmental requirements and had to comply with a life cycle expectation and (executive) management needs (Interview with the Deputy Director General Corporate Services, 2001). The Project Manager Financial Administration Systems (2001) stated that with regard to the systems implemented for the Masters courts, only the best practise was considered. In terms of the courts case management scenario the Director Information Technology (2001) stated that although the current consortium had the mandate to develop the pilot system, the department is continuously considering alternatives that might prove to provide better options. The Project Manager Digital Nervous System (2001) stated that with regard to infrastructure development standardisation on Microsoft Office 2000™ was decided on, however, any improvement in technology might lead to reconsideration of the original decision. It may therefore be concluded that the Department of Justice did consider doing extensive research prior to the implementation of the information management and technology concept. They also had an executive management focus regarding this need.

5.3.3.2 Economic viability

Information management and technology must under all circumstances only be considered if they are economically implementable and sustainable. This might for the purpose of this thesis imply that due

consideration might be given to outsourcing technology solutions as they are primarily not part of the core function and secondarily it may not be financially feasible to maintain such a service within the organisation. It also implies that systems should not be implemented if they cannot be maintained as this will lead to fruitless expenditure (*Supra.* Chapter 2, par. 2.3 and 2.4).

With regard to the international examples none but the Jordanian example cited economical reasons as a decision to implement information management and technology. This is derived from the following statement as reflected in Ahmed, *et al*. (1998:121) and *Supra*. Chapter 4, par. 4.2.1:

> *Referring to the Asian-Pacific rim countries, Ahmed found that computer technology was dependent on economic development.*

The Mexican example does refer to cost as an influence in the implementation of technology but does not refer to economical viability (*Supra*. Chapter 4, par. 4.2.2). It cannot be concluded that the international examples had economical viability as a primary consideration.

With regard to the Department of Defence, the Director Enterprise Information Systems Architecture (2000) stated that in all instances budgetary constraints forced the consideration of economically viability. In this regard the maintenance of implemented systems was always subject to the life cycle cost of such projects and the effect they would have on future budgets. According to the previously Director Commodities and Services (2000), no system (excluding the transversal systems) was considered unless a full life cycle costing had been done. This facilitated the accommodation of that such a system within the budgetary constraints of the department. According to the Director Enterprise Information Systems Architecture (2000) and the previously Director Commodities and Services (2000), some systems

were deliberately under developed due to the constraints of firstly developing them and secondly maintaining them. The Director Department of Defence Logistics Support Formation (2000) stated that in his experience all systems were subject to economical issues. No development could occur if no life cycle cost was presented. The Director Human Resources (1999) stated that in his mind it would be departmental suicide to design, develop and implement without due consideration to economical factors, especially life cycle costs. It can therefore be concluded that from the Department of Defence's perspective, economical viability was given due consideration albeit from a budgetary constraint perspective.

From the Independent Electoral Commission example, the Manager Voting Station Infrastructure and Electoral Logistics (2000) and the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000), stated that again, due to budgetary constraints, due consideration was given to economical viability. A further aspect according to these interviewees was the fact that the Independent Electoral Commission would have to sustain itself through a period of inactivity. According to them the Parliament wanted free and fair elections and motivation for funds for systems was difficult. The Assistant Manager Electoral Logistics (2000) stated that in all circumstances due consideration was given to the economical viability of possible systems. This according to the Project Manager Electoral Logistics System (2000) was especially true of the life cycle and applicability of the system after implementation and down sizing of the Independent Electoral Commission after the elections. The Director Procurement (1999) confirmed this sentiment as the investment and maintenance cost would have to be borne by a departmental budget severely cut between elections. It could therefore be concluded that due consideration was given to the transversal element economical viability, albeit due to budgetary constraints.

With regard to the Department of Justice, the Deputy Director General Corporate Services (2001) stated that consideration was given to economical viability. The interviewee also stated that if it were not for donor funding the departmental or budget vote would not have been sufficient for the transformation to an e-Justice environment. According to the Director Information Technology, much of the decisions, although politically initiated in 1997, were based on the availability of funds and *de facto* on the availability of funds for the maintenance thereof. This, according to the interviewee, applied to the broader integrated justice systems (IJS) as well. The Project Manager Digital Nervous System (2001) stated that from the perspective of the economical viability, infrastructure development, remains a consideration. Instance of no deployment has been registered, as scenarios were activities of support infrastructures inhibit these activities. Lack of communication infrastructure also acts as a hindrance on these sites and will therefore only be considered at a later stage. It may therefore be stated that the Department of Justice did consider the transversal element of economical viability as an important element prior to implementation of information management and technology.

5.3.3.3 Departmental maturity levels

Maturity level of a department (the level at which a department accepts growth potential) is indicative of the culture and departmental positioning in the information technology environment to accept change for improvement. The best systems can fail if buy-in from all levels is not attained. Furthermore, proposed and implemented systems must be perceived as an aid and not a danger to the organisation. It is imperative that all levels of the organisation must share this perception. Training and communication may influence maturity levels (*Supra.* Chapter 2, par. 2.3 and 2.4).

In the international examples it is not clear, or conclusive, that departmental maturity was a consideration when the decision to implement information management and technology was taken (*Supra*. Chapter 4, par. 4.2).

In the Department of Defence example and during the interview and discussions with the Director Enterprise Information Systems Architecture (2000), it was stated that initially maturity levels were not considered. It was, according to the interviewee, rather a case of departmental need. This, the interviewee stated, was especially true with regard to the transversal systems. The interviewee did acknowledge the fact that with the development of later systems and in the current scenario, departmental needs still enjoys prominence but that maturity levels are considered. The interviewee also stated that means of informing and training of staff influence the departmental needs. The previous Director Commodities and Services (2000) also stated that departmental needs rather than maturity levels were a consideration when the decision to implement information (management and) technology was undertaken. The interviewee also reaffirmed the statement that maturity was only considered at a later stage and that this was enhanced by training and communication. The Director Human Resources (1999) stated that only transactional need were considered and all other human resources aspects forgotten. The Director Department of Defence Logistics Support Formation (2000), was of the opinion that both needs and maturity were considered and that the communication of the intent to implement systems was beneficial not only to the growth in the maturity level of management but also to the transactional acceptance of implemented systems. It may therefore be stated that the Department of Defence did (although not initially) consider maturity of the organisation as a factor when the decision to implement information technology was made.

From the Independent Electoral Commission perspective maturity of the organisation was not an issue as the organisation was initiated with the concept of advanced information (management and) technology implementation. These systems were required to ensure a free and fair election (interviews with the Manager Voting Station Infrastructure and Electoral Logistics, 1999 and the Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000). The Director Procurement stated that although some sections within the Independent Electoral Commission (for example stores) did not have a system to capture and manage their assets and consumables, they were sensitised to the future changing scenario from the onset. This, according to the interviewee, improved the maturity growth and assisted in the change management, which is associated with such an activity. The Project Manager Electoral Logistics System (2000) also stated that during the implementation of the logistics management systems due consideration was given to the maturity within the logistics environment. Prior to implementation, this was perceived to be a level acceptable for the implementation of the system. It may therefore be concluded that maturity, as an element, was given due consideration by the Independent Electoral Commission at the time when the decision to implement an information management and technology solution was made.

From the Department of Justice perspective, the Deputy Director General Corporate Services (2001) stated that the required maturity level in the department was not yet achieved but that departmental need required the implementation of an information management and technology solution. In order to overcome the shortcomings in maturity at all levels the interviewee stated that communication and training initiatives had been launched. This had improved the maturity level with regard to the total system perspective within the organisation and assured a buy-in from all levels. The Director Information Technology

(2001) reaffirmed that the communication of the aim of the court's project improved the acceptance of the departmental perception with regard to its role within the justice cluster. The Project Manager Digital Nervous System (2001) stated that the perception was that of relatively high maturity levels with regard to acceptance for proposed implementation of systems. The Project Manager Financial Administration Systems (2001) stated that in the financial administration environment, the perception was of relative high maturity levels with regard to technology and system implementation. It may therefore be stated that although the Department of Justice may not have had an adequate maturity profile at the onset of the implementation of the information management and technology drive, this situation has improved. It may also be stated that maturity was given due consideration, but that departmental needs were of a higher priority.

5.3.3.4 Information technology

Information technology in this perspective implies the infrastructure availability to support an information management environment. Implied herein are the aspects of interconnectivity (local and wide area networks) and the existing status of the computer hardware. This is an imperative as old and out-dated hardware such as 286/486 computers will not be able to accommodate more recently released software (for example Microsoft Windows NT™ or 2000™), nor will they be able to accommodate networking, which is required for database facilitation (*Supra.* Chapter 2, par. 2.3 and 2.4).

From the Jordanian example it is clear that the existing information technology is state of the art. It is stated that they are the leaders in the Middle East as is stated by and in Ahmad, *et al*. (1998:119) and *Supra*. Chapter 4, par. 4.2.1:

> *Jordan grew in its public sector information technology from virtually no structure in 1970 to the leader in the Middle East.*

From the Mexican example it is also clear that thought did go into the establishment of state of the art technology infrastructure as is reflected on by and in Gutierrez, *et al.* (1999:23) and *Supra*. Chapter 4, par 4.2.2:

> *The growth in the application of computers as a solution provider and information source in Mexico is considered to be the second highest in the Latin Americas. In this regard only Brazil surpasses it. The main constraint, however, is the lack of communications infrastructures.*

The Chinese example is not very clear on the level of information management technology although it is stated that more and more hardware was procured by the Chinese State Enterprises in order to execute their functional (also known as the transactional) tasks. According to the research networks are insufficient or completely absent which leads to duplication of data and lack of data interchange. The following excerpt as reported on in *Supra*. Chapter 4, par. 4.2.3, supports this:

> *... no or very limited network capability exists for the interchange of data and more overly for management purposes.*

Furthermore massive duplication of data is evident due to the lack of an integrative system of data management and networking. It is also stated that managers spent more time on obtaining more hardware for functional or task driven actions than on managing the actual activity or Chinese State Enterprises, allocated to them. It is also clear that a lack of government investment and lack of efficient use curtails management optimisation of the Chinese State Enterprises (Dologite, *et al.*, 1998:119-121 and *Supra*. Chapter 4, par. 4.2.3).

The Californian example is relative clear in the fact that they opted for state of art technology in order to improve service delivery. This was

reflected on and supported by Caves, *et al*. (1999:4) and *Supra*. Chapter 4, par. 4.2.4:

> *The Californian solution was one of embracing the information technology age in order to establish smart communities.*

The Californian local governments opted for integrated network solutions so as to improve on efficiency and effectiveness. As stated in *Supra*. Chapter 4, par. 4.2.4 and supported by Caves, *et al*. (1999:3), the following holds true:

> *... strong proponents of an integrated system whereby data is exchanged in-order to optimise management.*

From the international examples it may therefore be stated that state of the art information technology and communication was considered an important factor in order to improve overall public service delivery.

The Department of Defence interviewees were all adamant that state of art technology was the key to success. The Director Enterprise Information Systems Architecture (2000) stated that, had the Department of Defence not kept abreast with information technology, management in the Department of Defence would have been virtually impossible. According to the interviewee, networks and communication technology are essential to support large and complex organisations. The interviewee also stated that the need for real-time information requires the application of modern front-end technology. The previous Director Commodities and Services (2000), was of the opinion that no defence force can operate without computers. This interviewee also elucidated on this point by stating that integrated systems in support of management are essential. The interviewee further stated that there was a need to remain at the forefront of technology in order to maintain an optimised organisation. The Director Human Resources (1999) stated that without the support of the technology base in the

Department of Defence, it would have been virtually impossible to manage the personnel of the department. The Director Department of Defence Logistics Support Formation (2000) stated that (technology) infrastructure deployment enabled the Department of Defence to not only implement integrated systems but also to optimise management. The interviewee also stated that the Department of Defence still has a need for maintaining the existing information technology and that best practise strategies should be followed in order to remain at the forefront of technology. It may therefore be stated that existing information technology in the Department of Defence is not only capable of supplying management information but also of supporting the department in transactional or functional tasks.

In the Independent Electoral commission example, the Manager Voting Station Infrastructure and Electoral Logistics (1999) response to the question on information technology, stated that the Independent Electoral Commission did not have any doubt regarding the rollout of state of the art technology to support the election process. According to the interviewee, the existing technology infrastructure was procured and implemented with the concept of a life cycle approach. The interviewee stated that due to the fast changing technology, the idea was to replace the existing infrastructure after the 2004 general election. In this way the Independent Electoral Commission will remain abreast of technology developments. The Programme Director Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium (2000) supported this point of view and stated that systems currently deployed in the Independent Electoral Commission are monitored and updated as part of the licensing agreements with the suppliers. The Project Manager Electoral Logistics System (2000) sited a specific example, in that the logistics system was upgraded after the national election to accommodate needs identified for the local election. The Director Procurement (1999) stated that information technology

deployment was key in the success of the transversal systems of procurement and financials in the Independent Electoral Commission. Deployed information technology supported the decentralised requirement statements of provincial offices and centralised head office procurement activities. The interviewee supported the notion of the life cycle approach for the phasing out of existing equipment and phasing in new equipment. It may therefore be stated that the Independent Electoral Commission maintains a policy of excellent information technology and communication infrastructure in order to support its electoral activities.

During interviews with the Department of Justice, the Deputy Director Corporate Services (2001) emphatically stated that the proposed integrated justice system would not be able to function optimally if there is no state of the art infrastructure. In support of this, the Project Manager Digital Nervous System (2001) stated that the aim of Digital Nervous System (DNS) is to supply the Department of Justice with an integrated technology support to enable the department to communicate internally. Cross-departmental communication through networks will also be facilitated. This will link the Department of Justice with other departments such as the South African Police Services and Department of Correctional Services. According to the interviewee, the rollout of equipment to the approximately 500 justice offices is currently underway and approximately 10500 computers will be deployed by the end of the 2001/2002 financial year. The Project Manager Digital Nervous System (2001) stated that the Department of Justice will be linked by means of local and wide area networks in order to facilitate, and realise, the true justice for all concept. The Director Information Technology (2001) stated that the aim of the department is to have an established state of the art computer infrastructure to support a state of the art justice system. The Project Manager Financial Administration Systems (2001) stated that the existing non-integrated systems

deployed in the Department of Justice require phasing out. The interviewee stated that the identified need for improving on the justice delivery, by implementing advanced information technology solution, was excellent. The interviewee was, however, concerned about the demographics of the country, specifically the rural communities, which not always supports such advance technology. It may therefore be conclusively stated that the Department of Justice applies the concept of advanced information technology and systems for the execution of their core function to wit bringing justice to all.

5.3.3.5 Communication

Communication is an important element when the decision to implement information management and technology is made in an organisation. In order to obtain not only user acceptance but also participation in the design of such systems, intent and objectives must be clearly communicated to all levels within the department (*Supra.* Chapter 2, par. 2.3 and 2.4).

From the international examples it can not be conclusively deduced that communication formed an integral part of their implementation strategy. The only reference to communication is in the Californian example, which concludes with the statement as reflected on in Kennard 1998, quoted by Caves, *et al.* (1999:11) and *Supra*. Chapter 4, par. 4.2.4, that the information age is:

> *"... profoundly changing the way we communicate...*

The previous Director Commodities and Services (2000) stated that initially the Department of Defence did not clearly communicate their intent to all levels in the organisation. The interviewee stated that it was only after the implementation of the initial transversal systems that senior management decided and authorised the communication of intent and objectives. The interviewee also cites the generality of these

types of systems as a problem in the communication and participation aspect. The previous Director Commodities and Services (2000) also stated that with the development of later systems, specific project offices were initiated which had as one of their tasks, the communication of intent and objectives. They also had to obtain inputs from the broader user groups during the design phases of such systems. Management information and process improvement was targeted. The Director Enterprise Information Systems Architecture (2000) stated that currently, clearly marketed intent and participation is of high importance in the design of all systems. The communication of objectives is done at as many forums as possible and staff is allowed to forward suggestions for the improvement of systems. The Director Department of Defence Logistics Support Formation (2000) stated that communication, especially to the user level, was initiated after it was realised that the change management aspect and resistance to change aspect were not considered with the implementation of the initial systems. This point of view was re-affirmed by the Director Human Resources (1999). The interviewee added that communication through marketing now forms an integral part of the system design and implementation strategy. It may therefore be stated that although the Department of Defence did not initially follow a communication strategy, the existing policy is one of communication to and at all levels of the organisation.

The Manager Voting Station Infrastructure and Electoral Logistics (2000) from the Independent Electoral Commission stated that it was policy from the onset of the decision to implement an information management and technology solution to keep all levels informed of the intent and objectives of the Independent Electoral Commission. Participation was limited as the core function of the Independent Electoral Commission greatly dictated the type of technology and systems to be implemented (Interview with the Programme Director

Klynveld, Peat, Marwick and Goerdeler (KPMG) Electoral Consortium, 2000). The Assistant Manager Electoral Logistics (2000) stated that communication was entrenched in the total change management program of the Independent Electoral Commission and it was this policy that made the acceptance of systems at all levels possible. According to him specific marketing drives especially aimed at the provincial and local levels made the application of the virtual satellite (V-Sat) feasible. The Project Manager Electoral Logistics System (2000) stated that in terms of the deployed logistics systems at warehouse level, prior marketing and training empowered the Independent Electoral Commission staff to facilitate the total election process. The Manager Voting Station Infrastructure and Electoral Logistics (2000) re-affirmed this by stating that all systems deployed were accepted as being beneficial to not only the transactional level but also to the management level. The Director Procurement (1999) was of the opinion that the somewhat aggressive marketing of the information management and technology solutions assisted the Independent Electoral Commission in, not only being operational in less than eight months, but also facilitating the election process to the degree that real-time information of results were available. It may therefore be stated that the Independent Electoral Commission did employ a principle of communication to and aimed at all levels to facilitate the implementation of the information management and technology solution.

According to the Deputy Director General Corporate Services (2001), the Department of Justice embarked on an informative display of the intent to computerise and to implement information management and technology as a solutions provider from the outset of the program. According to the interviewee the aim was to sensitise the staff of the Department of Justice and the public as whole of the intent of the department to make justice available to all citizens. Not only did they

make use of news articles but they also started with the publication of a newsletter explaining the objectives of the implementation drive. The Director Information Technology (2001) stated that for the purposes of the pilot project and the rollout of the digital nervous system, specific communication drives were initiated and implemented. This was not only to sensitise the general departmental users to the action but also to prepare them for the changing environment. The Project Manager Digital Nervous System (2001) stated that at this time there is an ongoing program to keep the Department of Justice's staff informed as to the progress of the implementation program and the objectives to be achieved. The Project Manager Financial Administration Systems (2001) stated that, within the environment of the State Attorneys, they have a program to sensitise and educate the staff and users of the system with regard to the new systems that will benefit all. The Deputy Director General (2001) also stated that the main aim of the communication was for management to buy in on the implementation and take ownership of the application. It may therefore be concluded that the Department of Justice, not only embarked on an information and communication drive, but are actively propagating the new justice systems at all levels.

5.4 Conclusion

In terms of the research for this thesis, it is clear that the identification of drivers, forces and denominators do play an active role in the decision to implement information management and technology in a department. It is also clear from the research for this thesis that in situations were the drivers, forces or denominators did not enjoy attention or prominence the implementation and application of the information management and technology was less successful.

It is also clear at this time that organisations primarily focus on transactional improvement in the management scenario. This situation is primarily due to the constant drive to improve transactional effectiveness. It is also clear from the empirical research that management is under the impression that executive management information resides as function in the management information available. This impression is primarily due to the fact that they (management) believe that data manipulation and data management equates to executive management information. Existing implemented systems are by no means inadequate with regard to information management and the amassed data are available for statistical inferences and therefore strategic decision-making. The application thereof is, however, absent.

The contribution of this Chapter to the overall research statement is found in the fact that it sets the basis against which the research findings are validated. This Chapter basically sets the stage against which the defined problem statement was tested.

Given the aforementioned, it is only logical to proceed to the analysis of the findings, which then forms the basis for the next chapter. This is required in order to validate the empirical findings against the theoretical and literature study and to determine whether the theoretical study supports the empirical findings.