

CHAPTER 6

INFORMATION MANAGEMENT, SYSTEMS AND TECHNOLOGY

6.1 INTRODUCTION

6.1.1 Information Management, Systems and Technology in the Public Service

This chapter seeks to describe the problems currently associated with Information Management (IM), Information Systems (IS) and Information Technology (IT) in the public service. It also seeks to go beyond these problems to identify options for transformation, which should contribute to overcoming such problems. In developing these options we have benefited both from the opinions of IT practitioners in the public service and private sector as well as from international precedents.

In this chapter, we believe that information is a fundamental resource of government, along with people, money and organisations. In the context of such an understanding, we therefore analyse **three** inter-related aspects of the information concept.

- Information Management (IM) concerns the management of information resources in government. As such it focuses on the use of information, the roles and responsibilities of those using the information resources and the controls, performance measures and business processes and objectives related to their use.
- Information Systems (IS) focuses on applications required to manage the information resources. It is therefore concerned with the development, operation, maintenance and upgrading of the systems used to achieve business objectives.
- Information Technology (IT) focuses on the technology required to support the applications or systems. It therefore focuses on the technological choices and standards required to make these choices to support the particular systems involved in the overall information management strategy.

Since the use of the information resource encompasses all three aspects of management, systems and technology, we will endeavour to refer to these different aspects when discussing specific issues. However when referring to all three aspects at once, we will use the term Information Management, Systems and Technology (IMST) on the assumption that it subsumes the others.

Although the primary focus of this chapter is the use of systems and technology to manage information in the public service, it is believed that such practices can only be understood in the context of developments in information management, systems and technology more generally. It is argued that the state may have a major role to play in promoting the "information society" and consequent use of IT in South African society as a whole, but it is recognised that current public service practice lags behind that of the private sector in South Africa who are themselves slipping behind developments elsewhere in the world. As a result the public service in South Africa is falling dangerously behind its public and private sector counterparts internationally.

In proposing options for transformation therefore, we have sought to identify best practice internationally. Although the private sector has played a leading role in the development and use of IMST, there are some valuable precedents such as in Australia, Canada, Singapore, Malaysia and the United States where other governments have taken the initiative. These, and other examples, suggest that the current shortcomings in the use of information management systems and technology in the South African public service may be overcome if sufficient political will is mobilised to address the systemic problems identified below.

It should also be noted that the view of IMST advanced here by the Commission is that of seeing the technology as being driven primarily by the business objectives of the state, and not the other way around. Even though we argue that information technology can significantly change the manner in which the public service conducts its business, and indeed should be used to radically re-engineer its processes, we believe that this transformation must be shaped by the strategic and operational requirements of the public service, particularly in relation to the provision of efficient, effective and equitable service delivery.

Indeed, we strongly support the position that all important decisions regarding IMST should come from the senior political and managerial leadership of the state and not be delegated to the technologists. The management of information, and the systems and technological choices arising from this, should be seen as equally important by senior political and management as are the management of people, money and organisations in the public service.

6.1.2 The Nature of the Problem

The essential nature of the problem is that current systems and technology applications in the public service cannot, in their current form, come close to meeting requirements of the new South Africa. The problem consists of two realities:

- The huge financial resources that the country has already invested in technology and systems;
- The dire need for the public service to leverage this investment in its quest for transformation.

This massive investment has been made in a highly fragmented manner and economies of scale are not being realised. The hearings conducted by the Commission have highlighted the fact that a huge cost has been borne by the South African public without any appreciable benefit in the form of greater service delivery or a more efficient and effective public service. Perceptions gathered from state officials also indicate that the current IT assets are not regarded as contributing significantly to service delivery or transformation objectives. In most cases, both the public and officials believe that current systems and technology may even act as a major constraint on realising these objectives.

In an area of human endeavour that demands that individuals acquire knowledge and skills as an on-going process, the public service has not benefited appreciably from the billions spent, nor does it have any significant pool of skilled IM resources. This problem area is possibly the most critical and demands to be resolved before any real progress at transformation can be made.

6.1.3 The Different Uses of IMST in Government

Technology and systems have been used for transaction and control purposes for many years, and in the past couple of years, new management information systems are being operationalised to supply strategic planning and policy decision-making. Very recently, the use of IMST is being tested to enable the electronic delivery of certain public services through kiosks and other mechanisms.

At present information regarding transaction and control data is managed in the South African public service using electronic means. In many cases -- such as the transversal financial and personnel management systems (FMS and PERSAL), the case management systems used by the Police, the motor vehicle registration systems used by Transport, the pensions and unemployment insurance systems used respectively by Welfare and Labour, and the subsidy management system used by housing -- the use of IMST is now essential. In these circumstances, what matters is whether these systems work properly. It is not a question of whether or not to have IMST, but whether we have good or bad IMST.

In recent years the use of IMST has extended to developing management information systems to assist senior management in their strategic management and policy roles. Although many of these systems build on the base transaction and control data systems mentioned above, they have been coupled with more general policy-oriented databases. The Commission has learnt of several separate initiatives in Housing, Welfare, Education, Health, and Constitutional Development. While the use of IMST in these instances cannot be questioned, the duplication of

data-collection and warehousing activities should be assessed with the intention of rationalising these systems in government.

Finally, it should be noted that IMST is being used increasingly to deliver services directly to the public. Indeed in the international arena this is currently one of the most exciting developments in the IMST field. The range on services that can be delivered directly using IT include information and transaction kiosks which enable citizens to access their government institutions 24 hours a day. The also include advances in IT-enabled medicine and education where international expertise can be delivered to remote areas via Internet technology or equivalents. Although South Africa has yet to advance very far along these avenues, it is likely that IMST enabled delivery will become an option in the near future.

6.1.4 Pros and Cons of IMST in Government

All these different uses of IMST in government raise the inevitable question in the South African context of whether a country already over-burdened with large-scale unemployment, lows levels of scientific and technological education and a vast rural population currently outside of the reach of electronic communication should invest further in such advanced technology. There is a legitimate concern that further advances in the information society will merely exacerbate the existing divisions between rich and poor, urban and rural, and the technologically informed versus the technologically marginalised.

There are no easy answers to such a question since there is little to suggest that, without conscious interventions, such technologically marginalised groups will ever succeed in gaining gain access to the information society. There is reason to believe, however, that current information technologies and systems have greater potential than earlier ones to access the poor, rural and technologically marginalised sectors of society. However the extension of the information society to these groupings will only happen if there is an explicit commitment from government to ensure that they are included.

The extension of the information society in South Africa is therefore both feasible and desirable if it can be used to assist all segments of society to make use of the new information tools and systems. There are also compelling arguments to suggest that South Africa cannot afford not to continue to invest in appropriate information technology. These reasons range from the fact raised above that many of the basic operations of government are now entirely dependent on such technology, to the argument that the country's economic future relative to the rest of the world will also be determined by the extent to which it seeks to keep abreast of technological developments elsewhere.

6.1.5 Summary of Main Findings

6.1.5.1 Executive Awareness

From the Commission's hearings, investigations and studies into this area, we are convinced that there is quite a high level of awareness and understanding among senior managers in the public service about the need for and uses of IMST, about the problems and challenges in devising and implementing effective IMST strategies, and about possible solutions. However, the difficulties of taking over and transforming the current public service, and the overwhelming responsibilities of addressing pressing problems of delivery, have meant that they have either:

- Decided to live with the existing state of affairs, however constraining; or
- Embarked upon short-sighted IMST initiatives designed to address their immediate difficulties with little or no attempt to seek systemic solutions to problems operating across different line departments and spheres of government.

While it is not expected that government executive ranks should become experts in technology, it is imperative that they should have an adequate understanding and appreciation of the main issues, challenges and opportunities involved. In particular, there should be enough understanding of IMST to enable senior management not only to deal with current problems but also to position their organisations to meet future objectives in new and different ways. It is therefore imperative that targeted executive level IMST training should be introduced as a matter of urgency.

6.1.5.2 The Basic Building Blocks

The Commission believes that immediate steps should be taken to put in place certain basic building blocks to ensure that most future IMST developments in the public service share a common set of features that will contribute to their ultimate improvement in the longer-term. We believe that these building blocks will include an **object orientated open systems architecture** primarily based upon commercially available IT systems. The building blocks thus must at least include the definition of the following technical components:

- Networking protocols
- Operating Systems
- Data and database standards
- Middle-ware
- Transaction Processing
- Desktop environment
- Basic documentation standards
- Use of the Internet medium

The definition of these technical standards would enable any system to share data and inter-operate with any other even if the original program specifications did not mandate such sharing. Such standards are not designed to limit departmental and provincial autonomy, but to facilitate system choices that are compatible. They would also enable the public service to more readily extend the capabilities of the current systems and obviate the need to replace them in the short term. The move towards this kind of systems architecture, we believe, would help:

- To ensure greater inter-operability and integration of different applications;
- To facilitate continuous improvement in the technology and human resources in the state; and
- To overcome current skills shortages and service bottlenecks.

6.1.5.3 Short Term Procurement Moratorium

In order to spur the adoption of these basic building blocks, the Commission proposes an immediate short-term procurement moratorium on all large IT systems while a basic framework is agreed. Although the full extent of current large system procurement is unknown, it is estimated that more than R2 billion worth of IT is currently in the process of being acquired. Since many of these systems are likely to be operational in the state for the next 10 to 20 years, and since it is understood that a number of these large systems are not based on the above building blocks, the Commission believes that the interests of the country would be served by such a moratorium, while agreement is reached on the basic features of all new systems.

A two to three month delay in procurement is unlikely to have a significant impact on short-term delivery, but it will ensure the longer-term viability and improvement of IMST within the public service. Once the basic framework has been agreed, departments procuring new systems will only need to certify that their systems incorporate the basic building blocks prior to proceeding with the procurement process. In order to ensure that no mission critical IMST expenditure is delayed, public service agencies will be able to seek emergency approval for urgent expenditure from a Moratorium Committee which the Commission recommends should be set up to oversee the process.

Although the procurement moratorium may be seen by overburdened bureaucrats as an additional obstacle to addressing short-term transformation and service delivery needs, we believe that it will not be difficult to achieve agreement on the basic building blocks since they incorporate all the characteristics of current best practice accepted by both the public and private sector unlike. The moratorium will therefore provide the political will to focus the attention of different public service role-players on achieving a rapid agreement on commonly shared IMST principles.

6.1.5.4 Business Process Re-engineering

In the medium term, the Commission advocates the adoption of business process re-engineering techniques to ensure that there is a correspondence between the business objectives of different functional government agencies and the IMST used to meet these objectives. Although we accept that political and business objectives should drive the re-engineering of processes in government, we believe that the form of information systems and technology becoming available is likely to make a significant contribution to the restructuring of public service activities as they are currently being performed. Already the concept of business process is being used in the inter-ministerially driven **National Crime Prevention Strategy**, and we believe that this model could be applied to rationalise other line function activities across government.

6.1.5.5 Alternative Service Delivery

Information is pivotal to the performance and capacity of government services and the nation's economic competitiveness. At issue is whether we can use information technology effectively to empower government, the private sector, and citizens alike. The complexity of today's world demands that the public and private sectors not only learn to master this tool, but also to work cooperatively to maximize the national benefits. To achieve this, the public and private sectors must engage in innovative partnerships that share the costs, risks and rewards of developing technology-based solutions. To this end, the Commission refers to the pioneering work on **Alternative Service Delivery (ASD)** as a model for developing new public-private partnerships for IMST delivery (see Section 6.8.3 for a fuller discussion of ASD).

6.2 VISION AND STRATEGY FOR IMST

6.2.1 Context

It is clear to the Commission that the Government lacks an overall vision and strategy for IMST and that, in the absence of such a strategy, individual departments are finding it difficult to define their own IMST strategies. Most departments are therefore pursuing their policy agendas independently, with IT systems being developed and/or operated to meet only the specific departmental policy objectives. In the absence of effective policy coordination, IMST strategy is likely to remain incoherent. The cost implications of this situation are enormous.

The absence of an IMST strategy is itself a consequence of the fact that IMST is not generally understood in terms of the Government's overall vision or mission. Although there seems to be considerable attention given to IMST questions and a significant investment in IT systems, IT is seen at best as an instrument of achieving other government objectives. At worst, current IT systems are seen as an obstacle to improving overall performance in the public service.

6.2.2 Towards a Strategy for IMST

Recently a number of initiatives have pointed to the need for a coherent and coordinated strategy for IMST in government, and made a number of practical proposals in this regard. These include:

1. The DPSA's objectives for the Government Information Project (GIP);
2. The DPSA sponsored workshop on IT Business Architecture for the Public Service, held in November 1997;
3. The position paper delivered by South African public and private sector IMST experts at the Information Society and Development (ISAD) international conference in 1996;
4. The Department of Communication's (DoC) work in promoting a National and Government Information and Communication Technology Strategy (Info-Com 2025).

6.2.2.1 DPSA's Vision

The DPSA has identified a Vision for IMST use in government. There is, however, no indication of what support the vision currently has across the public service. The vision is stated as follows:

"IT will be aligned with Government Business Goals and will be a change agent to create a responsive, result oriented, value added Public Service."

6.2.2.2 The GIP Project

The objectives identified by the DPSA for the GIP project perhaps best summarise the key focus areas of any IMST strategy. They include the following:

- To promote the concept of information as a strategic resource to be managed as any other resource;
- To facilitate the creation of a culture of sharing and re-using information;
- To promote the principle of aligning information and IT strategies with business strategies, objectives, and processes;
- To promote the concept of re-engineering of processes to ensure that they all add value to the service being provided;
- To identify and coordinate transverse information sources and needs;
- To investigate and establish norms, standards, principles and mechanisms to enable information sharing;
- To build capacity in government to better manage information.

6.2.2.3 IT Business Architecture

The DPSA has developed these ideas further through a workshop to define a business architecture for IT in the public service for the next one to five years. The workshop, which involved about 100 public servants involved in IMST, came up with objectives similar to the above. In particular it sought to stress that IT "is not a support function to the public service, but that it is central to service delivery. The workshop also developed a series of recommendations concerning transformation, leadership and organisation, human resources, IT processes and architecture and procurement which complement those provided in this chapter.

6.2.2.4 ISAD Policy Paper

Apart from the DPSA vision, the most clearly stated position of government has been the **position paper** delivered to the Information Society and Development (ISAD) International Conference in 1996. Although the main focus of the paper was to develop and promote the greater use of IMST in South Africa at large, it also proposed a number of pilot projects which would involve the public service directly. These pilot projects included:

- Multi-purpose community centres (MPCCs) to ensure that those traditionally marginalised from IMST would get access to the benefits of an information society,
- The development of centres of excellence and resources (CEERs) to ensure that South Africa makes a contribution as a producer and not just a consumer of IT products,
- The development of IT related education and training standards within the ambit of the National Qualification Framework,
- A proposal to broaden access to public service information through an on-line Internet enabled system;
- The promotion of an IT enabled Contemporary Music and Arts archive.

Although these projects are not in themselves a strategy, they include elements of such an overall IMST strategy. The paper proposes in particular that a task team be established of all relevant stakeholders to contribute to a report on the "Vision, Principles and Strategy for the South African Information Society." It also proposes that the process of formulating Green and White Papers on the Information Society should be undertaken. As far as the Commission can establish, these proposals have not yet been formally endorsed, although a number of Departments (Communication, Public Service and Administration) are tackling aspects of them.

6.2.2.5 INFO.COM 2025

In an unrelated but parallel initiative, the Department of Communications (DoC) won cabinet support to promote the National and Government Information and Communication Technology Strategy. The DoC proposals focus on both information and communications technology (ICT) in both the private and public services. Part of the value of the DoC proposals is that they stress the inter-connectedness of public and private sector ICT activities. On the one hand, they expressly advocate that the current use of government ICT resources be leveraged to "support national

strategies for economic growth and access to government services for the majority of South Africans." On the other hand, and to achieve their integrating objectives, the department advocates the use of network systems to "bridge the gap between information technology and communications."

Although most IT professionals in the public service would give qualified support to these initiatives, there is less agreement on the specific form that a future IMST strategy should take. Some favour the production of a government Green or White Paper. Others argue that such documents are likely to be outdated very quickly. They therefore favour a series of projects to be launched to achieve different strategy outcomes. The Commission is concerned that the latter process will not develop a cohesive IMST strategy for the Government or nation. It does however believe that the project method could contribute to such a policy formulation exercise if a suitable institutional process is provided to bring these different policy projects together.

6.2.3 Problems

Notwithstanding the worthy efforts of the above mentioned departments to develop and promote an IMST strategy for the nation and for the public service, the problem at present seems to be a lack of commitment by other actors to buy into this vision. The absence of an overall IMST strategy and implementation plan for the public service at present, has led to the following problems:

- The widespread use of incompatible platforms, networks and applications;
- Information is not shared or re-used in any organised manner;
- An unsustainable broad set of technology skills needed to maintain the systems;
- Unacceptably varied and non-standard priorities and approaches to the use of IMST
- Unnecessary duplication of functions and systems between line departments and provinces.

These problems have been exacerbated by the pace of technological change, which has speeded up considerably since the introduction of the Internet. Internet technologies have accelerated the rate of innovation and the supply of technology products in the marketplace. This has added an additional important variable in the complex problem-set outlined above by introducing the problem of excessive technological choice. In the proposals discussed further in this chapter, we advocate that policy is required to limit the number of choices to a workable set of universally accepted standards.

6.2.4 Precedents

Given the critical importance of an overall strategy for information management, systems and technology in government, it is ironic that there are few international precedents that can be drawn upon. This is in part due to the relative immaturity of government interventions in this area, and partially due to the fact that in the past decade or so, governments have moved away from grand plans and total solutions. Nevertheless there are a number of precedents that can help to inform developments in South Africa, and in particular the cases of Australia and Malaysia which were studied in some detail by the Commission.

6.2.4.1 The Australian Strategy

In many ways, the Australian strategy provides the most comprehensive example. Their approach to policy formulation has seen a progressive development of an overall IMST framework over a period of three years. Central to their approach is the establishment of a number of institutions and officers to ensure that the policy process is coordinated and ultimately integrated into a government-wide Information Management Strategy. The 1995 document *Clients First: The Challenge for Government Information Technology* proposed an Office of Government Information Technology (OGIT), a Chief Government Information Officer (CGIO) and the creation of a Government Information Services Policy Board (GISPB) all tasked to contribute to the development of an overall IMST strategy. Their 1996 framework, soon to be published as a Blueprint, outlined a number of key strategic objectives for such a policy. These included:

- The need for government services to focus on clients and to deliver services in a manner which suits the client;

- The use of a "single window" concept of government services available at common locations;
- The clustering of IT, communications and corporate services;
- The greater standardisation of common administrative systems by agencies;
- The reduction of the number of government data centres and the encouragement of agencies to seek these services from the most cost-effective supplier in government or in industry;
- The promotion of technology for service delivery using IT;
- The promotion of common solutions across agencies;
- The use of a lead agency concept where one agency is supported to develop solutions with wider applicability across government;
- The agreement of government-wide IT standards.

The Commission believes that many of these strategy components could usefully be incorporated into an overall IMST strategy for South Africa.

6.2.4.2 The Malaysian Strategy

While the Australian strategy provides most of the component parts for an immediate strategy, the Malaysian strategy for Electronic Government should also be applauded for its far-sightedness. The strategy defines electronic government as follows:

A multi-media networked paper-less administration linking [central] government agencies with government centres around the country to facilitate a collaborative government environment and efficient service to businesses and citizens.

The objectives of the strategy include:

- Offering efficient, high-quality administrative on-line services to citizens and business;
- Streamlining government's internal processes to improve quality, reduce costs and increase productivity;
- Strengthening data security and protecting privacy;
- Increasing citizen participation in government;
- Creating transparency through good documentation, effective communication and traceability.

Although similar to the Australian strategy, these Malaysian objectives advocate a much more fundamental transformation of government arising from the application of the new information technologies. The Commission believes that when an overall IMST strategy is formulated for South Africa much could also be learned and incorporated from the Malaysian experience.

6.2.5 Options and Recommendations for an IMST Strategy

In line with the project based approach to policy development, it is proposed that current initiatives described above be supported in an attempt to develop an integrated strategy for IMST in government. The DoC projects described above and the DPSA IT Business Architecture and GIP project will contribute to the formulation of an overall government IMST strategy. What is required however is an institutional strategy to ensure that these separate initiatives are ultimately integrated. The key elements of such a strategy are discussed below.

6.2.5.1 Features of an IMST Strategy

- **Application Integration and Inter-Operability.** In suggesting options and making recommendations with respect to the future direction of the Government's IMST strategy, the Commission supports approaches which are likely to promote the **integration** and/or **inter-operability** of new and existing systems. Although the concept of an integrated national database has been around for a while, complete integration is not yet technically or politically feasible. There has therefore been increasing emphasis placed on systems that are inter-operable rather than fully integrated. In this context, inter-operability refers

- to the capacity of different systems to access information from other systems even though the systems may not be integrated (that is, they would use different hardware and software but the software could communicate).
- **The Internet and the World Wide Web.** The manner in which inter-operability is being promoted on the Internet is in the development of industry (and ultimately worldwide) software protocols which enable software to interact with each other. As access and security standards are settled and implemented, this Internet medium becomes a potential doorway to systems for integration and inter-operability. It is proposed that current and future public service IMST use Internet technologies to facilitate inter-operability, and with the appropriate security systems, greater access both within and outside of the state.
 - **Common Operating Protocols.** It is likely that in the promotion of inter-operability, more attention should be focused on the formulation of common protocols rather than seeking to standardise information systems across government. The formulation of common protocols may in any case occur without explicit government action as a result of international moves for greater inter-operability.
 - **Common Data Models and Data Objects.** The identification system discussed below will form the basis of one set of information standards, which would considerably ease the flow of information concerning personal and corporate identities. Similar object-oriented models may be developed to facilitate further integration and inter-operability. Ultimately the promotion of integration and inter-operability will need more than common data models for information used by public service agencies, but these common data objects will create the basis for developing an inter-operable system. Indeed without such common data objects, integration and inter-operability will remain an impossibility.

6.2.5.2 Developing Strategy

The approach adopted by the Commission on the issue of strategy is that we understand this to be a process which should within a year yield a generally accepted vision, mission and set of objectives for IMST in the public service. In developing such a vision, mission and strategic objectives, the distinction between information management (IM), information systems (IS) and information technology (IT) should be heeded.

- **Information Management Strategy.** As noted in the introduction, IM refers to the roles and responsibilities associated with managing information in government. An information management strategy is concerned with management controls, management responsibilities, performance management and process management. It is likely that there will be only **one** such strategy for government and that it will evolve over the next two years as greater clarity is achieved with respect to IS and IT strategies. The Australian Framework mentioned above suggests that such a IM strategy should incorporate some or all of the following issues:
 - The relationships between business processes, clients and corporate information;
 - The costs and benefits of the use of information management;
 - The role of IT in supporting IM needs;
 - The promotion of collaboration and shared use of information (regarding Groupware, data-warehousing, directories, standards, etc.);
 - The integration of approaches to data administration;
 - The role of records in support of business needs.
- **Information Systems Strategy.** IS strategies are concerned with the application of IT to achieve the business objectives of different agencies within the public service. Since business objectives are likely to differ across agencies, there will undoubtedly be a range of IS strategies aligned to the objectives of different business units within the public service. Although IS strategies evolve incrementally as users define their IT needs, it would be irresponsible for new IS strategies to be developed before sufficient agreement is reached on an IT strategy.

- **Information Technology Strategy.** The IT strategy is concerned with the questions of technology policy and is likely to focus primarily on establishing standards for appropriate use of IT in the public service. There should therefore only be **one** IT strategy for the public service. We have already indicated some of the issues that should be covered by such a strategy. Drawing on the Australian framework, we can define the set of standards which we believe should be covered by any IT strategy in government. This set would include the following:
 - Electronic publishing standards;
 - Document and database description standards;
 - Records management and archive standards;
 - Document access, delivery and reading standards;
 - Electronic messaging and transaction standards;
 - Audio-visual/multimedia/graphics standards;
 - Tele-communications standards;
 - Spatial data standards;
 - Client data standards;
 - Security standards;
 - Privacy standards;
 - Equipment and facilities.

Although we believe that it is essential that an IT strategy is established as soon as possible for government, since it will help to facilitate both the IS and IM strategies, we recognise that it is unlikely and possibly un-advisable that appropriate standards for all the above items can be developed at the same time. We therefore envisage an incremental process whereby basic standards are established first and a more comprehensive set of standards is formulated later. We would expect these standards to be reviewed on an on-going basis by the organisation of the Chief Information Officer (CIO) which the Commission believes should be established as a matter of urgency (for more detail on this proposed organisation, see Section 6.3.3.1).

6.2.5.3 The Basic Standards

The Commission therefore proposes that a basic set of standards should be defined that would begin the process of rationalizing technology choices.

The guiding principles in defining technology standards should be:

- To maximise application inter-operation and integration;
- To leverage economies of scale;
- To rationalise the skill sets needed to provide operational effectiveness;
- To facilitate the migration of the current computing environment;
- To obtain Value for Money.

The basic standards would include the following:

- **Network Protocols** - to promote inter-operability. All applications on all networks should communicate using the same network protocols. The TCP/IP network protocol is becoming the *de facto* standard and the private sector has begun the implementation of the protocol as a standard.
- **Desktop Environment** - this is in essence the "coalface" of the Government's information management infrastructure. The imperative of formal standards for the user environment is driven by the need to leverage the vast economies of scale that are possible in this area. Standards would include the users' hardware platforms, operating systems, personal productivity applications and user interfaces such as Windows and Internet browsers

- **Operating Systems** - this basic component of any computing resource determines the environment that the machine can integrate into and inter-operate with. It determines the type and nature of the applications that are possible on that resource. It also determines the nature of the skills that are necessary to keep the environment operational.
- **Databases/Data Warehouses** - the choice of the technology to store and manage data is critical to the ability to move, share and replicate information between and amongst different systems and users.
- **Transaction Processing** - the ability to handle high volumes of business transactions is a necessary ingredient of large scale, enterprise-class systems. These systems must offer high levels of data integrity and transaction security in an environment that will need to be operational 24 hours a day and 365 days a year.
- **Security Standards** - the need to provide authenticated access to applications and data to many different sets of users in a secure, safe manner is critically important. The standards should not only provide guidance on the technology choices but should determine the organisational policies and procedures that implement information security.
- **Middle-ware** - this is the 'glue' that gives disparate systems the ability to communicate. Technology standards for middle-ware are necessary to provide the inter-operability of existing applications with the envisaged new systems. In brief, effective standards in this area are the critical component of any systems migration implementation
- **Data models** - without agreement on key data models, data entered in one system will need to be re-keyed into another system, thus negating any electronic inter-operability create by the other standards described above. Amongst the first data objects to be agreed upon will be the unique identifier and data required by the base register (discussed in section 6.6.3 below). Other key data objects can be identified on the basis of what information public service agencies plan to share.
- **Document/Multimedia standards** - although not as urgent as the other standards mentioned above, having common document and/or multimedia presentation standards ensures that information captured in one format is immediately accessible by those wanting to access it. The possibility of converting documents into HTML or other Internet friendly format needs to be explored.

It is unlikely that all these standards could be agreed in the two-three months period of the moratorium proposed above, but it is believed that at a very minimum, the networking standards, transaction processing standards, the unique identifier data model and HTML document standard could form the initial set of standards. Once the base set of standards have been agreed, the inter-ministerial proposed in Section 6.2.2.4 above could set a programme for defining an extended set of standards adequate to constitute an appropriate IT strategy for the public service.

6.2.5.4 IMST Vision

In order that the above IM, IS and IT strategies and standards are formulated within a coherent whole, the Commission proposes as a first step that government as a whole adopt an IMST vision. We believe that such a vision will only be adopted if it is agreed by those who will be working within its parameters. It is recommended that the Chief Information Officer (proposed above) as a matter of priority sets in place a process whereby the main government agencies can play a part in formulating the overall government vision.

6.3 THE MACRO-INSTITUTIONAL CONTEXT

6.3.1 Context

It was evident from the Commission's investigations that there currently exists a plethora of conflicting and overlapping public service institutions responsible for some or other aspect of IMST in South Africa. Not one of these agencies seems capable of taking responsibility for the overall strategy that should govern the use and development of IMST in the public service and in society at large.

Given the current move towards the decentralisation of government within nationally defined norms and standards, the Commission believes that what is ultimately required is an institutional mechanism that can ensure the coordination of an overall framework for IMST, while at the same

maintaining departmental and provincial autonomy. The Commission advocates organisational autonomy within the boundaries of a common enabling framework of governance. This organisational autonomy is central to ensuring that senior managers, and especially IM managers, take responsibility for the systems under their control. However unless a common policy is established and maintained, the existing incompatibility of IMST in the public service will be exacerbated.

An additional issue is concerned with the institutional implications arising from the adoption of IMST. The application of IMST in the public service has not given rise to the same degree of organisational and operational transformation that has occurred in the private sector. There is little or no evidence from the presentations made to the Commission that IMST is seen as a means of transforming the way in which the public service undertakes its business.

6.3.2 Problems

6.3.2.1 Lack of Clear Roles and Responsibilities

Currently at least seven public service agencies have a role to play in IMST issues. These include:

- The Department of Public Service and Administration (DPSA) which has responsibility for developing IMST policies for the public service as a whole;
- The Public Service Commission (PSC) which has the responsibility of monitoring those policies;
- The Department of State Expenditure (DoSE) which has the responsibility of supervising the main transversal systems and managing the Central Computer Services (CCS);
- The Department of Trade and Industry (DTI) which has a responsibility for promoting the IT industry;
- The Department of Communications (DoC) which has been given the responsibility to act as secretariat for the development of an IMST strategy for the country with the ultimate responsibility for such a strategy being vested in the Deputy-President's Office (ODP);
- The Department of Arts, Culture, Science and Technology (DACST) which has been charged with developing the technology foresight study of IMST in South Africa.

Given such a large number of agencies with IMST responsibilities, it is not surprising that there has been considerable confusion over roles and responsibilities.

6.3.2.2 Lack of Coordination

Although it is recognised by most government departments and agencies that central coordination is necessary to bring together a national IMST strategy for government, there is also not much clarity on the character and location of such coordination. In the absence of any agreed co-ordinating agency at present, the DPSA has formed an informal IT Executive Committee (ITEXCO) which seeks to coordinate the IMST actions of the public service. Despite the fact that public service agencies should be represented on the ITEXCO by their business head (normally the DG), current participation on the ITEXCO is mainly by those with IMST operational responsibilities. Many participants feel that it operates primarily therefore as a forum of IMST professionals rather than as a body which can ultimately steer IMST policies in the public service.

6.3.2.3 Proliferation of Systems

There is concern in some quarters that this lack of central coordination is encouraging a proliferation of systems acquired by different departments and provinces, which is leading in turn to even greater incompatibility and a waste of resources as public service agencies acquire unique systems tailored to their specific needs (a trend it has been argued that has also been encouraged by the suspension of the IT prescriptions in Chapter E of the PSSC, pending the production of new IMST guidelines). On the other, officials from the DPSA argue that too prescriptive a specification of IMST resources, as they believed occurred with Chapter E, leads to a situation where Departments and Provinces stop taking responsibility for their IT systems. In both these cases, the officials concerned believe in a minimum level of IMST coordination, but they differ in terms of its extent.

6.3.2.4 Application Usability and User Perceptions

User departments, especially in the provinces, have reported having considerable difficulty in using the transversal legacy systems operated by the DoSE (such as PERSAL, BAS and FMS), and in some cases they have chosen not to use them. Given the many problems with the transversal systems, future IMST strategy will need to consider when to adopt new systems technology. If, as State Expenditure seems to suggest, the new systems are standard commercially available packages rather than the current propriety systems, then issues such as integration and inter-operability should be more easily addressed.

6.3.2.5 Problems in Institutional Re-engineering

There is currently limited understanding in government of how IMST can be used to restructure its functions. The structures, functions and organisation of government seem to be largely determined by historical and political precedents rather than business operations. While it is unlikely that political imperatives will diminish, it is possible that, as the imperative to deliver becomes more critical, government may begin to have to adopt a more business-like approach to restructuring. This would effect both the internal restructuring of current individual departments, as well as the more ambitious attempt (recommended by the Commission) to restructure the service as a whole. It can be anticipated, however, that unless additional public service functions are created in the process, such an IT enabled re-engineering process is likely to reinforce the current pressures to downsize, with obvious and controversial implications in terms of job losses, union resistance and the like.

6.3.3 Precedents

The Commission examined and drew useful insights from a number of different cases, including New Zealand, Singapore, Malaysia, Malta, Canada, Australia and the United Kingdom. It found the Canadian and Australian concept of a Chief Information Officer (CIO) valuable because it ensures high-level coordination of IMST functions within a clear framework of whole-of-government objectives set by the office of the CIO. The Commission believes that the New Zealand functional model of coordination could be particularly useful because it recognises that IMST policies spans a series of public and private sector concerns. The Commission was also impressed with the Australian lead agency concept, which is based on the premise that, with the advent of new technologies and the devolution of operational authority, it is possible for information management functions to be decentralised.

6.3.3.1 The Chief Information Officer (CIO)

The CIO function was established by the Canadian Government in 1993 to provide government-wide leadership in the following areas:

- Selecting and managing, in consultation with the user community, common IMST systems;
- Identifying and implementing opportunities for departments in the same geographic location to share administrative services;
- Directing and implementing the re-engineering of business process in the public service;
- Establishing business context, strategic direction and standards for IMST development;
- Ensuring that IMST services support the Government's overall objectives.

6.3.3.2 The Lead Agency Approach

The lead agency concept in Australia is based on the following principles:

- Acceptance at agency head level that the role involves a whole-of-government responsibility and must be resourced appropriately;
- Acting as a network entry point manager for information relating to the particular functions undertaken;
- Monitoring the environment to maintain the service at world class standards;
- Co-ordinating for the whole of the public service the development of legislation, standards and/or guidelines concerning that function;
- Providing relevant assistance to other agencies; and
- Coordinating with other public service organisations as necessary.

6.3.3.3 The Three Spheres of Government IMST Policy

Although most countries reviewed have created a system or agency for IMST coordination in the state and society, the model from New Zealand seems to incorporate features which will best suit South African circumstances. The New Zealand model has three different bodies, which advise on IMST:

- An Inter-departmental Committee convened by the equivalent of the PSC comprising the six departments concerned with government use and procurement of IMST;
- An IMST policy unit housed in the equivalent of DTI which is concerned with IMST issues arising from government's role as a social/economic policy maker; and,
- An IT Advisory Group made up of ten leading private sector managers who advise the Government on the use of IT from a supplier and user perspective.

6.3.4 Options and Recommendations

6.3.4.1 Coordination of IMST Policy

The Commission favours a decentralised model of coordination, based on a combination of the New Zealand functional approach and the Australian lead agency concept. This is because such a model takes into consideration the fact that there are a number of different spheres of IMST-related policy. Firstly there is the Government user's perspective, then there is the perspective of those promoting industrial development, and finally there is the perspective of industry as a whole. The advantage of such a model is that it recognises that it is unlikely that one centre can coordinate all IMST related policy, and what is required instead is an inter-locking set of institutions which can draw upon each others' perspectives to formulate appropriate policy or advice to address their differing concerns.

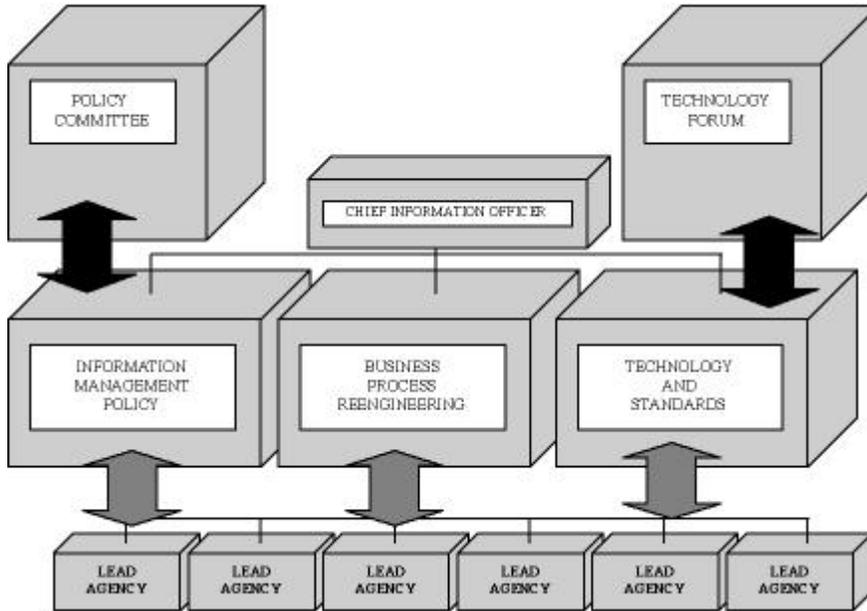
This model is also not too different from the functional specialisation that already exists in the South African situation. While the DPSA has been given the responsibility for formulating IMST policy for government, the DoC and the DACST has a responsibility for wider IMST policy, and DTI has responsibility for IT industrial strategy. Although there is no logical problem with this functional differentiation, it is likely to perpetuate divergent policies in the absence of some overall coordination. There remains a need for a coordinating-agency mechanism, which will have the authority to align the diverse perspectives of these different functional perspectives with the needs and objectives of government.

6.3.4.2 Chief Information Officer

As a major step towards improving coordination, the Commission **recommends** that a Chief Information Officer be appointed to provide clear, strong leadership, to integrate information technology into government business processes, to make government a customer-driven enterprise, to define a vision and oversee implementation, to encourage and facilitate cooperation; and to serve as a catalyst for change. The Office of the Chief Information Officer will be expected in particular:

- To develop a strategic vision for using information resources;
- To develop strategies to improve information-resources management, leadership and authority across and within public service agencies in all spheres of government;
- To set priorities for public service information resources management activities;
- To develop implementation plans for, and monitor progress on information technology initiatives;
- To work with provincial and local governments and industry to promote cooperation and information sharing;

- To establish a continuous improvement plan and process to design, develop, and implement technology-enabled business applications government-wide;
- To identify new opportunities for information resources sharing across public service agencies.



It is proposed that the CIO be located in the Office of the President in order to ensure political support at the highest level. The CIO would be supported by a secretariat which would comprise a policy unit, a business process re-engineering unit, and a technology and standards unit.

6.3.4.3 Coordinating Committees

The CIO would communicate through **two** high level committees. The first, a **Policy Committee**, would comprise eight to ten members involving senior management of the key IMST policy departments (DPSA, State Expenditure, Communications, Trade and Industry, and Arts, Culture, Science and Technology) as well as at least two large user departments and at least one or two provinces. This committee could also involve about four senior executives from the private sector to provide outside perspective on public service IMST policy and ensure closer adherence to international best practice. The purpose of the Policy Committee would be to assist the CIO in formulating overall IMST policy for government.

The second committee, a **Technology Forum**, would comprise the senior IMST managers from the key user departments and provinces. This Forum would seek to operationalise the policy formulated by the Policy Committee. Although the Technology Forum would be subordinate to the Policy Committee since it would deal primarily with the technology and systems aspects of policy, feedback to the Policy Committee would be ensured through the CIO whose office would act as secretariat to both structures.

In the case of both structures, specific IMST projects would be allocated to lead agencies as required. The Commission therefore proposes that the lead agency concept be used within the framework of an overall policy coordinated by the CIO. Such a lead agency approach will allow different functional agencies to take ownership of those elements of IMST policy which most closely align with their overall mission. It is also favoured by the current public service budgeting system since lead agencies focus on programmes and projects rather than departments.

The CIO's office will primarily set the guidelines for the functioning of IMST in the public service and will have no direct responsibility of operating their information management systems and

technology within these guidelines. The chief accounting officer of the individual agencies will need to certify on an annual basis that the agency's systems and technology conform to the guidelines. This compliance will be monitored by the Auditor-General's office. Only in exceptional circumstances, as in the case of the proposed procurement moratorium, will the CIO become directly involved with confirming the compatibility of IMST in the public service.

6.3.4.4 Re-engineering the South African Public Service

The Commission believes that the lead agency concept should not be promoted beyond the immediate requirements of actual cross-functional programmes. It however believes that it can be usefully combined with business process re-engineering when that is required by certain multi-functional programmes such as the National Crime Prevention Strategy. The Commission recognises that the manner in which structures, functions and organisations need to change as a result of departmental or provincial functions being rationalised is closely correlated to the manner in which these functions are themselves being transformed through the use of IMST. It may be that IMST is used as a means of promoting the right-sizing of the public service while at the same time enhancing the public service's capacity to deliver.

6.4 MEETING NATIONAL OBJECTIVES

6.4.1 Context

The national objectives of the current Government have very little in common with the previous Government's mission. Thus the systems and applications built by the apartheid government currently in use may not necessarily meet the new, democratic objectives. The Commission is concerned that IMST has not as yet been used in a systematic manner by the public service to improve service delivery, public participation, government transparency or accountability.

6.4.1.1 The Prevailing Focus and Priorities

During its investigations, the Commission discovered that whilst a number of departments have used IMST to improve their functional performance, such improvements have not occurred in any systematic manner. The focus has been on automation of operating processes some of which are now clearly obsolete and inadequate for meeting the new objectives of the public service. For example, Home Affairs are intending to use IMST to make information available to the public. However, it is not clear to what extent its information desks will be linked to general government information sources. Ideally, one could expect the public to make use of such information desks not only to learn about services offered by government, but also to apply for those services through the same service point. For this to happen, there would need to be a far greater degree on integration and/or inter-operability of public service (and perhaps even private sector) data banks.

6.4.1.2 Resource and Functional Duplication

From the presentations of departments such as Land Affairs, Health, Constitutional Affairs, Education, Welfare and Labour, the Commission received the impression that these different departments are investing significant resources in developing information systems whose purpose is primarily designed to assist the departments' management team in their strategic planning functions. Although these and other departmental systems would seem to be collecting much of the same data, we did not get the impression that this information would or even could be shared amongst themselves, let alone by other spheres of government. Apart from the waste of resources arising from duplication of information systems, the question needs to be posed whether this information could not be shared by means of Internet-type technology. With the appropriate security mechanisms in place, the information collected by these different information systems could be shared amongst different spheres of government and with the general public where appropriate.

6.4.1.3 Public Access to Information

There is very little indication that IMST is being used to provide public direct access to government services. With the exception of a pilot project in the Northern Cape which seeks to place all the information relevant to citizens on a computer system which can then be accessed at available computer terminals, little progress seems to be made in making use of IT to facilitate improved service delivery, even though this is one of the fastest growing areas of public service IMST provision elsewhere in the world.

6.4.2 Problems: Old Systems - New Objectives

The majority of the main IMST applications currently operating within the public service were designed more than a decade ago, and were based on philosophies, policies, procedures and controls that are out of kilter with the new spirit of open, democratic, accountable and cost-effective governance. Not only are they inaccessible to the public, they are also virtually inaccessible to the managers who are meant to use them. Despite the huge investment made in IT over the years, the IMST capacity within the service is also very low.

6.4.3 Precedents

In the state of Washington in the USA, citizens are able to access twenty state agencies ranging from vehicle registration and licensing procedures to health services, employment and study opportunities and small business assistance. Although the system is not fully integrated, people can search for jobs on the state-wide database and then make use of this information to get priority at a state employment agency when applying for a job. Many other state agencies in the US and elsewhere have made information available to the public that originates from operational systems through the Internet. Messaging technologies have evolved that are used to pull information out of older, disparate systems, store it in data warehouses, massage and aggregate it, and publish it on Web sites.

6.4.4 Options and Recommendations for "Electronic Government"

Fiscal constraints and the resulting pressure on government budgets makes the integration of information technology into all facets of the public service vital to meeting the service demands of the public. Information technology must not be applied haphazardly or sporadically. It also must not be used simply to automate existing practices. Instead, information technology must be seen as the essential infrastructure for the government in the 21st century - a modernized electronic government which allow citizens broader and more timely access to information and services through efficient, customer- responsive processes, thereby creating a fundamental revision in the relationship between the Government and everyone served by it.

The implementation of electronic government is probably the best way to build capabilities that enable the public not only to access information but to conduct transactions with government departments. The Government already owns most of the infrastructure for the implementation of electronic government and the private sector has the technology products. The Commission therefore recommends that government give serious consideration to migrating to completely electronic communication within the next five years.

There are a number of issues (ethical as well as technological and financial) that will still need to be resolved, however, before this happens. For example, given the Government's objectives to promote greater improved delivery, public participation, transparency and accountability, it will need to determine to what extent information collected, collated and analysed on public service systems can be and should be accessed by the general public. Once an individual's personal information becomes accessible through such a system, this will obviously raise important implications for privacy, since unauthorised and/or discriminatory use of such information could interfere with a person's constitutional and human rights. The costs and technical requirements for such a migration will also need to be fully studied.

6.5 PUBLIC SERVICE PERFORMANCE

6.5.1 Context

"Government must be accountable for results." This statement, voiced repeatedly by politicians and citizens, by the press and other watchdogs of government, is deceptive in its simplicity. It raises, but does not resolve, several fundamental questions: What are the desired "results" of government? How do we know whether government has achieved some intended result? What does it really mean to be accountable?

Since 1994 the concept of governmental accountability has taken on a new meaning. In this view, government demonstrates accountability when it shows its citizens: (1) what they are getting from the use of public funds in terms of products and services, (2) how these expenditures benefit their lives or the lives of those they care about, and (3) how efficiently and effectively the funds are used. This type of accountability holds government responsible not only for its actions, but also for the results and broader social impact of its actions.

6.5.2 Problems

There are **three** main and related problems with regard to IMST and its role in performance measurement and accountability in the public service. The **first**, as Chapter 2 demonstrates, relates to the inadequate nature of existing systems of performance measurement and management. Such systems guarantee little or no internal accountability, let alone external. The **second** relates to the limited use that has been made to date of IT in the operation of such systems. Current use of IT in the Public Service has not enabled it to maximise the benefits of IMST to improve efficiency and effectiveness. The **third** problem relates specifically to the lack of measurement of the performance of the IT asset itself. Little or no effort is currently being made to measure the return on IT investment, in terms of an assessment of the increase in personal and organisational productivity, improvement in service delivery times and the degree of public access to government information.

6.5.3 Precedents

The idea that information technology is critical to the operations of government has ample precedent in many countries in both the developed and developing classifications. The **National Performance Review (NPR)** is a United States' initiative to redesign and reform the operations of government and offers many insights into the use of IT to streamline functions, provide public access and re-engineer its processes to meet new objectives. The NPR seeks to:

- Improve public access to government information and services
- Implement nation-wide integrated Benefits Transfer system;
- Provide all Federal payments through Electronic Funds Transfer systems
- Address IT needs of the US Criminal Justice System

6.5.4 Recommendations and Options

6.5.4.1 For the Effective Measurement and Evaluation of IMST

To measure the effectiveness and performance of IMST systems it is necessary to define a starting point. The measuring criteria have to be developed and the baseline benchmarks set. These performance measurement criteria will need to be aligned with stated performance objectives. The criteria selected should be capable of measuring the following:

- User satisfaction with the environment and applications;
- Service delivery effort and times;
- Degree of public access;
- Degree to which applications meet specific departmental objectives.

6.5.4.2 For Performance Measurement and Management in General

Developing and implementing more effective systems of performance measurement and management, in which IMST is an integral component, represents a major commitment in time and money. To ensure that the benefits of such an investment are maximised, the Commission makes the following recommendations:

- It is important that all applications should include features that enable the automated collection of performance statistics. This is so that public service employees are not burdened with the task of compiling these measurements. In brief, all systems should recognise service delivery parameters and automatically report on them.
- Involvement and support from top management must be secured. In most of the research material studied by the Commission, leadership commitment to the development and use of performance measures was a critical element in the success of the performance measurement systems.
- Performance measurement systems must be aligned with the organisation's strategic priorities and goals.
- Employees (especially those on the front-line) and customers should be involved in the design of appropriate performance measures.

- Effective forms of communication (top-down, bottom-up, and horizontal) must be set up, to ensure the necessary "ownership" vital to the successful establishment and maintenance of any effective performance measurement system

6.6 OPERATIONAL REQUIREMENTS

6.6.1 Context

The operational requirements of the public service IMST environment are staggeringly complex. This complexity, as we have heard from most if not all departments, is in part due to the complex nature of the constantly evolving technology itself but is mostly due to the fragmented, un-coordinated and wasteful way in which IMST systems have been implemented in the public service over time. These problems have been mentioned before but need to be raised again because they are directly responsible for increasing the cost of operations for all departments. All the major transverse systems have been developed by external, private sector companies and the larger share of the budget allocation goes towards these companies.

The major IT investment over the years by the Government is one that has borne little fruit in respect of effective information management or the creation of skilled resources. This situation is further complicated by the current debates regarding the idea of outsourcing IMST capability to the private sector. It has been argued in some quarters that, as government IMST operations are already largely outsourced, it would make sense to formalise the situation and bring the environment under the rules of the marketplace. The opposing view warns of the dangers of abdicating responsibility for the management of an information resource that is seen as increasingly critical to the public service.

The requirements for efficient and effective IMST operations also need to be seen against the background of the challenges brought on by the issue of the Year 2000 and the Open Democracy Bill.

6.6.2 Problems

Citizens and government workers contend with an increasingly complicated array of government agencies, organizations, processes, and forms. The existing service delivery system is largely based on hierarchical design structures developed in the previous political era. The result is slow, inefficient service that does not satisfy actual customer needs. The information needed for sound decision making and high-quality customer service is not coordinated across government agencies, thus increasing cost and time to provide services. In short, today's government structures, processes, and business practices, which were designed for a different era, cannot keep up with the existing types and volumes of user demands.

The Commission's investigation into current transaction systems indicates that in most cases the procedures are only partially automated. Some of the systems (such as the Provisioning Management System the Basic Accounting System) have not been properly deployed due to problems in their specification, design and/or implementation even after hundreds of millions of Rand have been spent on them. As a result, most public service agencies largely continue to operate manual systems. Not only is it much more costly and difficult to ensure the integrity and security of manual systems (or part manual part automated systems), but such systems make error-checking and reporting virtually impossible. Investigations by the Commission suggest that the current systems, therefore, do not provide the necessary controls for an adequate financial management system.

A well-designed and coordinated IMST system can clearly help to alleviate this situation. But a number of important problems and challenges will need to be addressed in the process. These include:

- ***The Lack of an Integrated IMST Operational Strategy.*** This continues to be a major inhibitor. The operational autonomy of each government department, while laudable from a democratic perspective, has led to a "Tower of Babel" regarding technology standards and choices of environment.
- ***The Impact of the Year 2000.*** Resolving the problems associated with the "millennium bug" is becoming an increasing concern for most large organisations, including the South

African public service. It is estimated that the world will spend upwards of \$600 Billion to meet the unavoidable imperative of resolving the Year 2000 issue. The Minister of Finance has recently estimated in response to a Parliamentary question that South Africa as a whole would need to spend about R21 Billion to implement the necessary system modifications before the dawning of the new millennium. Beyond the cost of making systems Year 2000 compliant, the Commission is extremely concerned that current government agencies have not done enough to address the problem timeously. The implication of not having compliant systems is that the business of government, and the country as a whole, is likely to begin collapsing on 1 January 2000 unless urgent steps are taken immediately. The Commission however failed to detect such a sense of urgency amongst those tasked with ensuring compliance.

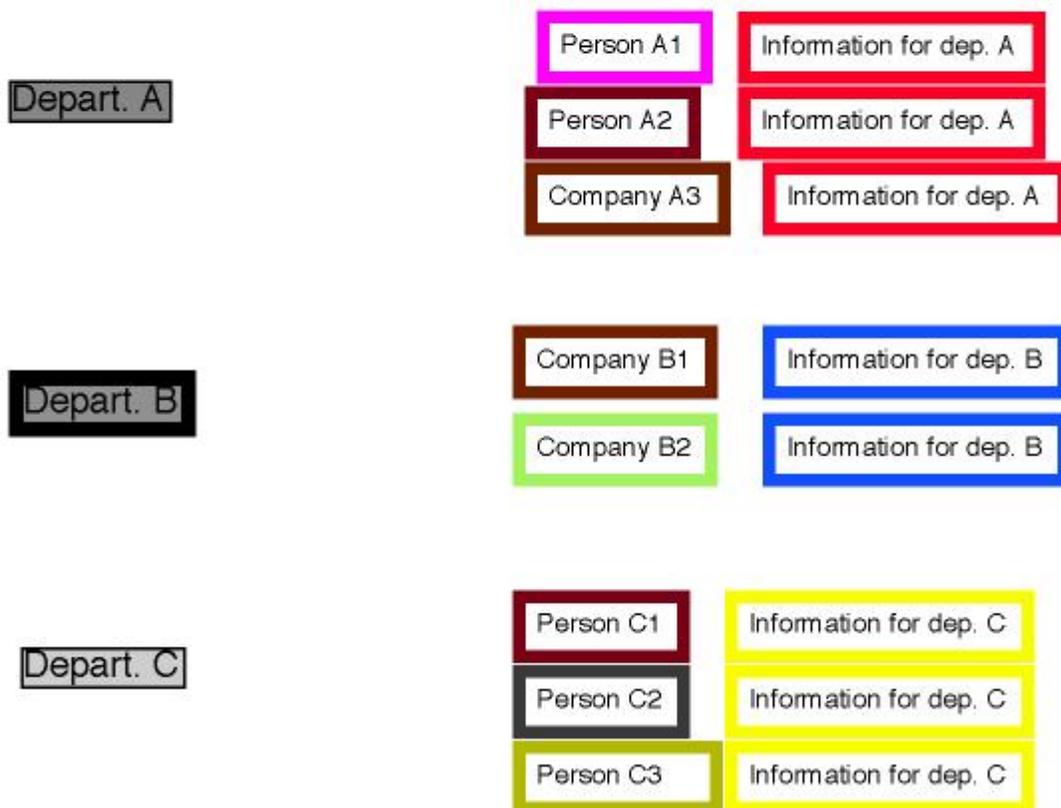
- **The Maintenance Burden.** The problems and issues surrounding the maintenance of equipment (both old and relatively new applications and systems) place a considerable strain on available resources. Applications such as PERSAL and PMS each consume upwards of R30 Million per year of operating budget and the largest expenditure goes into the salaries of the consultants and contractors who keep the systems running. Maintenance operations consume an inordinate proportion of available resources and yet contribute little to the advancement of either functionality or skills development.
- **Private Sector Influence.** The strategic and technological decisions taken by the public service have been influenced by a few large private sector companies that have won tenders and contracts to develop large sections of the IT infrastructure and accompanying applications implementations. These companies are usually in competition with each other and they have implemented technologies that are incompatible with each other. Because they have operated in a completely un-coordinated and isolated manner, they have taken the public service IT infrastructure in whatever direction suited their business purposes at the time.
- **The Skills Factor.** Operationally, skills cannot be transferred across departments or environments because each situation calls for vastly different skills and experience. This implies varying levels of resource duplication and reliance on outside, private sector entities to provide operating capabilities.
- **The Lack of Inter-operability and Integration.** The fragmented implementation of public service applications and systems has contributed greatly to the lack of data and function sharing that characterises the bulk of existing IMST systems. While the inability to share data among applications across departments is a serious indictment, the negative impact of the lack of integration and inter-operability on skill resources are more fundamental and far-reaching.
- **The Lack of Common Data Standards.** The lack of government-wide enterprise data models that are standard across all departments means that, even where physical connection between applications is possible, information cannot be readily shared and used in multiple applications.
- **The Lack of a Common Unique Identifier.** Although the business of the government departments requires that they uniquely identify persons and corporations, the current systems allow a situation where persons and corporations can have multiple identities both within the same system and/or across systems. The obvious problem of failing to register a unique identifier in the public service information systems is that information gathered in one system is not easily available in another. Apart from the cost of data duplication and re-entry, this situation has added to the burgeoning crime and corruption problem threatening to undermine the new public service, including the problems associated with "ghost workers" and "ghost beneficiaries."
- **Challenges associated with the Draft Open Democracy Bill.** Published in October 1997, the Bill is concerned primarily about public access to information held by governmental bodies but does go on to legislate on the ability to use and share that information with other bodies, public or private. The Bill presents two related challenges for IMST. The **first** is to set up IMST systems that can provide swift, inexpensive and effortless public access to the information managed by that system. The **second** is to

establish effective safeguards against the abuse of such systems, including the invasion of privacy.

6.6.3 Precedents - The Swedish Unique Identifier

The Swedish system is based on the recent theories of object-oriented modelling, where identity (both personal and corporate) is understood as an object that has different significant properties depending on the needs of particular user departments. Each user department requires certain base information about each identity object (usually an unambiguous identification number) in addition to information specific to that agency. For instance, tax authorities may require an unambiguous identity plus information about income and tax status. The criminal justice system on the other hand also requires an unambiguous identity, but the data it identifies would be mainly concerned with information concerning criminal status. Depending on the legal limits of information sharing between functional departments, departments may co-operate on a wider information exchange (i.e., welfare may be interested in beneficiaries' income sources, while the revenue services might like to know who receives additional income).

Information registers - also covering partly overlapping groups

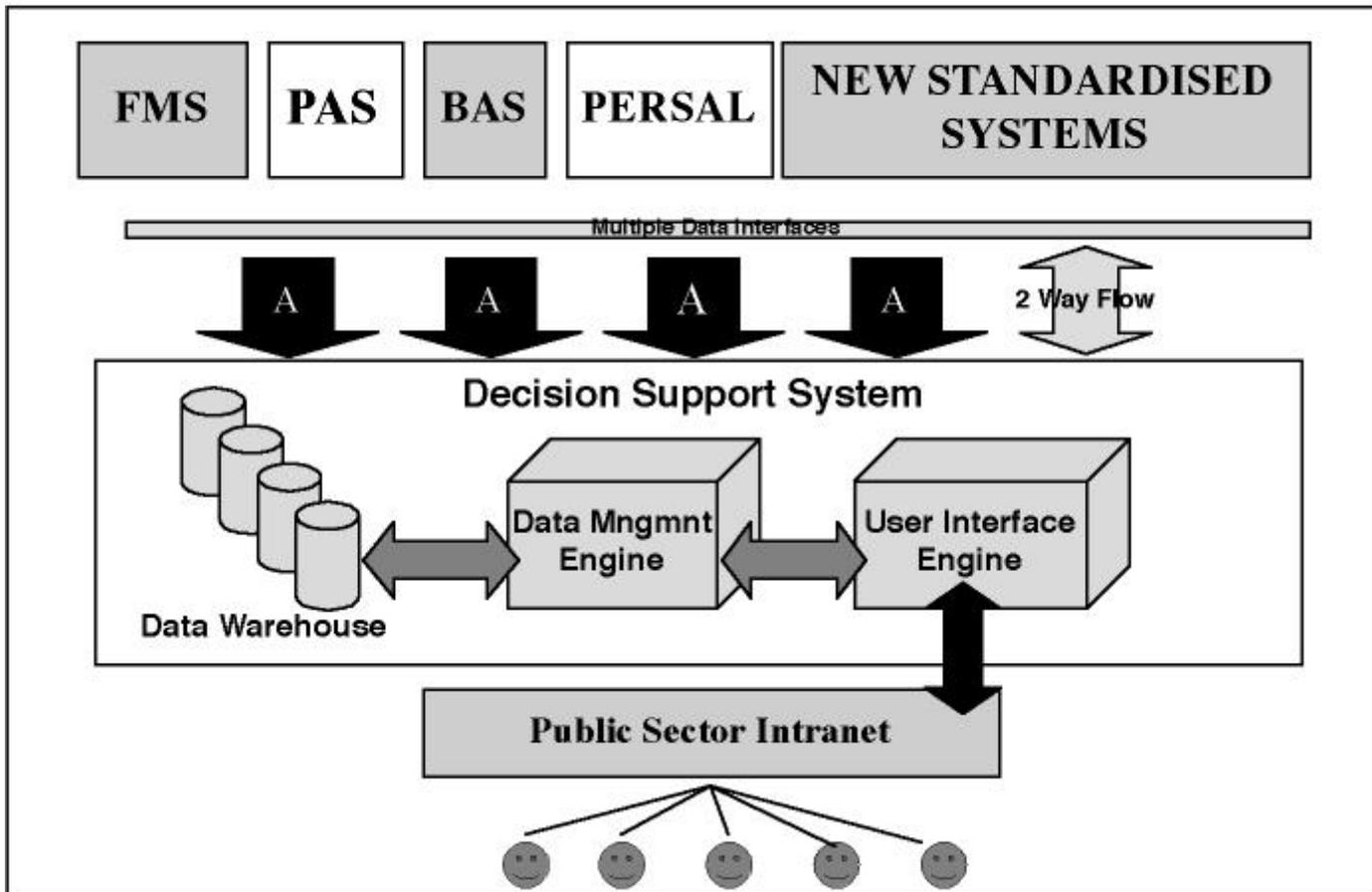


The Swedish system has the added advantage that the data captured in the base register facilitates an individual's or corporation's relationship to the main public and private sector agencies with which they needed to interact. For instance, by filling in one change of address form at the post office, the individual or corporation could be sure that all state agencies and most major private sector agencies (banks, insurance companies) would update their records accordingly.

6.6.4 Options and Recommendations

The successful transformation of the IT infrastructure is key to the fulfilment of the overarching goal to move South Africa's population into the information age. Government IMST is so large that, if planned and managed properly, it could form a significant cornerstone for universal and open access to the information technology revolution. The Commission accordingly recommends the following options and proposals for consideration.

Migratory Environment



6.6.4.1 Investment Protection

The approach taken to transform the IMST capabilities of the public service must ensure that the large investment the state has made over the years is protected. While it may be ideal to scrap all applications and rebuild or re-source them through a "big bang" approach, the Commission feels that this would not be practical nor even feasible. What needs to happen is the **careful migration and adaptation** of the current infrastructure to the new, mission-aligned environment. Research into existing technologies indicates that there are "off-the-shelf" product offerings that will facilitate the migration of current systems to Internet type technology.

It is proposed that existing stable systems be "wrapped" with a new user interface which will allow new capabilities such as "decision support" to be tacked onto existing systems. For example, the FMS and PERSAL mainframe applications should be provided with a PC-based user interface which allows the user departments to both directly input data on-line and also to draw up reports using commonly available reporting packages. Communication to the mainframe could be facilitated through the use of Internet technology where direct connections are possible and mobile data capture facilities in remote rural offices. Since these user interfaces would be using standard applications they could be designed to adapt to any new financial management applications when such are deployed in the future.

6.6.4.2 The Technology Acquisition Process

The Government must also expedite and simplify how it acquires information technology. The market for computer hardware and software involves products for which the shelf life can be as short as a few months. In this environment, the Government needs aggressive, innovative purchasing methods. The traditional means and procedures of acquiring technology-based solutions should be replaced with a real-time, on-line electronic marketplace.

6.6.4.3 Resolution of the Year 2000 Issue

The Year 2000 problem has to be resolved by the Government as a matter of urgency. The Commission believes that emergency measures may now have to be undertaken to ensure that the systems are Year 2000 compliant. The global consensus is that it is now already too late to indulge in a "business as usual" approach and the problem has to be tackled in major crisis mode. The convening of a 'Crisis 2000' project office (as opposed to a committee) should be undertaken as a matter of priority. The Crisis 2000 Office should have the following objectives:

- The coordination of all Year 2000 initiatives;
- The overall project management of Year 2000 projects;
- The liaison with similar private sector initiatives and projects;
- The responsibility for milestone tracking and reporting.

It has also been argued that existing systems vendors should be held liable for ensuring Year 2000 compliance since there exists no contractual understanding that the systems would not operate after 1999. As a matter of urgency, all existing vendors should be required to provide detailed (and independently audited) assurance that their systems are compliant, and if no assurances can be given, legal action should be instituted.

6.6.4.4 Implementation of Unique, Unambiguous Identifier

The Commission believes that the development of a unique, unambiguous identifier, along the lines of the Swedish model, is one of the fundamental building blocks of any future public service IT strategy. It is not possible to over-emphasise the critical role that such an identifier will play in enabling information sharing and access among different applications. The IMST implications of the Open Democracy Bill bring additional urgency to the quest for an identifier. We therefore strongly urge government to develop and implement such an identifier as a matter of urgency, paying due regard to the important issue of building in safeguards to protect confidentiality and privacy.

6.7 HUMAN RESOURCES DEVELOPMENT AND TRAINING

6.7.1 Context

To achieve and sustain high performance organizations in the public service, personnel policies and human resources management systems must adopt a new way of thinking about the people who work in the organizations. People have been traditionally viewed as costs rather than assets, and have been appreciated for narrowly defined skills rather than for their individual uniqueness, competencies and potential. Chapter 2 of this report has highlighted a range of problems and challenges facing the public service with respect to human resources issues more generally. In many ways these problems are more glaring with respect to information technology, in part because IMST tended to be treated in the past as merely an operational tool understood only by relatively junior personnel somewhere in the bowels of the organisation. Fortunately, this sorry situation is now coming to an end, as a new breed of managers are beginning to have a sense of the larger organisational impact that information management capabilities bring forth.

6.7.2 Problems

Every year, increasing numbers of government workers are expected to use information technology skills and knowledge in performing their jobs. However, many members of the public service workforce lack sufficient training and background to use new technologies effectively, and many managers fail to realize the importance of IMST training.

Key challenges and problems that face the service in relation to IMST training and development include:

- **The Low Level of Investment in IMST Training.** Government agencies rely on information technology and are increasingly dependent on the skills and capabilities of

their workforce to enhance productivity and ensure quality service to the South African public. Yet compared with private industry, the National Government invests very little money or time in IMST training and retraining, and provides few incentives and opportunities for its employees to seek IMST education and training. Without this investment, the government workforce will be increasingly unable to keep pace with the rapid changes in technology and improved methods of customer service.

- **Training and the Procurement System.** The National Government spends billions of Rand each year on IMST contracts and acquisitions. A majority of the contracts and acquisitions do not include training provisions in the initial design stages, thus placing a tremendous burden on the overall agency training budget.
- **The Lack of Executive and Senior Manager Awareness.** Senior managers have not developed the kind of experience and expertise in IMST that they have in finance, human resources, and accounting. At a minimum, they need a basic knowledge of how to ensure the development and use of management information systems and other technological resources that meet their agency's needs.
- **Participation of Black People and Women in Public service IMST.** In terms of the representation of Black people and women in IMST, this is an area where public service performance is still particularly dismal. Historically, they have found little opportunity to be significant participants in the IMST operations of the state.
- **The Lack of Career Development Opportunities.** The inflexible rules that determine the position, post classification, remuneration and promotional opportunities for IT personnel are set up and implemented in a way that takes little account of the realities of the IMST skills marketplace. In the context of an increasing global demand for IMST skills, the persistence of these rules make it possible for a public service IMST professional to double and in some cases to triple their remuneration packages and enhance their career development opportunities by moving to a position in a private sector organisation, either in South Africa or overseas.
- **The Costs of Low Investment in IMST Skills Development.** The costs of inadequate IT training and development are significant. In the worst-case scenario, people do not use their computers at all, and the organization's investment in hardware and software is wasted. In a less extreme circumstance, every time a user relies on a formal support function rather than performing IMST work on his or her own, the organization incurs significant overhead and salaried costs.

6.7.3 Precedents

The costs of providing IMST training in through traditional methods have been a constraining factor in both private and public institutions. To meet this challenge, initiatives in the West and especially the USA are increasingly focused on providing training through the Web part of the Internet. The convergence of telecommunications, telephony, and computing has made possible this evolution from the traditional educational model to a new learner-centred model. The state of New York, for example, has begun investigating the possibilities of using the Web as a mechanism to provide in-service training videos for its employees. Under such a plan, employees would be able to access training films and other course materials whenever their schedules allowed. The use of these new forms of in-service training and development clearly needs to be seriously considered by the South African public service, not only for the training and retraining in IMST skills but in a much wider range of skills development.

6.7.4 Options and Recommendations

6.7.4.1 Principles Underpinning Future IMST Training and Development

The Commission believes that the future development of IMST skills training and capacity building in the public service should be governed by the following key principles:

- Public service partnerships with private sector IMST training providers;
- A strong link between training and individual career development;
- Internationally recognised accreditation;
- Alignment with the National Qualifications Framework (NQF);
- Open access.

6.7.4.2 The Need for a Skills Development Plan

The Commission proposes that an emergency skills development programme of education and training be initiated to train IT personnel in the public service. This will have **two** overlapping strands. The **first** will be modeled on the SYSTEM approach to science and technology training. The SYSTEM method, which has targeted matriculants and "second chance" students, has already produced 900 graduates ready for a science and technology career. The Commission proposes that the SYSTEM programme should be boosted to ensure that their current throughput of 1 200 graduates be increased to the targeted 10 000 originally envisaged by the programme designers. The **second** strand of the skills development plan is that SYSTEM graduates and other qualified science and technology matriculants be drawn into a four year internship programme. The internship programme, which would alternate education with practical training should provide an accelerated four year qualification equivalent to current tertiary qualifications. It is proposed that the public service consider training between 500 and 1000 interns annually depending on the availability of suitable entry candidates. The state will benefit by having a flow of relatively cheap IT personnel for a four year period with the possibility that some will remain in the public service. Given that the current turnover of IT personnel is 18 to 24 months, this will increase the retention rate within the state sector. In addition, the IMST industry in South Africa will also benefit from there being a larger pool of graduates. It is proposed that to ensure suitable exit standards, and perhaps even to share costs of the internship programme, the private sector should be involved in the design and funding of training and practice modules.

6.7.4.3 Public Service Executive IMST Awareness Programme

There is an urgent need to address IMST competency at the executive and senior management levels. Including IMST competency in an executive awareness programme will emphasize IMST as an integral part of the continuous and comprehensive learning organisation. In order to provide basic knowledge, courses should be organised to provide insight on how to integrate technology into the workplace, to use new technology to manage and improve programme effectiveness, and to explain the impact of technological changes on the organization.

6.7.4.4 The Participation of Black People and Women in Public service IMST

The Commission recommends that the public service should seek to redress the lack of participation by Black people and women in this important aspect of their operations. A focused attempt should be made to enable the entry and progress of young Black people and women in the IMST sections of government departments. The "Marshall Plan" outlined above should help in

this regard. In addition it is proposed that a funded, focused programme be established, directed at the single purpose of bringing more Black people and women into IMST.

6.7.4.5 New Forms of Education and Training for IMST

Examples from overseas have highlighted the benefits to be gained by the use of the electronic media in both formal education and training, as well as in-service programmes (not only for IT staff, but also for other employees and indeed the public). These include:

- Lower cost to deliver courses and training materials to students and staff. Courses that would otherwise be difficult to offer at some locations because of limited enrolment or lack of faculty in a specialized area are now possible;
- Greater opportunity for collaboration and sharing. The Web increases opportunities for collaborative work and sharing of information, ideas, and courses among different locations;
- Greater access to courses that can be taken any time, any place. Such courses can be delivered to a learner at a campus, at the office, or at home;
- Greater access to research and reference services.

The quicker the public service workforce embraces the possibilities of information technology, the sooner the initiatives of electronic government can become a reality benefiting the public. By re-engineering through information technology, the public service could provide the leadership, vision, and commitment to bring government into the information age.

6.7.4.6 Career Development

If the IMST divisions in the various government departments are to consistently achieve high performance, a number of human resource issues which are underlying prerequisites for success must be addressed. These include:

- *Recruitment*: The best and brightest candidates must be recruited into public service;
- *Employee Skills/Abilities*: Employees must be motivated, efficient, and creative. They must be proficient in a wide range of skills and continuously add new competencies;
- *Remuneration*: Must be comparable to the private sector;
- *Accountability*: Public workers must be held accountable for results. Rewards and promotions must go to the best. Meanwhile poor performers need to be supported to improve and address deficiencies;
- *Job Satisfaction*: Jobs must be enriched. A productive work environment values and supports teamwork, collaboration, and active participation by workers;
- *Workforce Diversity*: The workforce and work rules must be structured to fully utilize the skills and capabilities of all employees;
- *Quality of Work Life*: Quality of work life issues must be addressed through support systems that meet the changing needs of employees and their families.

It may become necessary to implement changes in the public service career development process to recognise the basic differences between the more "normal" public service employee and the IMST professionals. The current high market demand for IMST skills mandate an approach that may seem radical and unfair to other types of government employee. If the public service intends to develop and retain any significant pool of skilled IMST resources, it is imperative that it be enabled to compete on an equal basis with the general IMST skills marketplace.

6.8 FINANCIAL AND BUDGETARY REQUIREMENTS

6.8.1 Context

6.8.1.1 Maintenance of Legacy Systems

Many of the problems described above are ultimately linked to the financial and budgetary constraints facing the public service. Currently the bulk of the funds allocated to IMST are being used to keep existing legacy systems operational, since new public service managers often seem to believe there are no funds to adopt new systems. Where new systems are being

commissioned, these are often supplementary to legacy systems that continue to carry the burden of public service transactions.

6.8.1.2 Procurement Process

Where new systems are being acquired, they often go through an unwieldy process of procurement that seems to have little ultimate effect on the quality of system procured. At the moment there also seems to be a mad rush by departments and provinces to acquire systems which may address their immediate service delivery requirements but which have no relation to other systems being procured elsewhere. Not only are there no basic standards agreed to, but also in many cases, different departments are acquiring very similar but not necessarily compatible systems. All these problems exacerbate the budgetary constraints currently being experienced and could add up to mounting financial problems in the future.

6.8.1.3 The National Imperative

In proposing changes in the use of IMST in the public service, the Commission is sensitive to these constraints but is at the same time aware that the ultimate cost to the nation of not having the appropriate IT systems may be far greater than any immediate short-term savings may imply. The Commission believes that a set of basic standards should be agreed to prior to the acquisition of further large-scale systems, regardless of the short-term delays that may arise. It also believes that new procurement models for IMST should be explored in order that the procurement, operating and system development risks and rewards can be equitably shared between the public and private sectors.

6.8.2 Problems

- **Inadequate Funding of IMST.** Although there are no absolutely reliable figures on total IMST costs in the public service (itself a cause for concern), it is estimated that such costs are currently in the region of R2-2.5 billion annually. This represents approximately 1.5% of the total budget. By contrast the private sector in South Africa spends about 3-5% of their total budgets on IMST.
- **Value for Money.** It is also doubtful if the public service is getting value for money from its current expenditure. For example, approximately 34% of IMST spending is taken up by consultants' fees. It is estimated that if such services were to be performed internally or by a parastatal such as INFOPLAN, between 6% and 10% of overall costs could be saved.
- **Procurement Problems.** While the commission would not advocate the abandonment of appropriate procurement procedures, there is no doubt from the evidence presented by departments and provinces that current policies are unnecessarily tedious and overly bureaucratic. There is also little evidence that they have provided the best possible IT solutions. In this context the Commission notes with concern that the Green Paper on Public Service Procurement had virtually nothing to say about the unique problems of IS and IT procurement. It is proposed that this be addressed in the forthcoming White Paper.
- **Lack of Tender Board Expertise.** Many departments and provinces complained about the complexities and delays involved in the tendering process. Representatives from the state Tender Board, however, pointed out that most delays experienced with the tender process arose because departments did not understand or follow the correct procedures. This argument was acknowledged by a number of departments, who nevertheless believed that tender regulations should be revised and made clearer in order to expedite the acquisition of goods or services.
- **Life Cycle Costing and its Application.** There was little evidence that life-cycle costing is applied (through systems such as the System Development Life Cycle for example). This would seem to suggest that current systems may not be cost effective if their operating and maintenance costs are taken into account.

6.8.3 Precedents

Australia has transformed its procurement system on the belief that freeing good people to make smart business decisions will generate huge administrative and contract cost savings. The

evidence suggest that this has worked well. The concept of letting managers get value for money, make smart business decisions and be accountable for results still remains largely foreign, however, in the South African public service.

In the procurement and operation of state assets, the Canadian Government has made significant advances promoting what is called the **Alternative Service Delivery** (ASD) model. Unlike the Private Finance Initiative (PFI) in UK which tried to subject every asset or service acquisition to a privatisation test, ASD posits a range of service delivery options involving a spectrum of public, private and non-governmental agencies. The ASD approach seeks to encourage new relationships in service delivery without the government abdicating its ultimate responsibility for governance.

The mechanisms developed for ASD include the following:

GOVERNMENT HAS NO RESPONSIBILITY FOR OUTCOMES	GOVERNMENT HAS JOINT RESPONSIBILITY FOR OUTCOMES	GOVERNMENT REMAINS RESPONSIBLE FOR OUTCOMES
devolution	separate service agency	Commercialisation
recognition	special purpose body	cost recovery
privatisation	community corporations	internal delegation
franchising	mixed enterprise	internal partnership
licensing	joint venture	special operating agency
self-regulation	regulated monopoly	single-window service
de-regulation	regulatory agency	co-location
	community board	community offices
	collaborative partnership	common services
	external purchase of service	merging systems
	joint financing	electronic delivery
		self-service

It is not the Commission's intention to suggest that all these mechanisms be considered as procurement options for IT assets and services, but rather to indicate that there may be many options beyond direct delivery, outsourcing and privatisation. In the next section, some of these alternatives will be considered.

6.8.4 Options and Recommendations

6.8.4.1 Mission-Driven, Results Oriented Budgeting

Reform of the financing and budgeting of IMST must be located within the context of broader processes of budgetary transformation, along the lines suggested in Chapter 3 of this report. The new approach to budgeting will need to be mission-driven, and capable of linking purpose, resources and results to promote a more effective system of service delivery that combines quality with value for money. Such an approach should encourage long-term thinking and help political leaders and senior managers to make better choices and set effective but realistic priorities. It should also help to remove needless constraints on managers' use of resources, to encourage innovation and provide positive incentives to manage effectively, to cut wasteful spending, and to convert accountability for spending money to accountability for achieving results.

6.8.4.2 Transforming Procurement

The Commission believes that there is an urgent need for fundamental procurement reform. In some cases, the solutions require legislation. But most importantly, they require a new direction and model for organisational control, one that depends on empowered managers and employees

held accountable primarily for external results, not internal rules. This will involve freeing managers and employees from excessive laws, all accompanying regulations, and internal agency barriers that stifle innovative customer service. The government procurement system needs to be recognised as an administrative process that balances the cost of the system to taxpayers and vendors, the line manager's needs, and the nation's socio-economic goals. The law's main role should be to set public policy goals and sensibly protect the system against fraud. The Commission also believes that the new system for procurement must provide value for money and be driven by customer service rather than the needs of the bureaucracy. Public service managers need responsive, efficient, and innovative procurement services delivered by procurement officers with whom they can develop a tested, long-term relationship. Together, line managers and procurement officers must shift from a system of procurement focusing on regulation for the sake of regulation to a system balancing value, price, fairness and the empowerment of SMMEs to produce a truly cost-effective system. In considering options for the procurement of IT assets and/or services, the Commission recommends that a number of options be considered, including:

- The **Alternative Service Delivery (ASD)** approach outlined above, where the risks for development, ownership, operation and upgrading are shared by those public and private sector agencies best suited to carry that risk. If this approach is used in conjunction with the life-cycle costing of alternative bids, it should help balance the risks and ultimately the costs faced by the public service. One South African example of an ASD type IMST procurement approach is the subsidy management system used by the Department of Housing. The subsidy management system was developed by the Council for Scientific and Industrial Research (CSIR) and its private sector partners in a relationship where the partnership carried the bulk of the development risk. Housing was only required to pay for a working system. The partnership also undertook to train SMMEs who would thereafter takeover the support functions.
- The **Request for Solutions (RFS)** approach, recently pioneered by the Gauteng Corporate Informatics Department. In essence the method focuses on defining user needs internally, and then relying on vendors to come up with appropriate solutions. This attitude is in line with the belief, endorsed by the Commission, that the risks and rewards of systems development, operation and maintenance should be carried by the parties best qualified to accept them.

Finally, the Commission believes, as stressed earlier in this chapter, that the interests of the country would be served by a **short-term moratorium** on IMST procurement, while agreement is reached on the basic features of all new systems. We propose that an inter-ministerial task team be established by the President with a short-term deadline to agree on the basic standards for a new policy. This should be led by the Minister of Finance and involve all the key IMST ministries and departments. In order to ensure cooperation and buy-in from line function departments and provinces, a number of focus groups should be convened as part of this exercise.

6.9 SUMMARY OF MAIN RECOMMENDATIONS

In this chapter of the report, the Commission has identified many problems and challenges facing IMST and has made a large number of recommendations for overcoming them. In doing so, it has relied both on the expertise of public servant currently engaged in addressing the problems and on international precedents. It is our belief that these recommendations will assist those in the public service who are already active in trying to address the problems identified. The following section provides a brief and by no means exhaustive summary of the key recommendations made in the report.

6.9.1 Procurement Moratorium

The most immediate recommendation is a short-term (two-three month) procurement moratorium on all large (above R5 million) information management systems and technology until some basic standards are agreed to facilitate future data exchange and inter-operability. It is proposed that the process to agree upon the basic standards be driven by an **inter-ministerial task team** and

involve all affected departments and the provinces through focus group and working group structures.

6.9.2 Basic Building Blocks

The procurement moratorium would be designed to create the political will to get the public service to agree on some basic standards. The most immediate need would be for standards required for exchange of information between different systems. The **unique identifier** plays a crucial role in that respect, but network standards will also be required. Common formats for electronic exchange of information between government and private institutions, companies as well as the public, should also be established based on Internet related techniques.

6.9.3 Business, Information, Systems and Technology Architecture

The short-term procurement moratorium would merely supply the basic building blocks for a more comprehensive set of standards. Ultimately however, there would be a need for a more holistic business, information, systems and technology architecture for the public service. Such an architecture could be derived from the current IT Business Architecture and/or subsequent projects.

6.9.4 National IMST Strategy and Implementation Plan

The Commission proposes that the above projects be consolidated into a national information management strategy, information systems strategies and an information technology strategy for the public service. Such a strategy would of course need to be in line with any national information society strategy for the nation as a whole.

6.9.5 Chief Information Officer

It is proposed that a Chief Information Officer (CIO) be located in the Office of the President to coordinate all public service IMST initiatives. The CIO would have a support staff and would interact with the rest of government and the private sector through **two** new committees which would also need to be established. These are:

- A **Policy Committee**, comprising senior managers of those departments and/or provinces engaged in general IMST policy as well as including a number of some private sector managers;
- A **Technology Forum**, comprising the IMST Managers from the key user departments and provinces.

6.9.6 Lead Agency Concept

In developing the above standards, architectures and strategies, the Commission proposes the acceptance and introduction of the lead agency concept whereby a particular state agency would be given primary responsibility to coordinate a whole-of-government IMST initiative in relation to a specific set of IMST functions in conjunction with other participating departments. In order to ensure inter-agency cooperation, personnel and resources would need to be shared on a programme and/or project basis, but ultimately the Minister and Senior Management responsible for the lead agency would be held accountable for performance.

6.9.7 Business Process Re-engineering

Coupled with the lead agency concept, which is largely a short-term measure, the Commission proposes that in the medium to longer term the current functional differentiation of the public service be address on the basis of business process re-engineering. It is proposed that the current re-engineering arising from National Crime Prevention Strategy serves as a model for such a business transformation of the public service.

6.9.8 Skills Development Plan

In order to address the critical skills shortage in IMST in the public service, the Commission proposes that a systematic skills development plan be designed and implemented to train new entrants to the information management and technology field. This will entail in particular a new four year internship programme which would lead to an accelerated but nevertheless equivalent qualification to those currently offered by tertiary institutions. Although this programme would be open to all, special emphasis should be given to seeking interns from historically disadvantaged communities to ensure that representivity is addressed.

6.9.9 Electronic Government

The implementation of electronic government is probably the best way to build capabilities that enable the public not only to access information but to conduct transactions with government departments. The Commission therefore recommends that government give serious consideration to migrating to completely electronic communication within the next five years.

6.9.10 Public/Private Risk and Reward Sharing

The Commission proposes that new procurement models be used in the development, operation, maintenance and upgrading of information management system and technology. It suggests that the 'alternative service delivery' models and the 'request for solution method' be explored to ensure that risks and rewards are appropriately shared between the public and private sectors.

6.9.11 'Crisis 2000' Project Office

The Commission believes that emergency measures have to be undertaken immediately to ensure that the systems are Year 2000 compliant. A 'Crisis 2000' project office should be convened immediately. It would coordinate and project manage all the Year 2000 initiatives in the public service in liaison with similar private sector initiatives and projects. It would also undertake responsibility for milestone tracking and reporting to the Office of the President on these initiatives.

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