

Information technology skills for the South African public service

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ABSTRACT

This article aims to identify those information technology skills expected to be part of a public servant's professional ways of being. This is done through a survey of the South African government's policies and plans for information technology and initiatives currently taking place, by categorising the different types of information technology skills needed by public servants, and by assessing the usage of information technology in the private sector. The need for equipping public servants for their profession as public servants is contextualised within the theories regarding professional ways of being and enactivism. Bearing in mind that ICT knowledge and skills are regarded as some of a public servant's professional ways of being, and that public servants need to learn their professional ways of being through professional academic education programmes, this article recommends that further research be done on how ICT knowledge and skills can be facilitated through the current academic programmes offered to educate public servants.

INTRODUCTION

The European Institute of Public Administration (2005:17) states that the use of information technology, the internet and the development of e-government implies a modernised way to provide services, share data, communicate, complete tasks and work in any government. The South African government is also aware of the important role that information technology can play in transforming government, and providing information and public services to citizens. The need for information technology skills was highlighted as important for the first time in South Africa in 2002 when the South African Minister of Public

Service and Administration stated in the Budget vote speech that government spent an estimated R3 billion per annum on information and communication technology (ICT) goods and services, but that only 20% of public servants were computer literate. The public service is, according to this Minister, in need of new skills to develop officials' ability to use information and communication technology (ICT) and improve the public service. (Minister Geraldine Fraser-Moleketi 2002). More recently, this was reiterated in the State Information Technology Agency (SITA) 2008 Annual Report, which stated that the shortage of information technology skills in South Africa is a major challenge in the public sector and, in order to be able to transform the government, the technology skills of public servants must be developed. The importance of computer skills for public servants in the United States of America (here after referred to as US) was highlighted in 1988 when the National Association of Schools of Public Affairs and Administration (NASPAA) added computing as a skill in the Masters of Public Administration (MPA) programme (Pavlichev & Garson 2004:264). Northrop (1999:14–15) confirms that a person looking for employment in the US government will be expected to have some computer skills.

Bearing in mind that public servants are supposed to use information technology in the process of rendering service to the public, one can expect them to have the skills and knowledge necessary to understand how information technology can be used to accomplish or improve government processes and procedures. This expectation is valid in view of the fact that professional education programmes offered by higher education institutions are charged with the task of preparing professionals for practice (Dall'Alba 2009:34). If the ability to use information and communication technology is regarded as one of the "professional ways of being" (Dall'Alba 2009:44) of a public servant, it is necessary to know what ICT knowledge and skills are regarded by the professional environment of South African public servants as part of their "professional ways of being".

The purpose of this article is consequently to identify those information technology skills expected to be part of a public servant's "professional ways of being" (Dall'Alba 2009:34) in order to function effectively in the public service. This is done by, firstly, surveying the South African government's policies and plans for information technology and initiatives currently taking place, secondly, categorising the different types of information technology skills needed by public servants, and thirdly, briefly assessing the usage of information technology in the private sector. The article consists of a comprehensive review of official documents as well as a review of the relevant scholarly literature, such as books and journal articles. This review will aim, not to establish whether a gap exists between the various policies and implementation plans on the one hand and the actual implementations on the other hand, but to find out what typical

information technology skills are expected from public officials. As the public service can be regarded as the professional environment for public servants, the use of information technology in the public service will be examined in the following section.

THE USE OF INFORMATION TECHNOLOGY IN THE PUBLIC SERVICE

The use of ICT in the South African public service will be surveyed with the world-view “enactivism” in mind (Li, Clark & Winchester 2009:405). This world-view argues that “cognition and environment are inseparable, and ‘systems’ enact with each other from which they ‘learn’” (Li, Clark & Winchester 2009:405). For the purpose of this study, the public service will be regarded as the environment and public servants as the systems enacting with this particular environment. This section will focus primarily on the use of ICT by the public service as environment.

According to the Economic Commission for Africa (2003), information technology is one of the key strategies that governments can use to reform and improve public service delivery. Information technology also improves accountability in government by making information quickly and easily available to citizens. It also allows citizens to participate more effectively in the global information economy, society and government. The E-Government Toolkit (2009) states that the use of technology by governments can benefit the public service, business and society in general. In addition, according to the Organisation for Economic Cooperation and Development (2002), technology gives government the opportunity to offer public services and to provide information and execute policies more efficiently. The Organisation for Economic Cooperation and Development (2002) also states that if more public services can be delivered through technology, government can save time and money by processing documents (eg licences) and collecting taxes electronically.

Brown and Brudney (1998:423) state that apart from saving time and money, technology can streamline work processes, enable easier access to information, assist in providing better products, improve decisionmaking, speed up transactions and provide better data security. Lodge and Kalitowski (2009:39) state that technology has developed quickly over the past decades, and was initially embraced by the private sector to encourage innovation. The public sector, however, can also benefit by making use of information technology to improve innovation and productivity, reduce costs and create new ways of providing public services.

More recently, computer technology has paved the way for the development of a knowledge-based economy and information society. According to the South African Department of Trade and Industry (DTI 2009) the internet, for instance, has contributed to the development of new applications and services in the areas of knowledge management and communication that can be used by governments to educate, inform and provide services to citizens. The use of technology at work and at home has increased worldwide. According to the Department of Trade and Industry (DTI 2009) the amount of information on the internet is estimated to double every 100 days. The demand for and use of information technology in a knowledge-based economy and information society has prompted many governments to provide citizens with more information and better services by making use of technology (DTI: South African ICT sector development framework 2009). The South African government has launched various information technology initiatives, which highlight the important role that information technology already plays and will continue to play in the future. These initiatives, whether successfully implemented or not, serve for this article at least as indications of the professional ways of being of public servants with regard to information technology skills. These initiatives will be surveyed next.

Government initiatives confirming the importance of information technology in South Africa

In South Africa, the government has rhetorically accepted the importance of the growing information society and the benefits of using technology in government. The South African government's commitment to improving information dissemination and use across the population was illustrated as early as in 1995, when Mr Thabo Mbeki (the then Deputy President of the RSA) stated at the G7 Information Society meeting in Brussels that "we must strive to ensure that each individual, whatsoever his or her station in life, plays a meaningful role in decision-making and in governance. One of the ways this can be done is to ensure that citizens have access to information" (Mbeki 1995). The South African government published a *Green Paper on E-Commerce* in November 2000 (Fraser-Moleketi 2002) in order to make people aware of the influence that information technology has and could have on South Africa. The *Green Paper* (2000:15) formulates the view of the South African government regarding the influence of information technology as follows:

... the increasing pace of technological innovation such as the rapid integration of the Internet and other telecommunications based activities into nearly every sphere of life has given rise to new ways of communicating, learning and conducting business. The Internet has facilitated the

establishment of a borderless environment for communications and the electronic delivery of certain services. Convergence of technology is the major driving factor that contributes to the exponential growth of electronic commerce. Convergence goes beyond the use of technology to develop new products and services and is seen as a vehicle to improve the quality of life of society in South Africa and other developing countries (South Africa Department of Communications *Green Paper on E-Commerce* 2000:15).

Along with the *Green Paper on E-Commerce*, the Department of Public Service and Administration was mandated to promote the use of information technology to improve public service delivery in South Africa. One of the projects that was undertaken by the Department of Public Service and Administration was the development of the State Information Technology Agency (SITA), which was established in 1999. SITA was mandated to provide information technology products and services to government institutions across the three spheres of government, namely national, provincial and local government. SITA, thus, is responsible for providing information and communication technology as a strategic resource to the South African government (SITA 2007). Apart from SITA, the Department of Public Service and Administration was mandated by government to promote the use of information technology and information management to improve service delivery in the public service (DPSA 2009a). Whether or not SITA and the Department of Public Service and Administration were successful in executing their respective mandates, the mere fact that they were mandated is an indication of the importance of information technology for the South African government.

To meet this mandate the Department of Public Service and Administration led the process in establishing the Government Information Technology Officer's Council (GITOC) (DPSA 2009b). The Council assists government on a continuous basis by intervening in the interests of enhancing service delivery for citizens (DPSA 2009b). The Council also participated in the formulation and development of an information technology security policy, an e-government policy and information technology procurement guidelines (DPSA 2009b). In addition, the Council assists in monitoring information technology projects in government so as to prevent duplication and to facilitate the development of a single access window to government services for citizens (DPSA 2009b). Whether or not the GITOC is functioning as efficiently as expected, this is another example of the institutionalisation of information technology in the South African public service. Apart from the Government Information Technology Officer's Council, in 2001 the Department of Public Service and Administration drafted an e-government policy. The strategy builds on a previous draft strategy

from the Presidential National Commission in 2004, which, in its turn, built on a GITOC strategy developed in 2003 (DPSA 2009b).

An important e-government initiative that the Department of Public Service and Administration has undertaken is the development of the South Africa Government Online gateway. This gateway, which was initiated in 2002, is a single electronic gateway that facilitates access to all information about and services provided by the government. Access to public services is the most important aspect of the gateway. Habtemichael and Cloete (2009:79) state that the gateway offers visitors two main options, the first being an information portal and the second a services portal. Together, these portals provide comprehensive governmental information, including information about public sector projects and tenders (Habtemichael & Cloete 2009:79). Since its inception the initiative has increased the amount of government information that is available to the public (DPSA 2009b).

After the inception of the South African Government Online gateway, other e-government projects were initiated throughout South Africa. For example all provinces have initiated an e-government initiative, with the Western Cape and Gauteng taking the lead, to encourage electronic communication. They have also developed their own portals (Habtemichael & Cloete 2009:78). Other e-government initiatives include the e-filing of tax, the 2010 FIFA World Cup website and the Department of Trade and Industry (DTI) Broad Based Black Economic Empowerment website (B-BBEE). This website was created in partnership with a number of non-profit organisations. Technology was also used to develop a database of black economic empowered (BEE) companies. The first phase ended in March 2003 with a database of 250 companies. The second phase added an additional 600 companies to the list, making it one of the most up-to-date lists of its kind in South Africa (DTI 2009). The website is a valuable tool, providing BEE companies with a powerful marketing platform to showcase their companies and initiatives to local and international businesses, organisations and interested persons (DTI 2009).

Apart from these initiatives, the *Public Administration Management Bill* (47 of 2008) also confirms the importance of using information technology in government by stating that a "minister must promote the use of information and communication technology in institutions to enhance the efficiency of their internal and administrative operations". This includes a provision for developing a framework to facilitate and coordinate the development and enhancement of electronic services and to create a positive environment for the use of e-government in South Africa (Public Administration Management Bill 2008:10). Although this Bill has not become an act yet, this provision in the Bill is another indication of the importance of information technology for the South African government. The Department of Science and Technology (DST) promotes the

importance of technology and has provided South Africa with an information technology roadmap. This gives an idea of the type of technology that will be seen in the future, as well as what can be expected of it over a ten-year timeframe (DST 2009). Apart from the roadmap, the Department launched the Meraka Institute in April 2005. This Institute, which includes the Centre for High Performance Computing and the South African National Research Network, is responsible for information technology research (DST 2009). The technology and research that the Institute develops are being used in a number of African countries and have linked rural areas in South Africa with information networks (DST 2009).

Apart from these initiatives, government officials also acknowledge the benefits and importance of using technology in government. In 2007, the Deputy President of South Africa stated that ICT is crucial for the future economic and social development of South Africa (Mlambo-Ngcuka 2007). She also stated that technology should be used to make a better life for all the citizens of the country. In 2008, the Minister of Public Service and Administration stated that

“... there should be no wrong door when a citizen needs to access a service, regardless of what the service is and through which government department it is offered. Information and communication technology is at the heart of this, it provides the means by which government officials are able to access data which underpins the provision of any service (ITWEB 2008)”.

This was reiterated by the new Minister of Public Service and Administration in September 2009, who stated that information technology should be used to improve the lives of citizens and that citizens should be at the heart of all technology initiatives (DPSA 2009c). Furthermore, the Department of Communications stated that, for South Africa to participate fully in the information society, information and communication technology literacy and skills at all levels of society and government were becoming increasingly important (DOC 2007; PNC 2007). This includes information technology skills for public servants, who need to be able to use technology optimally to function effectively in the public service. This section has shown that the South African government has developed various policies and plans and created several institutions to promote information technology in the public service. Whether or not these interventions are successfully implemented, they serve at least as an indication of the importance of information technology for the South African government.

INFORMATION TECHNOLOGY SKILLS REQUIRED BY PUBLIC SERVANTS

Information technology skills that are required by society and public servants at all levels have led to the Department of Communications (DOC 2007; PNC 2007) classifying information technology skills into three areas:

- information and communication technology skills needed for modern life outside the workplace, known as digital literacy or e-literacy
- information and communication skills in the workplace necessary for responding to changes in business and industry
- information and communication technology skills for specialists in the information technology industry

The skills area “information and communication skills in the workplace”, mentioned at the second bullet above, is the focal point for this article. These skills include skills for working with information systems and computers in the public service (Van Straaten 1984:72-73). Kotze (1985:52–53) states that public servants need to gather information and data in order to be able to do their jobs as professional administrative functionaries of the government. Northrop (1999:18–19) also states that public administration graduates, who will become public servants, will need hands-on skills and computer knowledge, including the ability to gather, save and retrieve data and information. Accordingly, public servants need to manage, use and understand information technology and computers to be effective and efficient in their jobs.

Holden (1999:76) states that information technology has become an important part of the public service and can therefore not be left to the domain of “computer graduates”; public servants should know how to collect, process, store and disseminate information and use technology. These can be seen as information and communication skills that are needed in the workplace so that public servants can respond to changes in business and industry or changes in the public service. According to the European Institute of Public Administration (2005:17) the use of information technology and the internet in public administration calls for the development of information technology skills to assist in bringing about change in government; hence, information technology, the internet and e-government imply a modernised way of service delivery, of sharing data and of communicating that can include for example the use of e-mail and internet skills and knowledge for improved service delivery and communication.

Apart from basic technical skills like the sourcing, storing, retrieval, dissemination and archiving of information, public servants also need an understanding of information management and the information society

(European Institute of Public Administration 2005:17). The European Institute of Public Administration furthermore states that public servants should have traditional skills, for example human resource management, organisational skills, financial management skills and policy skills, as well as new information management skills. These information management skills include a basic knowledge of computers and standard computer programs as can be seen in Table 1. More advanced information technology skills, for example software development, web design and database design, may be required, depending on the type of work the public servant does (European Institute of Public Administration 2005:17–18).

The Organisation for Economic Cooperation and Development (OECD 2002) is of the opinion that information technology skills need to be part of the knowledge and work of public servants, enabling them to integrate information and communication technology into public administration. Accordingly, they should understand how technology can be used to accomplish or improve government work and processes. Consequently, the Organisation for Economic Cooperation and Development and Northrop provide guidelines on the type of technology skills that public servants should be expected to have. Apart from the Organisation for Economic Cooperation and Development and Northrop's guidelines, Techlearning.com (2009) and EvaluTech (2009) provide a list of the information technology skills that are required by learners in the 21st century in order to be able to enter any profession, including the public service. These skills are summarised and compared with each other in Table 1.

By tabulating the views from various authors who write about technology skills for the public service Table 1 shows that authors like Northrop, the Organisation for Economic Cooperation and Development, Techlearning.com and EvaluTech include end user skills/word processing skills/information professionalism skills as important skills for a public servant to have. These skills incorporate the use of Word or WordPerfect and the ability to source, store and retrieve information to work on documents or to complete reports. This is in line with what other authors have written about technology skills for public servants; for example Holden (1999:76) states that public servants should know how to collect, process, store and disseminate information by using technology.

Other information technology skills, for example the ability to use spreadsheets/problem-solving skills, graphics/presentation skills, e-mail/communication tools and the internet, were only mentioned by Northrop, Techlearning.com and EvaluTech. These skills are still important, especially since e-mail, the internet and communication tools are used to communicate with citizens, provide information and promote the use of e-government.

Database management/information management skills are mentioned by Northrop (1999:14–15) and the Organisation for Economic Cooperation and

Table 1: Information technology skills for public servants

Information technology skills	Northrop (1999:14 –15)	Organisation for Economic Cooperation and Development (2002)	Techlearning.com (2009) and Evalutech (2009)
End user skills/ word processing skills/information professionalism skills	Word or WordPerfect is used by governments, business and citizens, a general knowledge of how to use these programs is important for working on documents.	General basic information technology skills and professionalism skills, for example the sourcing, storing, retrieval, dissemination and archiving of information.	Being able to use communication, information processing and research tools, for example word processing.
Spreadsheets/problem-solving skills	Spreadsheets are used for accounting and budgeting in government departments, and can also be used for working out formulas.		Using problem-solving tools such as spreadsheets, decision support and design tools to manage complex problems and to think critically.
Graphics/presentation skills	Pictures are easy to remember and can make a report or presentation clearer and more powerful.		Using presentation software to communicate effectively.
Data management/ Information management skills	Database management allows a public servant to keep track of everything that he/she is working on, from spreadsheets to mailing lists.	Information management skills are important to coordinate and collaborate within and outside a department to provide public services and information.	
E-mail/communication tools	E-mail helps public servants to communicate faster while saving time and money.		Being able to use communication, information processing and research tools, for example e-mail and groupware.

Table 1 continued

Information technology skills	Northrop (1999:14–15)	Organisation for Economic Cooperation and Development (2002)	Techlearning.com (2009) and Evalutech (2009)
Internet	Governments are making use of the internet to communicate with citizens and to provide services to the public, for example e-government.		Being able to use communication, information processing and research tools, for example the internet to access, manage, integrate, evaluate and communicate information.
GIS	Geographic Information Systems are used for planning and public works and assist with mapping areas.		
Information society skills		This skill includes an understanding of new technology and how technology can relate to service delivery in government.	
Acquisition skills		The ability to find, define, use and maintain information technology products and services.	
Interpersonal and self-directional skills			The ability to use personal developmental and productivity tools, for example e-learning, time management and collaboration tools, to enhance productivity and personal development.

Source: Adapted from Northrop (1999:14–15), the Organisation for Economic Cooperation and Development (2002), Techlearning.com (2009) and Evalutech (2009)

Development (2002). This skill is used to keep track of work and mailing lists and can be seen as important since public servants have many tasks to deal with. The use of GIS, information technology skills, information society skills, acquisition skills and interpersonal and self-directional skills are only mentioned by one author. Nevertheless, this does not make them less important.

Apart from the technology skills mentioned above, the Directors General Responsible for Public Administration in the European Union (2003) state that basic information technology skills for public servants are no longer relevant, as they currently need more advanced information technology skills to make proper use of document management and government databases. This is confirmed by the European Institute of Public Administration (2005:18), which states that modern working conditions require more advanced skills and technology competencies, for example the development of software, web design and database design, in fast-changing government work.

In South Africa, the Report of the Presidential Review Commission on the Reform and Transformation of the Public Service in South Africa (1998:25) states that an emergency development programme for information technology training of public servants should be initiated. According to the Department of Public Service and Administration's "Electronic Government: The Digital Future" (2001:10), the development of information technology skills in the South African government cannot be left to chance. In transforming any government so that it can make better use of information technology, the technology skills of public servants must be developed. The development of information technology skills in South Africa is confirmed by the SITA 2008 Annual Report (2009:15) which regards the shortage of information technology skills in the country as a major challenge in the public and private sectors.

The South African government is also committed to meeting the requirements of the World Summit on the Information Society Plan of Action, which was initiated in Geneva during 2003. At the Summit, world leaders from all countries met to create a shared vision, mission and action plan for the development and use of information and communication technology and to build a people-centred, inclusive and development-oriented information society. In this information society all citizens should have access to information and knowledge, as well as to education and training in this regard, in order to develop and improve their quality of life by acquiring the skills and knowledge needed to understand and participate in the information society. Technology should be used in the information society to educate, train and develop human resources (World Summit on the Information Society 2003). The Department of Science and Technology supports this view and states that the development and availability of appropriately skilled human resources is the most important resource in developing and building the country. It

concludes by stating that “skilled people are the lifeblood of the knowledge-based economy” (DST 2009). Although this statement by the Department may be only rhetoric, these statements at least serve as an indication of the government’s acknowledgement of the pivotal role information technology should play in the country’s economy and public life. It needs to be shown which institution or office-bearer will take e-government leadership to synchronise these activities.

INFORMATION TECHNOLOGY SKILLS IN THE PRIVATE SECTOR

Bearing in mind the suggestion that system and environment interact in terms of the idea of “co-emergence” (the central idea of enactivism) (Li, Clark & Winchester 2009:407), one can argue that the public service as environment interacts in the same way with other environments, such as the private sector. In fact, the reference by Li, Clark and Winchester (2009:407) to “a complex co-evolving process of systems interacting and affecting each other and their environments” is especially applicable to the interaction between the public service and the private sector with regard to the use of ICT. Information technology skills needed for responding to changes in business and industry (see the second bullet of the classification by the Department of Communications mentioned earlier) has been used for some time and with success in the private sector and has enabled them to increase productivity and competitiveness (ICT Skills Monitoring Group 2002). Borade (2010) states that the advantages of using technology in business include improving business administration, production, communication and timeliness, and streamlining business processes. The use of the internet has made many businesses more productive and has resulted in greater profitability through access to global clients. Online businesses are available 24 hours a day, seven days a week from remote locations, giving them the opportunity to communicate with clients and to receive and exchange more products, services and ideas (Borade 2010).

The effective use of technology in business has led to the use of the term “e-business” (Wikipedia 2010). E-business includes all business processes, for example the electronic purchasing of products, processing orders electronically, completing all customer services online and cooperating and communicating with all business partners electronically (Wikipedia 2010). Andam (2003) states that in e-business, information technology is used to enhance business opportunities; this includes any process that takes place within a business. According to Andam (2003) and Leonard (2010), the benefits of having an e-business include the following:

- **Easier production processes**, including easier procurement, ordering and replenishment of stocks; processing of payments; electronic communication with suppliers; and production control processes
- **More customer-focused processes**, including easier promotional and marketing efforts, selling via the internet, fast processing of customers' purchase orders and payments, and fast and easy customer support
- **Convenient internal management processes**, simplified employee services, training, easy internal information-sharing and convenient online recruiting of personnel
- **Removal of location and availability restrictions**: A business does not need a physical location. A physical location is restricted by size and limited to only those customers who can get there, while an online business has a global marketplace with more customers online than would be in line during normal working hours. The cost of maintaining an online site is less than renting a physical location.
- **Improved customer service**: customers receive more customisable and specialised service, with less time spent travelling to businesses and waiting in line. An online business is never closed and information is quickly and easily available to clients.

These are some of the advantages of having an e-business; however, as with the public service, employees in private business also need technology skills to benefit from the advantages that technology offers them. The ICT Skills Monitoring Group (2002) states that the rapid growth of information technology in business has led to an increased demand for technology skills for business. According to Kolding and Kroa (2007) the information technology skills needed for business include basic and advanced technology skills. Basic information technology skills for business include the ability to use e-mail, the use of word processing tools, for example the ability to obtain, store, retrieve and disseminate information, as well as the ability to use spreadsheets and presentation software. Advanced information technology skills for business include the use of software tools and specialised tools that support business, for example using technology to do accounting, sales or marketing online, as well as improving planning, decision-making, implementation, monitoring and evaluation.

From the above it can be seen that technology has benefited business in various ways by, for example improving customer service and providing services and products faster. The technology skills that are needed for business include some of the skills that have already been mentioned as skills that are also relevant in the public service. The ability to use word processing skills, e-mail and spreadsheets, for example, is mentioned as being important for both the public and the private sector. Such skills include the ability to obtain, store,

retrieve and disseminate information. Accordingly, it can be concluded that some technology skills (especially those skills in the workplace) are important in order for both the public and the private sector to function properly. Although the other two categories of skills in the classification system of the Department of Communication (information and communication technology skills needed for modern life outside the workplace, known as digital literacy or e-literacy and information and communication technology skills for specialists in the information technology industry) are also important in the broader sense of the Department's responsibility, they do not directly impact on workplace skills which form the focal point for this article.

CONCLUSION

As it is common knowledge that public servants are supposed to use information technology in the process of rendering services to the public, one can expect them to have the skills and knowledge (their so-called professional ways of being) necessary to understand how information technology can be used to accomplish or improve government processes and procedures. Although these ICT skills and knowledge may be part of their general environment, a specific description thereof within the context of this professional ways of being of public servants seems to be lacking in the South African Public Administration scholarly literature. This article consequently identifies those information technology skills expected to be part of a public servant's professional ways of being. While it can be regarded as common knowledge that public servants indeed need information technology skills in order to function effectively, this article makes a contribution to the South African Public Administration literature on the application of information technology by presenting a comprehensive categorisation of typical information technology skills one can expect public officials to be equipped with. By doing this, this article contextualises the need for equipping public servants for their profession as public servants within the theory of professional ways of being and enactivism. This article not only provided examples of how ICT forms part of a public official's professional environment in the way it is currently being used by the South African government for initiatives including e-government: it also demonstrates how ICT forms part of the macro environment including the private sector.

This article shows that the professional environment of a public servant requires some basic ICT skills. For example the ability to use word processing programs, e-mail and the internet, and the ability to obtain, store, retrieve and disseminate information, as well as the ability to use spreadsheets, are

important skills for any public servant. Other more advanced ICT skills, such as Geographic Information Systems, database design and management and web design, may be necessary in specific circumstances. It has been shown that basic ICT skills are no longer enough and that public servants will have to be equipped with more advanced ICT skills to function effectively in the public service. Bearing in mind that ICT knowledge and skills are regarded as one of a public servant's professional ways of being, and that public servants need to learn their professional ways of being through professional academic education programmes, this article recommends that further research be done on how ICT knowledge and skills can be facilitated through the current academic programmes offered to educate public servants.

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