

# Information technology governance process maturity in Higher Education Institutions in South Africa

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## **Abstract**

The Department of Education, South Africa (now known as the Department of Higher Education and Training or DHET), published a White Paper on the Transformation of the Higher Education (HE) Sector in 1997, to ensure that the sector would meet the criteria for the HE agenda of the country. Governance of the (HE) sector in South Africa is defined in an Act of parliament governing the sector, the Higher Education Act 101 of 1997 (DoE 1997a), as amended, and the Act defines the governance organs required. Whilst the corporate governance requirements are well defined and practised, there is no formally espoused requirement for the governance of information technology (IT). This article investigates, firstly, the issue of IT governance practices in current literature; and secondly, the maturity levels of IT governance processes in public higher education institutions (HEIs) in South Africa, using the Control Objectives in Information Technology (COBIT) 4.1 framework developed by the Information Systems Audit and Control Association (ISACA). Ten of the 23 public HEIs in South Africa participated in a survey requiring 34 responses. The results of this survey on the level of IT governance process maturity will be presented and discussed in order to better understand the factors contributing to IT governance process maturity levels in the public (HE) sector in South Africa. This will provide data leading to a better understanding on how to achieve higher levels of IT governance process maturity and the benefits that are associated with these improved levels.

**Keywords:** Information, information technology, process maturity, governance, education, COBIT

## **INTRODUCTION**

There has been increased interest in information technology (IT) in many higher education institutions (HEIs) in South Africa since 2000, driven by a move towards ‘the knowledge society’, a society for which IT is considered a basic requirement (CHE 2006, 7). In other countries, the interest in technology is related to national policy frameworks, rapidly changing IT sectors, and the impetus provided by various funding bodies (*ibid.*). This is not the case in South Africa, where the Department of Education, South Africa (now known as the Department of Higher Education and Training or DHET) has no policy that explicitly steers such practices.

Despite this, HEIs are spending more of their budgets on IT infrastructure than they did in previous years, despite poor IT infrastructure both nationally and in higher education (HE) (*ibid.*). The objective of this article is to highlight the findings of a study on IT governance in public HEIs in South Africa. More specifically, the article focuses on IT governance process maturity levels within these South African public HEIs.

IT governance process maturity is essentially the state of functionality or the efficiency of IT processes, ranging from ‘non-existent’ to ‘optimised’. The article first provides an insight into the legislation governing this sector. This is followed by a review of the relevant theoretical foundation of IT governance, after which the findings of a survey completed by the respondents on IT governance process maturity levels are presented and discussed.

## **PUBLIC HEIS IN SOUTH AFRICA DURING THE LAST DECADE**

HEIs in South Africa have evolved over the decades to become institutions that range in size from the largest distance education institution – with approximately 360 000 students – to the smallest institution – with approximately 7 000 students (CHE 2012). These institutions now exist in three categories, namely: universities, universities of technology and comprehensive universities which are a combination of the first two categories. Even before the restructuring of the public HE sector in South Africa, institutions had become more and more dependent on IT as a facilitator of knowledge creation and communication (CHE 2006).

IT is pervasive; it has become embedded in all sectors of society, including HEIs to the point where not only the administrative functions depend on IT systems, but academia itself depends more and more on the advantages provided by technology-based education systems (Mishtry, Mkhize and Harypursat 2002). This dependence on IT becomes even more imperative in South Africa’s knowledge-based economy, where organisations are using technology in managing, developing and communicating intangible assets, such as information and knowledge (Patel 2003).

The restructuring of the HE sector has also added a new dimension to this dependence, where IT is needed to provide high bandwidth connectivity and shared IT resources between newly merged institutions as well as other services highlighted by, amongst others, associations such as EDUCAUSE. EDUCAUSE is a non-profit

organisation (NGO) and the foremost community of IT leaders and professionals committed to advancing HE. Worldwide membership of EDUCAUSE includes over 1 800 colleges and universities as well as over 300 corporations serving HE, other associations, state agencies and other NGOs (EDUCAUSE 2012). The EDUCAUSE Top Ten technology issues for 2011 also indicate that the rise in the strategic importance of teaching and learning with technology has moved beyond the data centre and institutional administrative systems, and has become part of the daily life of faculty and students. The number of courses taught online and in blended technology-mediated modes continues to increase (*ibid.*). This pervasive use of technology has created a critical dependence on IT that calls for a specific focus on IT governance (Van Grembergen 2004). The Report on Corporate Governance for South Africa and the Code of Governance (hereafter King III) (IoDSA 2009) states that IT has become an integral part of conducting business today, as it is fundamental to the support, sustainability and growth of organisations. All registered business entities in South Africa, including HEIs, must apply the code, or else explain their non-application thereof (IoDSA 2009).

Weill and Ross (2004) state that as IT has become more important and pervasive, senior management teams are increasingly challenged to manage and control IT, in order to ensure that value is created. To address this issue, many enterprises are creating or refining IT governance structures to better focus their IT spending on strategic priorities. McLure (2003) states that a number of variables, in combination and usually institutionally specific, now have a significant impact on what constitutes good governance and decision-making, including: general institutional characteristics; sources and levels of funding; leadership style; formality of planning; organisational culture; decision-making style; and type of IT leadership structure. These are all issues that need careful consideration.

It is generally understood that collegiality in the public HE sector in South Africa also plays a role in the ability to implement governance structures. Whilst academic endeavour aims to explore the widest range of issues specific to an area of interest or research and, thereby, to provide the optimal solution, management endeavour aims to implement technology or services as quickly and efficiently as possible, and then to measure their efficiency. The Organization for Economic Co-operation and Development (OECD 2000) provides its view on this matter by stating that 'the concept and emphasis of university research, and the disciplinary basis of traditional university structures, are in conflict with the instrumental, market-based, and bottom line oriented approach to knowledge in the industry'. This has perhaps not always been the case in terms of IT governance as when IT was perceived as simply 'plumbing' for the enterprise, it was simple to determine the extent of the IT governance requirements without consultation, particularly with the academic fraternity. As the scope of IT has grown to meet the ever-changing challenges facing business, so too have the awareness, understanding, capability, and expectations of non-technical business leaders (Laplante and Costello 2006). IT is no longer merely a supporting tool for business, but a fundamental component of company strategy

in such roles as operations, internal audit, compliance and decision support (Van Grembergen 2004).

The Green Paper for Post-School Education and Training published by the DHET in January 2012 indicates plans for further transformation of the HE sector in South Africa. Here, also, it is stated that IT is increasingly becoming a critical ingredient for participation in a globalised world, as well as being an indispensable infrastructural component for effective education provision, especially in the post-schooling sector (DHET 2012). From the abovementioned facts it is clear that the role of IT has evolved and has become a critical component of institutional strategy. As a result of this integration of IT into institutional strategy, it has become increasingly important to ensure that all aspects of IT governance are investigated, and for the purpose of the current study this investigation begins in the next section.

## **LITERATURE REVIEW**

The literature review covers aspects of corporate governance and IT governance where relevant to the public HE sector in South Africa. Aspects of IT governance are reviewed against the Control Objectives in Information Technology (COBIT) 4.1 best practice IT governance framework. IT governance requires that the scarce technology resource capacity be diligently distributed across an organisation for overall business success. In other words, it stipulates that IT cannot be allocated merely on the basis of individual team needs, but rather on collective, organisational goals (O'Reilly Radar 2011). Within the public HE sector in South Africa, there is no requirement to ensure any collective objectivity towards IT governance, and it is within this context that the origins of corporate governance and the relatively newer concept of IT governance are explained.

### **Corporate and IT governance**

The broader topic of corporate governance will not be reviewed in depth in the current article; suffice it to say that IT governance is a function of corporate governance (IoDSA 2009). IT governance is essentially all about the board directives, policies and procedures that determine how an organisation will direct and control the use of its technology resources, so that these resources may successfully facilitate the realisation of the organisation's business goals (De Haes and Van Grembergen 2004).

Flowerday and Von Solms (2005) assert that the majority of companies today are totally dependent on their information assets, in most cases stored, processed and communicated within information systems in digital format. These systems are facilitated by modern information and communication technologies (ICT).

The governance structures required in public HEIs are defined in the Higher Education Act 101 of 1997 (hereafter the HE Act; DoE 1997a). The Act prescribes both the membership and the method of constituting the governance organs. A new 'co-operative governance model', as defined by Cloete and Kulati (2003, 4–5) shows a shift of the locus of power from 'centralized control' to 'steering, in which

governments provide the broad regulatory framework; and, through the use of instruments, such as planning and funding, these institutions are ‘steered’ to produce the outputs that governments desire.

Steering is seen as an interactive process between government and institutions. Co-operative governance requires that decision-making processes at the systemic, institutional and departmental levels are transparent, and that those taking and implementing decisions are accountable for the manner in which they perform their duties and use resource. (Doe 1997a, 13).

This model of co-operative governance encourages institutional autonomy within the framework of the Act, but the governance report (annual report), as required by Reporting Regulation R691 (DoE 2007) promulgated in terms of the HE Act, is required six months after the year end. This does not contribute to effective control.

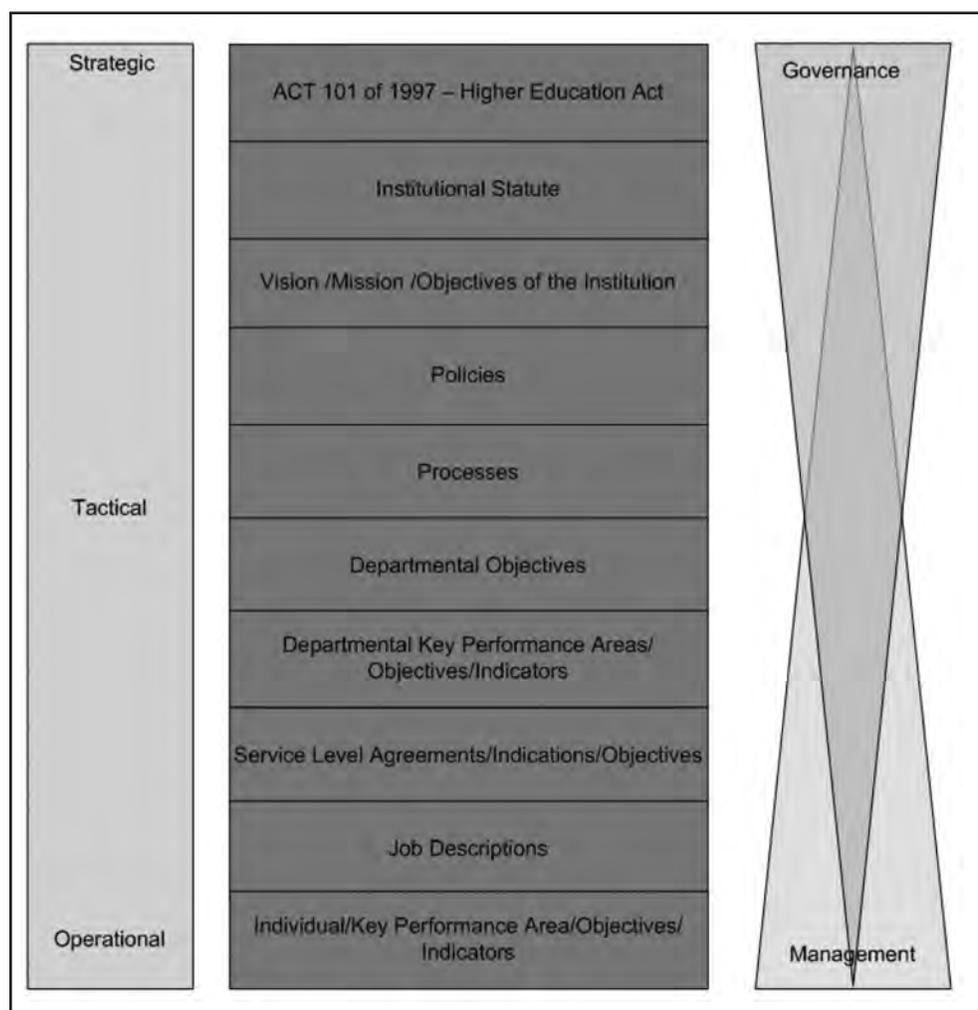


Figure 1: The context of governance and management in higher education in South Africa

The HE Act is the core regulatory influence on sound governance practices in the HE sector in South Africa. The HE Act (DoE 1997a) aims to: 'Regulate higher education; to provide for the establishment, composition and functions of a Council on Higher Education; to provide for the establishment, governance and funding of public higher education institutions; ...' The preamble to the HE Act (*ibid.*) envisages that a 'single co-ordinated HE system, which promotes co-operative governance and provides for programme-based higher education' is established.

The governance structures required, as well as their composition, are defined (*ibid.*, 2). The upper levels of the diagram in Figure 1 indicate the areas of maximum focus on governance and lesser focus on management. At the strategic level, the institution's strategies are defined and policies devised that will promote successful management function. At the tactical level, policies are transformed into processes that will be used to execute the tasks required, in order to function as an organisation.

Service-level agreements play a key role in ensuring that service objectives are measured and met. The level of steering or governance decreases as the functions move from the strategic level, through the tactical level to the functional-management level. The intensity of the role of management also decreases with movement from the functional role of management upwards to the strategic or governance level. Functions at the operational level are performed within the framework provided by policy through governance structures, which in many cases, are guided by standards.

## **IT GOVERNANCE THEORETICAL FOUNDATION**

As corporate IT infrastructure increased in size and complexity from the early 1960s, corporations recognised the need for better mechanisms for assessing IT's role and alignment to key corporate initiatives (IBM 2011). The role that IT played in organisations evolved from a purely supportive role (usually in the financial, human resources and sales areas) to becoming a strategic enabler. This was often done through the implementation of new technologies that could provide strategic advantage. This change of focus of IT led to the adoption of best practices and what began as a series of best practices evolved over a period of time into the field known as IT governance (*ibid.*). There are many IT governance frameworks that have been defined and used to assist enterprises in the assurance of value in their IT investments. Most of the existing frameworks are complementary, with strengths in different areas and so a hybrid approach is often taken (Symons 2005). The International Standards Organization (ISO) published an IT governance standard ISO 38500:2008 E, in June 2008. This standard was developed from the Australian Standard AS 38500. The Information Systems Audit and Control Association (ISACA) developed an IT governance framework called COBIT. The IT Governance Institute (ITGI) was established in 1998 in recognition of the increasing criticality of IT to enterprise success. The ITGI conducts research on global practices and perceptions of governance of IT for the business community. The ITGI aims to help enterprise leaders understand how effective governance can make IT successful in

supporting the enterprise's mission and goals. The COBIT framework maps fully with the six areas of the ISO 38500:2008 E, which are: Responsibility, Strategy, Acquisition, Performance, Conformance and Human Behaviour. COBIT 4.1 (2003) has been used in the current study as it commenced prior to the release of COBIT 5 in 2012 and most of the public HEIs in South Africa have some knowledge of the framework or have implemented it, to some extent, as the framework of choice within their institutions.

The process focus of COBIT 4.1 is illustrated by a process model that subdivides IT into four domains and 34 processes in line with the responsibility areas of plan, build, run and monitor, providing an end-to-end view of IT (ITGI 2011). These are shown in the Figure 2.

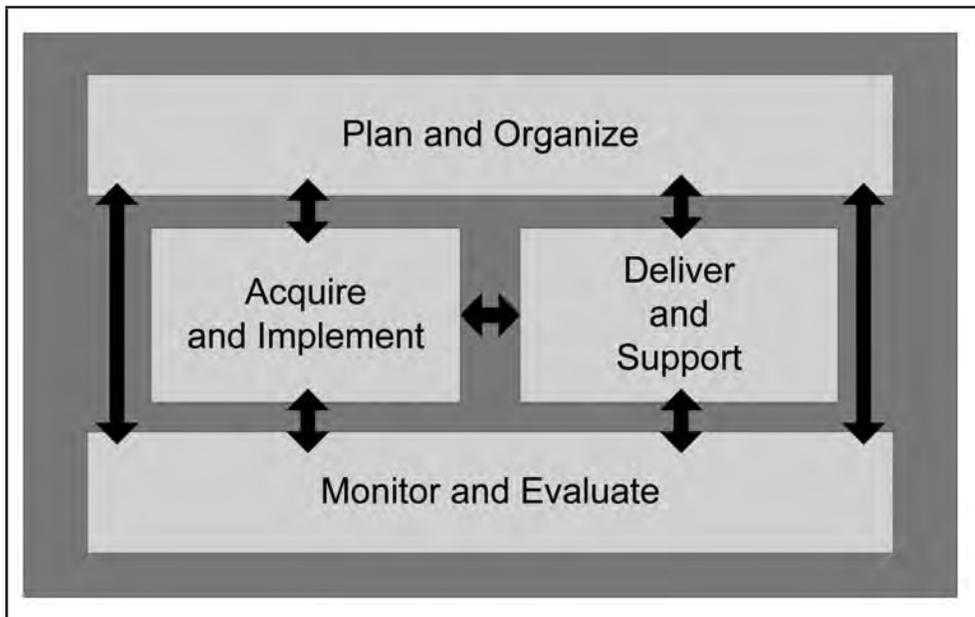


Figure 2: The four interrelated domains of COBIT IT governance framework

This end-to-end view of IT reveals the dependencies, reliability requirements and possible investment costs of IT. Investment costs are significant and much effort has gone into defining a way in which to express this as a standard financial indicator, such as return on investment (ROI). Ataya (2003) states that, initially, most organisations' decision-making related to IT relies on some form of ROI, or on the derived internal rate of return (IRR) measures to evaluate projects. Using only ROI analysis in HE can be problematic; a more coherent approach involves analysis of the value of investment (VOI), which takes into account qualitative benefits derived from IT (EDUCAUSE 2003). Qualitative benefits, such as risk reduction, improved resource utilisation and improved business/IT alignment, are benefits that can be enhanced through the application of an IT governance framework, such as COBIT in the HE

sector. The restructuring of the HE sector in South Africa over the last decade has highlighted the need to improve IT governance to ensure that the qualitative benefits that are created by the new structures, can be achieved. The EDUCAUSE (2011) Top Ten technology issues also indicate that the rise in the strategic importance of teaching and learning with technology has moved beyond the data centre and institutional administrative systems, and become part of the daily life of faculty and students. Academics were faced with increasing demand to provide access to on-line learning material and this led to the number of courses taught online and in blended technology-mediated modes to increase (EDUCAUSE 2011). This pervasive use of technology has created a critical dependence on IT that calls for a specific focus on IT governance (Van Grembergen 2004).

The application of an IT governance framework such as COBIT 4.1 is similar both in corporations and in the HE sector. Corporations refer to business/IT alignment where the typical terminology used in the HE sector in South Africa is institutional/IT alignment where institutional refers to the core functions in the sector being teaching and learning, research and community engagement. A more generic term used in later iterations of the COBIT framework is that of enterprise/IT alignment.

## **GOVERNANCE, IN THE COBIT FRAMEWORK, IS DEFINED AS**

the set of responsibilities and practices exercised by senior management of the enterprise designed to establish and communicate strategic direction, ensure the realization of goals and objectives, mitigate risk, and verify that assigned resources are used in an effective and efficient manner (ITGI 2003, 6).

De Haes and van Grembergen (2005) propose IT governance as the organisational capacity exercised by the board, executive and IT management, to control the formulation of IT strategy and to ensure the fusion of business and IT, where the primary focus is on the responsibility of the board and the executive management.

A very close relationship between enterprise and IT goals has become apparent from the above. The tight linkage between IT and organisational processes means that the IT function cannot bear sole or even primary responsibility for the effective use of information and IT. Leaders throughout an organisation must develop this competency, which is that 'effective IT governance is the single most important predictor of the value an organization generates from IT' (Ross and Weill 2004, 3).

## **IT governance in public HEIs**

Governance requirements in public HEIs in South Africa are currently guided by the legislative frameworks applicable to the sector. These include the HE Act (DoE 1997a) and the Institutional Statute. A standard institutional statute (DoE 2002) is published in terms of the HE Act, but this statute can be enhanced to provide for institutional requirements as well.

The investment in technologies needed to provide HE with the required advantage is substantial; and yet, there is no guideline or best practice requirement in place to require any form of governance of IT in the public HE sector in South Africa.

As IT becomes more critical for enterprise survival, in addition to enabling growth, IT strategy committees need to broaden their scope. Not only should they offer advice on strategy when assisting the board in its IT governance responsibilities, but they should also focus on IT value, risks and performance (ITGI 2003). Most public HEIs in South Africa have some form of IT governance or IT strategic committee in place.

IT governance is a part of corporate governance with as much requirement for consideration in a tertiary environment as in other enterprises and, as such, it is prudent to consider the reasons for IT governance in the public HE sector in South Africa.

### **Reasons for IT governance in the HE sector in South Africa**

The DHET does not specifically require HE institutions to implement IT governance practices according to the HE Act, but on the other hand, King III is applicable to all registered entities in South Africa and, therefore, also applicable to public HEIs.

The Standard Institutional Statute provides for Governance Committees required in terms of the HE Act (DoE 2002). There is no specific requirement for an IT focused committee of any nature to be established, although committees other than those specified, and as required by the university's council, may be set up.

There are, however, compelling reasons, other than legal compliance requirements, to apply good IT governance practices wherever IT is used. Posthumus and Von Solms (2005) make the point that almost every aspect of conducting business involves the utilisation of IT systems; and that these systems will present both risks and opportunities. Both the risks and opportunities need to be monitored and, therefore, the implementation of an IT oversight committee appears to be a practical mechanism for providing the necessary skills and insight to support technology based decision making and addressing strategic IT-related issues (ibid.).

IT supports every phase of HE's mission. On many campuses, there is a growing concern that the setting of priorities for new IT systems, collaborating across departmental boundaries and sharing expensive infrastructure, is not being done. While this may be enjoying varying levels of priority within some HEIs, it has not enjoyed priority status between institutions. 'One path towards improving the current situation is to improve the IT governance processes' (EDUCAUSE 2006, 10). The lack of any formally implemented best practice IT governance structure leads to increased risk, mal-alignment of enterprise processes with IT, resource inefficiencies and poor value delivery. The implementation of an IT governance framework, such as the COBIT framework, can assist in providing a structured and well informed response to this need to create value (ITGI 2003).

'Information systems were used as enablers to business, but have now become pervasive, in the sense that they are built into the strategy of the business. The

pervasiveness of IT in business today mandates the governance of IT, as a corporate imperative' (IoDSA 2009). The current level of IT governance process maturity in the South African public HE sector is unknown; and by ascertaining it, it may assist further in the understanding of IT governance and IT governance process maturity and how this can contribute to value creation. If the IT governance process maturity level turns out to be low, this can assist in the motivation for and definition of some guidelines or frameworks to assist in improving the level.

The maturity level of IT in an organisation provides a way to predict future IT and resultant organisational performance. It, therefore, becomes imperative that the governance implementation process be measured and evaluated (De Haes 2008). An on-line survey was conducted to acquire the IT governance process maturity levels of a sample section of the public HE sector in South Africa and the findings are presented after the next section.

## **METHODOLOGY**

For the current study all 23 public HEIs in South Africa were invited to participate in the research process. This included institutions across the range of university types, such as universities of technology, traditional universities and comprehensive universities.

### **The COBIT 4.1 survey methodology**

An on-line survey, using the COBIT framework, already in use at some level in most public HEIs in South Africa, was conducted. The objective was to acquire data from the most senior IT person at the institution to ensure that the responses were all submitted by persons operating at a similar strategic level in the institution and functioning in both governance and management roles. The survey collected data on the COBIT 4.1 process maturity levels. The survey was set up using the range of levels of process maturity provided for in the COBIT framework and enumerated below to ensure that, guided by the survey introduction and requirements for completion, the responses would be consistent with institutional circumstances and that they would be similar if responded to again under similar circumstances. The survey was conducted on-line using the commercial Survey Monkey toolset. The 34 primary processes cover all four domains of the COBIT 4.1 framework; and this method of assessing IT governance maturity has been well refined by international contributors during its lifetime by the ITGI (2003). The levels of process maturity in the COBIT 4.1 IT governance framework range from: non-existent (0), initial/ad hoc (1), repeatable but intuitive (2), defined (3), managed and measurable (4), to optimised (5). The respondents were required to select one maturity option in a column from each line that listed the 34 primary processes in order to be able to complete and submit the survey.

## **SURVEY RESULTS AND DISCUSSION**

It was important to make use of a globally recognised framework that was known to the survey participants and that covered the full scope of IT governance process maturity. This was necessary in order to assess the maturity level of IT governance processes, and to be able to create a shared understanding of IT and its purpose and impact on institutions, and also to increase the oversight and accountability for IT. The COBIT 4.1 framework also aligns fully with the ISO's IT governance standard, ISO 38500: 2008.

### **Results of the COBIT 4.1 survey**

The results are presented by COBIT 4.1 IT governance process maturity level, showing the average process maturity level of the institutions grouped by COBIT process domain in figures 3 to 6 below. The results of the study indicated that the overall level of IT governance process maturity averages around 1.8, meaning that the processes are at the COBIT defined level of being 'intuitive but repeatable'. The optimal IT governance process maturity level of 5 as defined in the COBIT 4.1 framework is also shown on the graph to indicate that the current levels of IT governance process maturity are not optimal.

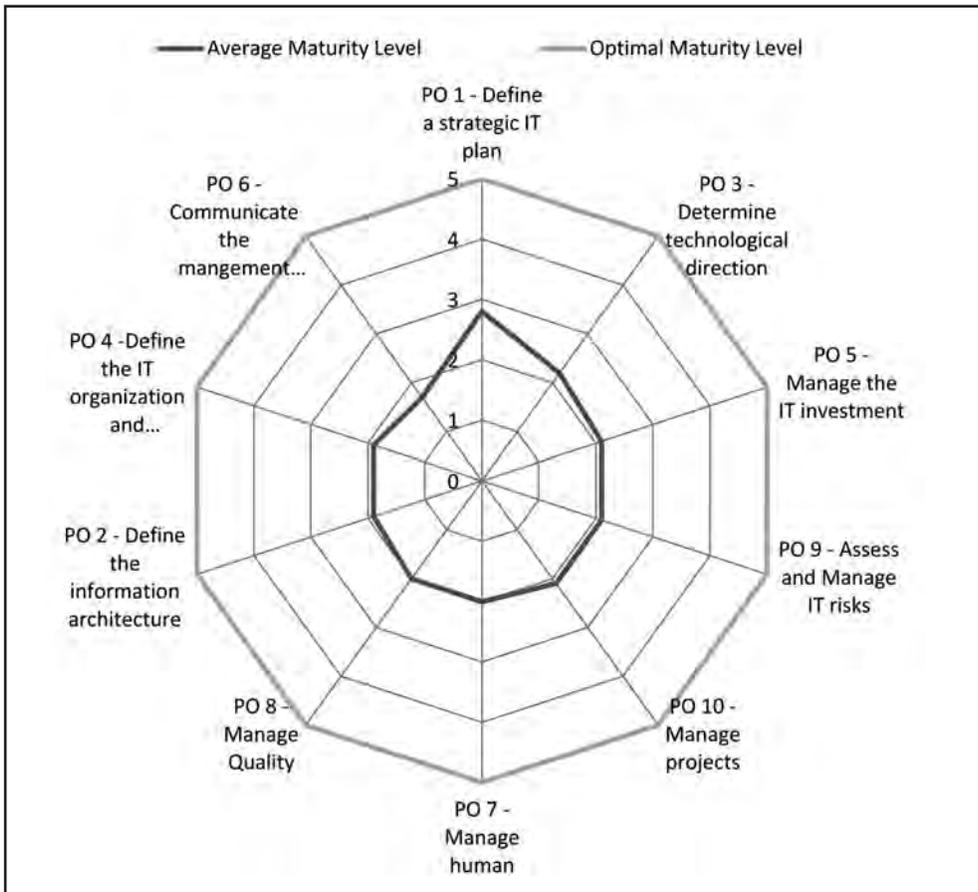


Figure 3: COBIT 4.1 IT governance process maturity levels in the 'Planning and Organising' domain

The processes whose survey result indicators shown in Figure 3 are reported at the higher levels include those that have some form of compliance requirements in terms of the HE Act, or other legislation or regulations applicable to public HEIs in South Africa. For example, process P01 – 'Define a Strategic IT Plan', process P05 – 'Manage the IT Investment' and process P09 – 'Assess and Manage IT Risk' are among those processes associated with audit requirements.

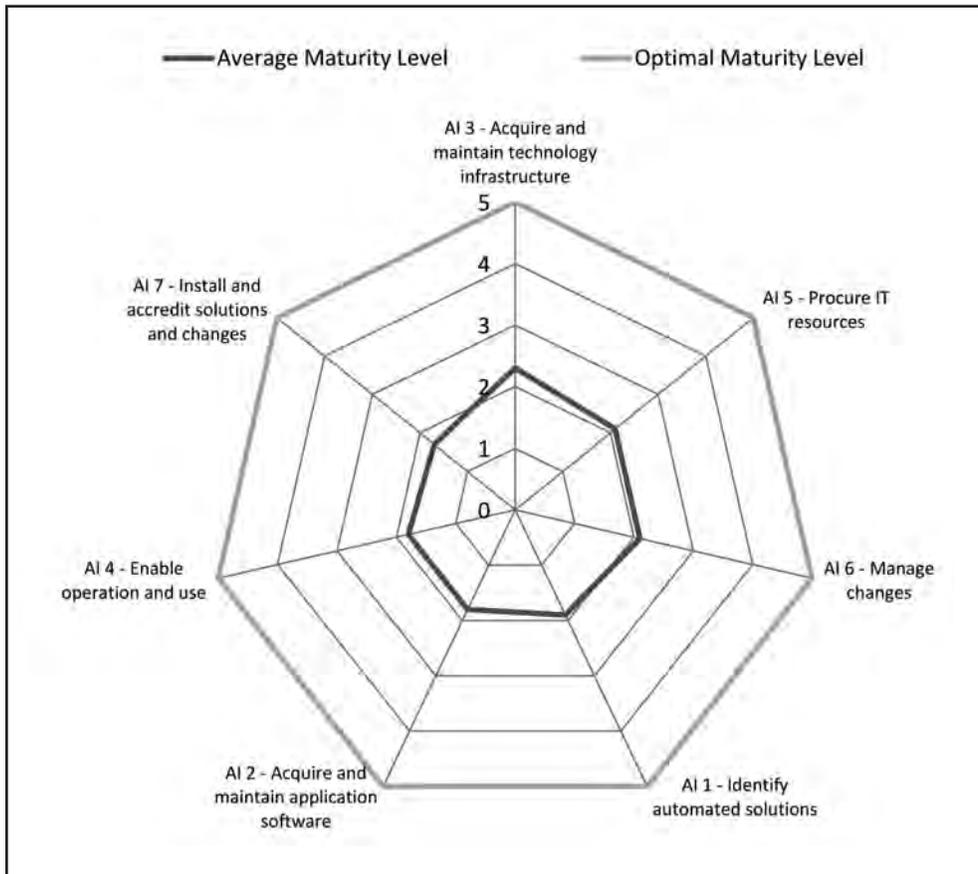


Figure 4: COBIT 4.1 IT governance process maturity levels in the 'Acquisition and Implementation' domain

Process AI3 – 'Acquire and Maintain Technology Infrastructure', process AI5 – 'Procure IT Resources' and process AI2 – 'Acquire and Maintain Application Software' in Figure 4 are reported in the survey results with the highest levels in the 'Acquisition and Implementation' domain. This function is also directly linked to other processes that are associated with audit requirements and the processes in this domain are also highly visible in the daily life of faculty and students in public HEIs in South Africa.

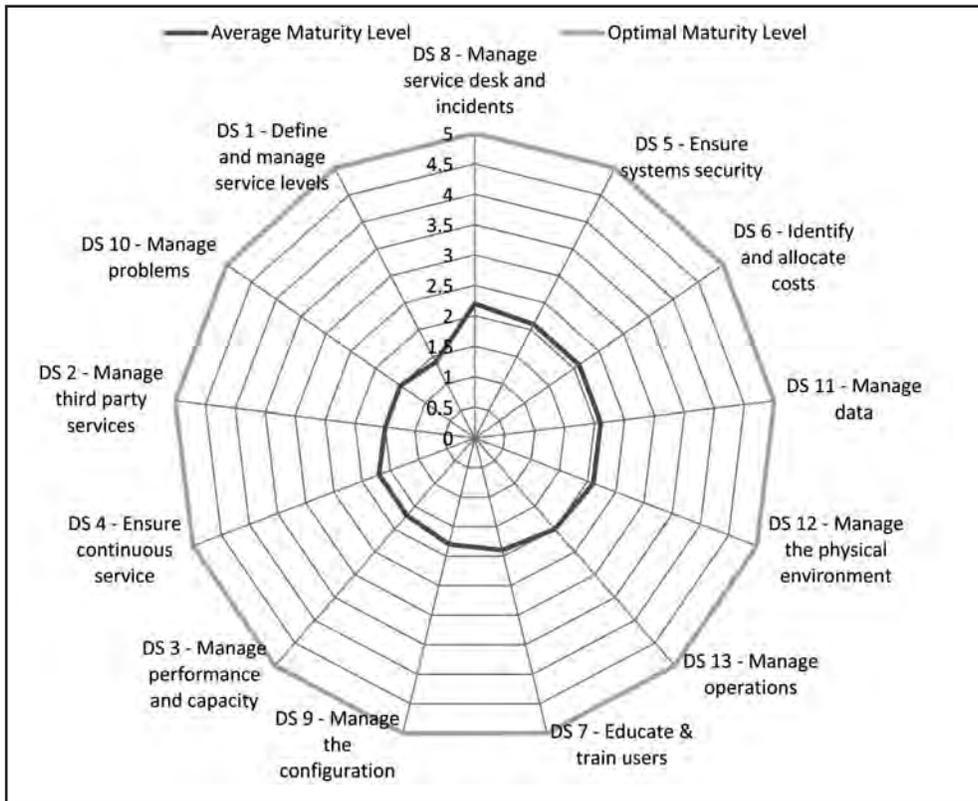


Figure 5: COBIT 4.1 IT governance process maturity levels in the 'Delivery and Support' domain

Possibly the most visible process in the 'Delivery and Support' domain shown in Figure 5 above is process DS8 – 'Manage Service Desk and Incidents'. A contributing factor to this being the highest average level of maturity reported in this COBIT domain, is that this process forms the core of the interface between IT and the enterprise and if this process maturity level is low it can result in serious consequences. Process DS5 – 'Ensure Systems Security' is reported with the second highest level of process maturity in this domain. The maturity level of this process is not only driven by policy in terms of governance requirements but also by the need for system security. The consequences of poor governance in this area can easily lead to security failure and the leakage of institutional intellectual property and other personal data.

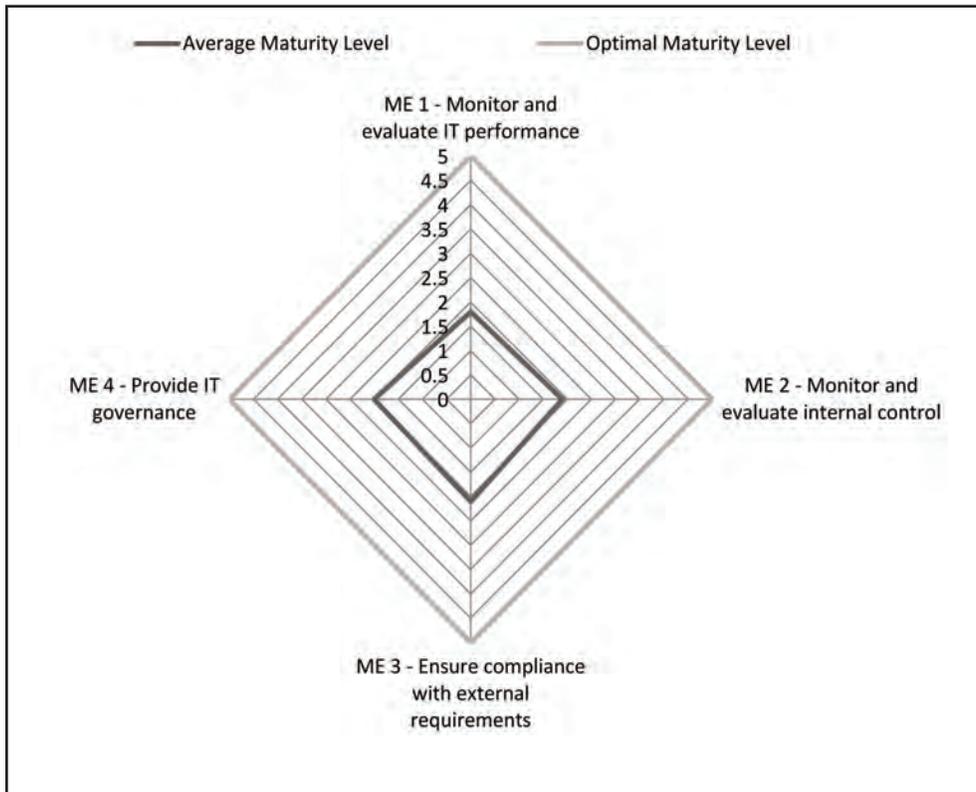


Figure 6: COBIT 4.1 IT governance process maturity levels in the 'Monitoring and Evaluation' domain

All of the processes enumerated in the 'Monitoring and Evaluation' domain shown in Figure 6 are fundamental to the functioning of any enterprise. Drucker (2004) states that 'what gets measured, gets managed'. He elaborated on this by saying: 'All managers should have the information they need to measure their own performance and they should receive it soon enough to make any changes necessary ...'. All four average process maturity level measures in this domain are low, even in comparison to the averages in the other three domains. This indicates that measurement and management of data is not being taken seriously and in Drucker's (ibid.) view means that effective management cannot take place in the absence of measurement.

The data collected and presented in the article indicate that the *average* level of IT governance process maturity in the public HE sector in South Africa, measured by using the COBIT 4.1 governance framework, is extremely low. An IT governance process maturity level of 3 indicates that IT processes have matured to the point of being properly defined and becoming systemic. Levels of IT governance process maturity below 3 indicate that there is only a limited structure to IT processes; and that this will increase risk across all areas of the business.

It can be debated that HEIs in South Africa have not focused on IT governance

in as dedicated a manner as they have focused on financial and human resource governance matters. One of the reasons could be the nascent nature of IT which has only surfaced out of the data-processing environment since the early 1980s. Another reason is that the finances of institutions need to be audited, according to legislation and that human resource matters are also regulated by legislation. Olivier, Von Solms and Cowley (2006) state that when the importance of financial information integrity is compared to business information integrity, it is clear that they are equally important and are now totally integrated. This, however, does not seem to require similar levels of IT governance and financial governance being applied yet in the public HE sector in South Africa. King III (IoDSA 2009) does suggest that an IT governance framework be adopted, but this requirement is moderated by the choice that the code allows. IT matters are, therefore, not regulated by legislation in the same manner that financial and human resource matters are regulated; this leaves the implementation of IT governance frameworks and practices to *choice*. The low levels of IT governance process maturity evident from the survey results indicate that IT governance needs to be formally addressed and improved. The highest levels of IT governance process maturity levels of South African public HEIs returned by respondents to the survey using the COBIT framework indicate that IT processes are at best at the stage of being 'repeatable but intuitive'. At worst, and most commonly, such processes are non-existent or initial/ad-hoc. IT systems in the public HE sector in South Africa not only process, store and communicate the entire institution's financial and business systems, they are also used extensively for teaching, learning and research.

## **CONCLUSION**

A high level of IT governance process maturity is normally an indicator that IT is aligned with the business or the enterprise; that it delivers value; that its performance is measured; that its resources are properly allocated; and that its risks are mitigated (ITGI 2003). Processes defined in the four domains of the COBIT 4.1 IT governance framework cover the majority of IT governance process requirements of any business or enterprise. The increasing dependence on IT, the increased cost, and the need to mitigate the risk associated with IT systems are but three reasons that make the formalisation of IT governance essential in the HE sector. From the current study, it may thus be concluded that the current levels of IT governance process maturity do not relate to the critical nature that IT serves in the HE sector in South Africa. It also indicates that there are disparate levels of IT governance applied to IT and financial disciplines within the public HE sector in South Africa.

EDUCAUSE has focused on IT governance for many years; it advocates the use of governance frameworks to improve IT governance process maturity. King III (IoDSA 2009) now also requires IT governance to be included in corporate governance practices.

It is essential that interventions address the specific issues associated with the

HE sector, in order to ensure that IT governance is improved across the sector in South Africa. It is evident from the survey results presented in the current article that the processes associated with some legislative, regulatory or reporting requirements are at higher levels than those with no obvious link. Van Grembergen (2004) states that high levels of IT governance can be achieved by acknowledging IT governance as part of corporate governance, and by setting up an IT governance framework and its corresponding best practices. It is, therefore, logical to conclude that an IT governance framework needs to be introduced consistently across the public HE sector in order to improve the levels of IT governance so as to contribute towards the achievement of the institutional objectives dependent on these IT processes.

## REFERENCES

- Ataya, G. 2003. Risk-aware decision making for new IT investments. *Information Systems Control Association Journal* 2: 12–14.
- Cloete, N. and T. Kulati. 2003. *Managerialism within a framework of cooperative governance*. Pretoria: Centre for Higher Education Transformation.
- Council for Higher Education. 2006. ICTs and the South African higher education landscape. Available at: [http://www.che.ac.za/documents/d000127/ICTs\\_HE\\_Landscape\\_Jul2006.pdf](http://www.che.ac.za/documents/d000127/ICTs_HE_Landscape_Jul2006.pdf) (accessed 11 June 2011).
- De Haes, S. 2008. *Implementing information technology governance: Models, practices and cases*. London: IGI.
- De Haes, S. and W. van Grembergen. 2004. IT governance and its mechanisms. *Information Systems Control Association Journal* 1.
- Department of Education. 1997a. Higher Education Act 101 of 1997. *Government Gazette 18515*. Pretoria: Government Printer.
- \_\_\_\_\_. 1997b. White Paper on the Transformation of the Higher Education Sector. Available at: <http://www.info.gov.za/whitepapers/1997/education3.htm> (accessed 12 February 2011).
- \_\_\_\_\_. 2002. Standard Institutional Statute. *Government Gazette 23065*. Pretoria: Government Printer.
- \_\_\_\_\_. 2007. Regulations for Annual Reporting by Public Higher Education Institutions. *Government Gazette 30132, Regulation R 691*. Pretoria: Government Printer.
- Department of Higher Education and Training. 2012. Green Paper for Post-School Education and Training. Available at: <http://www.info.gov.za/view/DownloadFileAction?id=157779> (accessed 30 January 2012). DHET see Department of Higher Education and Training.
- DoE see Department of Education.
- Drucker, P. F. 2004. *Management: Tasks, responsibilities, practices*. Oxford: Butterworth-Heinemann.
- EDUCAUSE. 2003. Funding information technology. Available at: <http://www.educause.edu/ir/library/pdf/pub4002.pdf> (accessed 4 August 2010).
- \_\_\_\_\_. 2006. *Improving IT governance in higher education*. Berkeley, CA: EDUCAUSE, Centre for Applied Research.
- \_\_\_\_\_. 2011. Top ten IT Issues, 2011. *EDUCAUSE Review* 46(3): 1–7.

- . 2012. Available at: <http://www.educause.edu/> (accessed 17 November 2011).
- Flowerday, S. and R. von Solms. 2005. Real-time information integrity=system integrity+data integrity+continuous assurances. *Computers and Security* 24(8): 604–613.
- IBM. 2011. *A business risk approach to IT governance*. White Paper. New York, NY: IBM.
- Institute of Directors in Southern Africa. 2009. Report on corporate governance for South Africa and the Code of Governance (King III). Johannesburg: IoDSA.
- IoDSA *see* Institute of Directors in Southern Africa.
- IT Governance Institute. 2003. Board briefing on IT governance. 2nd edition. Available at: <http://www.itgi.org> (accessed 11 January 2010).
- . 2011. Available at: [http://www.isaca.org/Knowledge-Center/cobit/Documents/CobIT\\_4.1.pdf](http://www.isaca.org/Knowledge-Center/cobit/Documents/CobIT_4.1.pdf) (accessed 29 October 2011).
- ITGI *see* IT Governance Institute.
- Laplante, P. and T. Costello. 2006. *CIO Wisdom II: More best practices*. Upper Saddle River, NJ: Pearson Education.
- Laurillard, D. 2002. Rethinking teaching for the knowledge society. *EDUCAUSE Review* JANUARY/FEBRUARY: 16–25.
- McLure, P.A. 2003. *Educause leadership strategies: Organising and managing information resources on your campus*. San Francisco, CA: John Wiley & Sons.
- Misthry, N., P. Mkhize and R. Harypursat. 2002. The role of information technology and its impact on tertiary education. *Conference for Information Technology in Tertiary Education (CITTE)*. Durban: Association of South African University Directors of Information Technology, 8.
- OECD *see* Organization for Economic Co-operation and Development.
- Olivier, C., R. von Solms and L. Cowley. 2006. Information integrity assurance for networks: Let's learn from the financial model. *Computer Fraud and Security* 8: 7–14.
- O'Reilly Radar. 2011. Available at: <http://radar.oreilly.com/2011/01/why-is-it-governance-so-diffic.html> (accessed 20 December 2011).
- Organization for Economic Co-operation and Development. 2000. *Knowledge management in the learning society*. Paris: OECD.
- Patel, N. V. 2003. An emerging strategy for e-business IT governance. In *Strategies for information technology governance*, ed. W. van Grembergen, 81–97. Hershey, PA: Idea Group.
- Posthumus, S. and R. von Solms. 2005. IT oversight: An important function of corporate governance. *Computer Fraud & Security* 6: 11–17.
- Ross, J. W. and P. Weill. 2004. *IT governance: How top performers manage IT decision rights for superior results*. Boston, MA: Harvard Business School.
- Symons, C. 2005. *IT governance framework*. Cambridge, MA: Forrester Research.
- Van Grembergen, W. 2004. *Strategies for information technology governance*. London: Idea Group.
- Van Grembergen, W. and S. de Haes. 2005. Measuring and improving IT governance through the balanced scorecard. *Information Systems Control Journal* 2.