A Structured Methodology for Developing IT Strategy

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ABSTRACT

This paper presents a practical case study of a methodology for the systematic creation of an IT strategy, as developed at the University of Pretoria, a large South African research university. The methodology is pragmatic rather than academic and was developed for implementation in a university environment.

The resulting strategy takes into account strategic alignment, business drivers and external influences. The current IT organisation and infrastructure is assessed and contextualised. IT risks, as aligned with the corporate risk management process, are identified, as are current and planned IT projects. The key results of the application of the methodology are a set of aligned and interlinked documents describing the IT strategy, enterprise architecture, IT governance and information technology planning.

Key words

Information Technology Strategy, IT Strategy, Enterprise Architecture, IT Governance, Information Technology Planning.

INTRODUCTION

The methodology for developing IT strategy was derived in a specific context, and aimed at addressing the practical need to establish a working set of IT strategy documents at a large South African research university. The resulting strategy aims to guide IT governance, enterprise architecture and the targeted application of IT resources. Neither the methodology nor the resulting strategy attempts to be comprehensive or academic in any sense, but illustrates what was possible and practical at a specific institution with a specific culture, style of management and a sufficient level of IT organisational acceptance.

As a result of the experience gained, the author considers the methodology suitable for implementation in a large research university with, preferably, a formal strategic plan in place. A prerequisite for any credible, and practically executable, IT strategy at a university would be an institutional IT organisation with a sufficient degree of acceptance and credibility with the Executive, Deans and Directors of Support Services. The IT organisation needs to be sufficiently mature to be in a position to release sufficient management resources from operational requirements to be able to create a strategy that will not simply be filed away. The resulting documentation loses impact if it is not presented in a sufficiently straightforward and non-technical way.

The aim is to produce a straightforward and implement able strategy, aligned with institutional priorities, which is suitable as a starting point for demonstrating IT business value and will justify IT resource and budget allocations.

The information technology strategy which resulted from application of the methodology in this case study, is structured according to a framework that was developed for this purpose. The framework ensures strategic alignment and provides key supporting and output documents. The main driver for the information technology strategy is the University of Pretoria's published strategy document, which is currently under review[1]. This input is combined with a scan of emerging technologies and user requirements to guide the IT strategy. The overall strategy document is supported by three main pillars:

- An enterprise architecture
- An IT governance structure
- An information technology plan.

The main strategy document describes strategic alignment, business drivers and external influences. The current IT organisation and infrastructure is assessed and contextualised. IT risks, as aligned with the institutional risk management

process, are identified. The impact of the resource constraints, resource allocation and the IT budget is clarified. Factors and drivers that will influence the future IT organisation at the university are presented. An application renewal strategy is included, along with current and planned IT projects.

The key results of the process leading to the IT strategy documentation are therefore:

- An overall IT strategy document
- Alignment of the information technology strategy with the institutional strategy and institutional requirements
- A fully aligned enterprise architecture, which provides the framework for technology decision-making and governance
- An explicit IT governance framework for IT decision-making structures and processes
- An information technology plan that takes a position on the suitability, funding priority, and/or timing of the deployment of new and existing technologies in the enterprise
- Guidance for the administrative systems renewal strategy.

The methodology's main advantages are the simple and direct alignment methodology and the explicit relationship between the strategy, architecture, governance and planning documents which provide context, clarity and the capacity to demonstrate explicit linkages between specific operational strategies and the IT strategy.

Much of the available literature[2,3,4,5,6] while providing valuable background, was typically found to be either too detailed or comprehensive to provide practical guidance for the process of creating a suitable IT strategy in our context and culture. The IT organisation was simply not in a position to undertake and complete a task of the magnitude advocated in these publications. Information from the Gartner Group and Meta Group[7,8] (now part of the Gartner Group) provided the necessary guidance and framework[9,10,11,12,13]. Information from the Meta Group[14] proved especially valuable in guiding the process to establish an enterprise architecture. The architectural principles were derived mainly from a confidential IT architecture study performed by IBM at the University of Pretoria in 2000. Documents from the Gartner Group, e.g. the Hype Cycle for Higher Education[15], provided useful input for the technology scan. A Gartner Group Hype Cycle is a graphical depiction of technology maturity, plotting visibility of the technology vs. maturity on a standardised curve. Weill and Ross[16] provided a valuable framework to express IT Governance structures.

STRATEGY FRAMEWORK

The conceptual strategy pyramid illustrated in Figure 1 is annotated with descriptive information and alignment arrows. It depicts the framework used to develop the IT strategy.

The red apex of the pyramid symbolises the published strategy of the institution (in this case, as documented in the now obsolete University of Pretoria publication 'Inspiration for the Innovation Generation, 2002-2005 Strategic Plan'). This strategy, along with other inputs (orange), such as related strategies and technology trends, drives the IT strategy (light yellow). The enterprise architecture (yellow) and IT governance (violet), as well as the resulting technology plan (blue) are depicted as the main pillars supporting the IT Strategy. The link between IT governance and enterprise architecture is depicted by an arrow running between the two sections.

Within the resulting set of strategy documents, relevant sections of the strategy, governance and architecture documentation are annotated with a miniature version of this graphic to indicate context.

DESCRIPTION OF THE METHODOLOGY

A flow diagram, describing the process to derive the integrated set of strategy documents, is depicted in Figure 2. Three independent activities are required to initiate the process:

- Determine, confirm or update client requirements.
- Do a technology scan, which includes reviewing the current technology base.
- Analyse the institutional strategy to extract, distil or derive institutional strategic thrusts or drivers, which lead to IT specific strategy guidelines through creation of an alignment table.

After consolidating the information, the basic strategy framework is composed, the enterprise architecture is derived, and the IT governance analysed and documented. The documents are reviewed and a gap analysis performed before finalising them. In practice this consisted of several iterations before converging in a useful set of documents.

The following sections describe the alignment process, determining the strategy framework, derivation of the architecture and compiling the information technology plan. Detailed operations strategies are finally documented according to a prescribed

template. The process and documents are to be reviewed annually, in this specific case by synchronising with the annual budget cycle and a new institutional strategy that is currently under development.
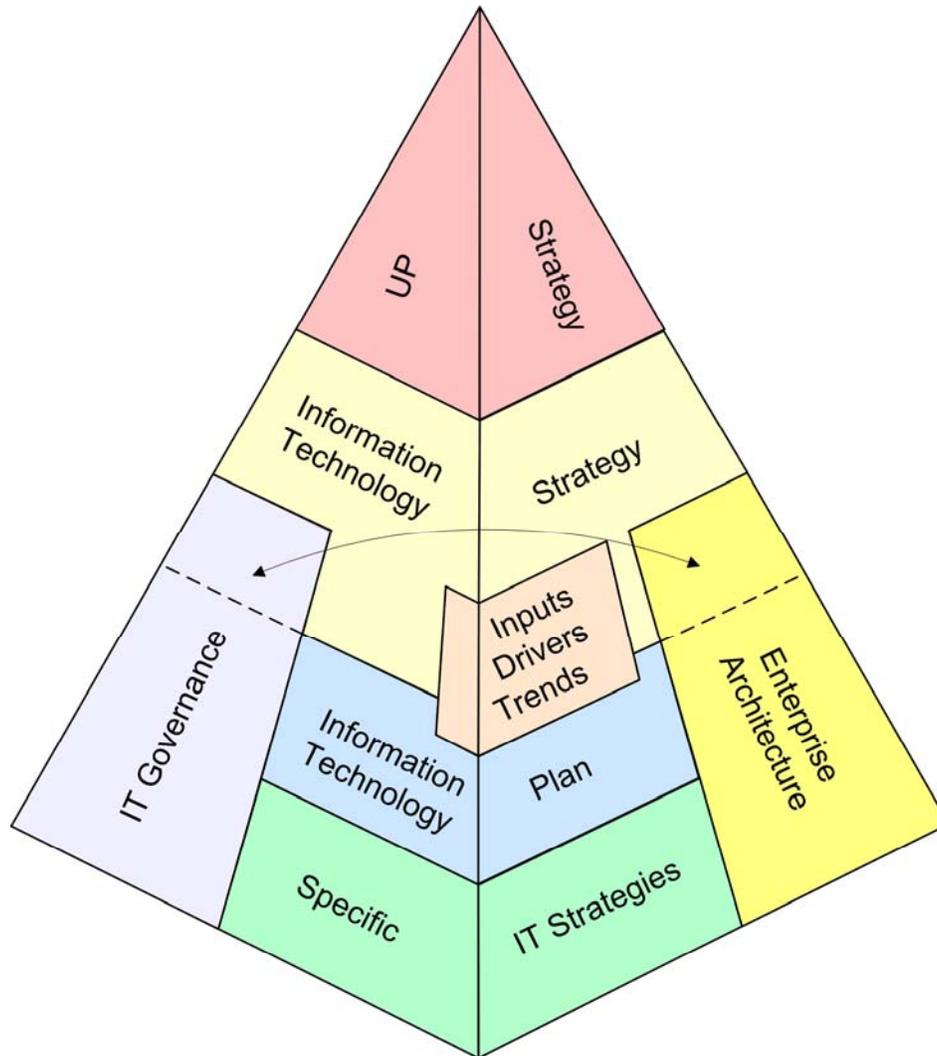

Figure 1: Strategy Framework

ALIGNING THE INFORMATION TECHNOLOGY STRATEGY WITH THE INSTITUTIONAL STRATEGY

In the case of the University of Pretoria, the institutional strategy contains an explicit set of strategic drivers or thrusts. For purposes of strategic alignment, these drivers were used to guide the derivation of IT guiding principles, which provides input to the strategy under construction, along with a technology scan and requirements analysis. Table 1 illustrates the resulting alignment matrix, with more detailed definitions of the IT strategy guidelines listed in Table 2. The IT management team derived and mapped the IT strategy guidelines in a workshop and later confirmed them with the Information Technology Committee, which is the primary advisory governance body for the Department of Information Technology Services.

These IT Strategy Guideline*s* act as guiding principles in the derivation of the enterprise architecture, information technology plan and operational strategies in the Department of Information Technology Services at the University of Pretoria.

The current IT strategic situation was mapped on to a framework developed by Gartner, Inc. (Mack and Frey, 2002). The resulting table summarizes the current internal IT landscape and practice, as well as the future intent.
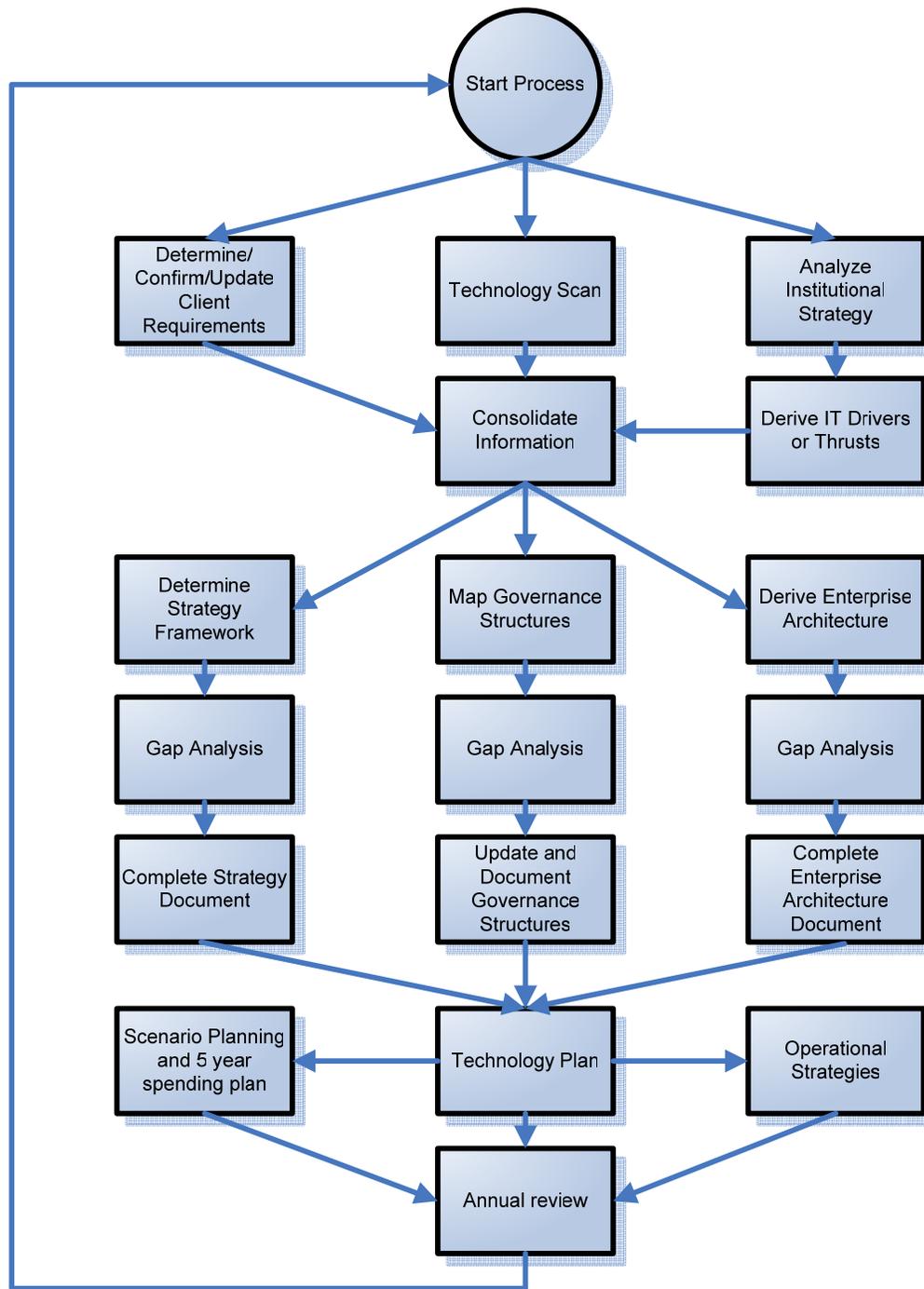
Figure 2: Description of the process to derive the strategy

Institutional Strategic Drivers / IT Strategy Guidelines	Focus on Academic Initiatives	Quality	Local Relevance	Transformation	International competitiveness	Value driven organisational culture	Sustainability	Innovation
Customer orientation and empowerment	•			•		•	•	
Service orientation				•	•		•	•
Risk	•	•			•		•	•
Adaptability & Agility	•		•	•	•			•
Quality		•			•			
Sustainability			•				•	
Innovation								•
Application of appropriate technology	•	•	•		•		•	•

Table 1: Deriving IT strategy guidelines

IT Strategy Guideline	Description
Customer orientation and empowerment	The application of Information Technology will be guided by user requirements. End users must be empowered to utilise IT infrastructure effectively and efficiently.
Service orientation	Provide, package and measure IT infrastructure and support as services to stakeholders
Risk	IT-related risks must be identified, managed and mitigated
Adaptability & Agility	The IT infrastructure and systems must be able to adapt easily and rapidly to changing requirements and external factors, such as changing technology, legislation changes and competitive requirements.
Quality	The quality of IT services and infrastructure must be aligned with the institution's academic and administrative quality requirements
Sustainability	IT infrastructure and services must be sustainable at the required service levels.
Innovation	IT infrastructure and service solutions must be innovative to ensure effective and efficient technology application and to make strategic advantage possible at every opportunity.
Application of appropriate technology	The technology applied in the enterprise IT infrastructure, must be: • Mature, stable, and production-worthy unless specific requirements mandate otherwise. Leading-edge technologies should only be considered where they provide competitive advantage • Cost-effective • Be capable of appropriate sustainable performance and scalability • Compliant with enterprise architecture principles

Table 2: Description of the IT strategy guidelines

DETERMINING THE STRATEGY OUTLINE STRUCTURE

Documentation from the Gartner Group and Meta Group provided guidance in this specific case. Table 3 contains the specific outline used in this case study. The important elements are:

- The derivation of the IT strategy guidelines
- Mapping of the business (or institutional) requirements on to the IT strategy
- Assessment of the current and planned IT landscape
- The role and function of the governance, architecture and planning documents are outlined and contextualised
- Key strategy outputs are listed.

1	Executive Summary
2	Introduction
3	IT Strategy Framework
4	Audience
5	Related documents
6	Strategic alignment, business drivers and external influences
6.1	Derivation of IT Strategy Guidelines
6.2	Business requirements mapped to IT Strategy
6.3	Other Inputs
7	Assessment of the current IT organization and infrastructure
7.1	Operational improvements
7.2	Fit between infrastructure and business
7.3	Enterprise systems and applications assessment
7.4	Resources
7.4.1	Information Technology Budget allocation
7.4.2	Resource alignment
7.5	Strategic IT Differentiators
7.6	Sourcing strategy
7.7	Outline of the planned IT organization and infrastructure
7.7.1	Organizational structure
7.7.2	Changes in the Systems division
7.7.3	Computer laboratories and student computing
7.7.4	Future systems and communications architecture
7.7.5	Business continuity, disaster recovery and data backup
8	Enterprise and Administrative Applications Renewal Strategy
8.1	Scope
8.2	Objectives and desired outcomes
8.3	Possible systems requirements
9	Projects
9.1	Current projects and investigations
9.2	Planned major projects
10	Information Technology Governance
11	Enterprise Architecture
12	The Information Technology Plan – the way forward
13	Key strategy outputs
APPENDIX A:	Mapping of the current IT strategic position into a framework developed by the Gartner group
APPENDIX B:	Gartner Hype Cycle for Higher Education: June 2004

Table 3: Outline of the Main Strategy Document at the University of Pretoria

DERIVING THE ENTERPRISE ARCHITECTURE

According to the Meta Group (Buchanan, 2004), Enterprise architecture (EA) can be seen as a strategic planning process that ensures alignment of technology infrastructure with enterprise strategy and IT strategy. It is the bridge between strategy and implementation. The enterprise architecture is a key outcome of the strategic IT planning process. The guiding principles provided by the architecture create an aligned planning and decision-making framework for technology planning, IT investment and IT risk management. It is a global best practice for the IT organisation to create and maintain an enterprise

architecture. A suitable EA is a key enabler for successful application and leverage of information technology in an organisation.
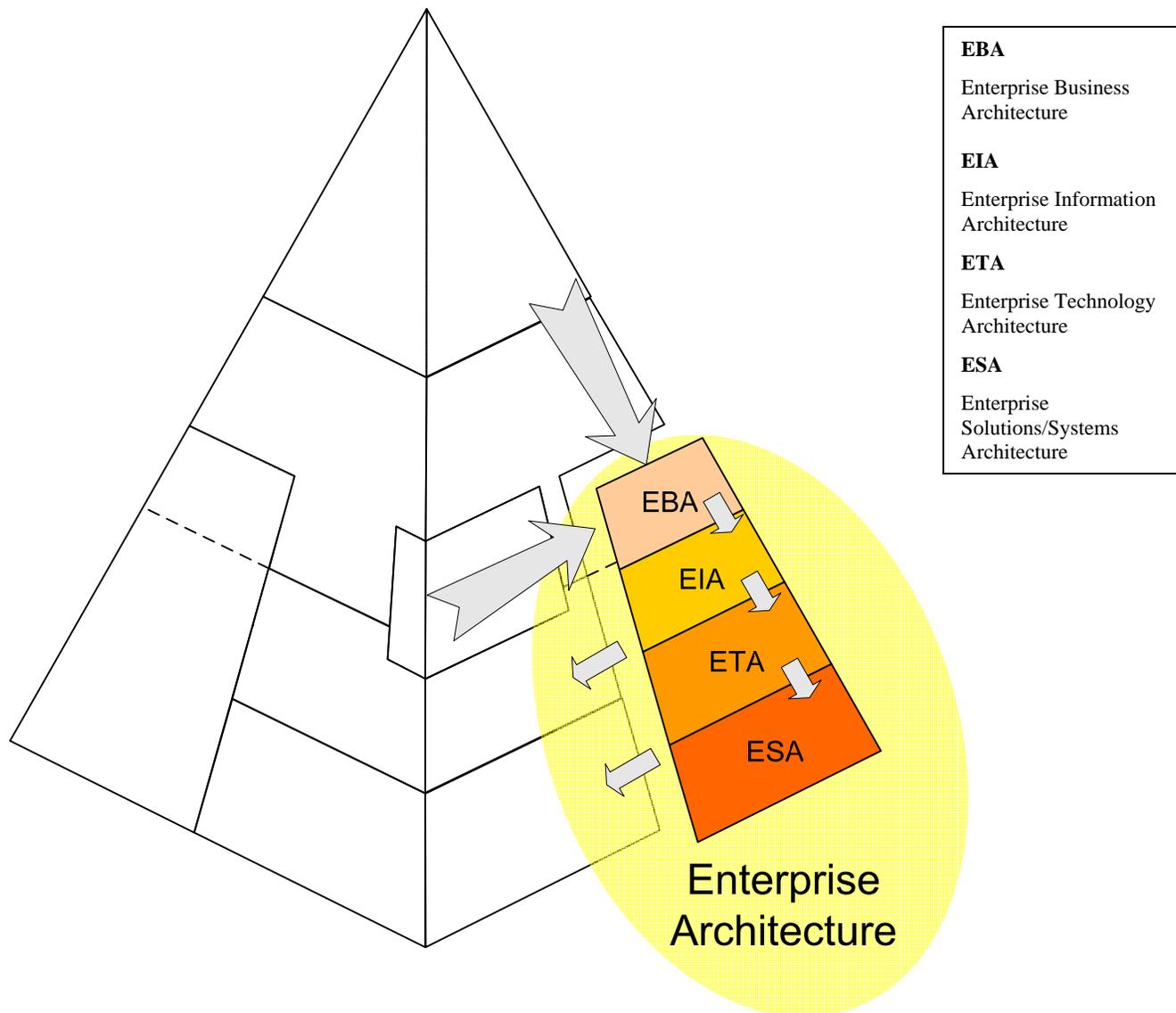

EBA

Enterprise Business Architecture

EIA

Enterprise Information Architecture

ETA

Enterprise Technology Architecture

ESA

Enterprise Solutions/Systems Architecture

Figure 3: Deriving the Enterprise Architecture

The enterprise architecture has four components, which covers the spectrum from business architecture, through information architecture and technology architecture, to the solutions (or systems) architecture. These architecture components are graphically illustrated in Figure 3. It demonstrates the context of the enterprise architecture and its components in the IT strategy framework (compare with the strategy framework in Figure 1). The positions of the architecture components in the IT strategy framework are indicated in Figure 3. The arrows indicate the inputs and sequence of derivation of each component.

In this case study, the enterprise business architecture (EBA) expresses the key elements of the institutional strategy as a collection of key business (or institutional) requirements, from which a set of categorised architectural principles are derived, through a traceable list of drivers In the case of the EBA, the drivers are precisely the IT strategy guidelinesthat were derived during the alignment process used in the main strategy document.

The EBA is implemented or expressed by the following layers of the architecture, including the derived enterprise information Architecture (EIA), the following enterprise technical architecture (ETA) and finally the enterprise solutions (or systems) architecture (ESA). These architectures are derived hierarchically, by decomposing the architectural principles in the layer above into a new more detailed set of key requirements which again leads to a new set of architectural principles. The latter then drives the derivation of architectural principles in the subsequent architectural layer. This process is repeated until the ESA is complete.

This level of abstraction was sufficient for the process of establishing an enterprise architecture at our institution. It falls well short of the formal architectures and architectural processes currently advocated by the Gartner Group and, for examples architectures based on the well-known Zachmann framework (Zachmann, 1987). Being in a position to implement such complete architectures would likely be beneficial, but very resource-intensive to maintain. The constraints under which this architecture had to be established simply did not allow implementation and the associated maintenance requirements of a more complete architecture framework. The set of guiding principles was in our case sufficient to guide the IT governance and decision-making processes, which was the main purpose of establishing the architecture in the first place.

Applications of the ESA principles provide guidance for:

- Systems architecture
- Software architecture
- Application portfolios

while ensuring maintaining alignment with the preceding architecture layers and the institutional strategy.

The guiding principles express the desired future state of the architecture. In this case study, it resulted in the graphical depiction of the future state architecture expressed in Figure 4.

The architecture document and architecture content need to be maintained and governed. For governance purposes the usual practice is to utilise an architecture review board or committee, which was constituted for this purpose in our specific case. It is crucial to manage any necessary deviations from the architecture as formal exceptions. The architecture review committee will consider any requests to establish IT infrastructure or systems, including those that contravene the architectural principles, and then subject the request to a gap analysis. After consideration, the architecture review committee could:

- Deny the exception request.
- Grant the exception request.
- Grant a modified or renegotiated exception request.
- Adapt or extend the architecture to accommodate the request.
- Escalate the request if warranted by the potential business impact of the request.

An example of a specific kind of deviation is the following: While the enterprise architecture at the University of Pretoria prescribes a Java/J2EE infrastructure, operational requirements, product availability, or cost constraints necessitate utilising Microsoft server technology in certain cases. Under such circumstances, an effort is made to integrate at least the user interface seamlessly into the web portal to ensure consistent user access to all systems. Integration at access control, user interface, business rule and data level requires careful analysis when considering deviations. Clearly, allowing a specific exception does not establish a precedent, and all deviation requests have to be measured against the architectural principles, irrespective of previous deviations. The architecture exception process refines the architecture continuously. It contributes towards organisational learning in the enterprise IT environment.

The architecture document provides input to the following processes or outcomes:

- Architectural models on various levels of abstraction.
- Software and middleware architecture
- Infrastructure architecture
- Workstation architecture
- Project portfolios
- Inputs to operational strategies
- Sourcing or writing of new enterprise software systems
- Technology planning
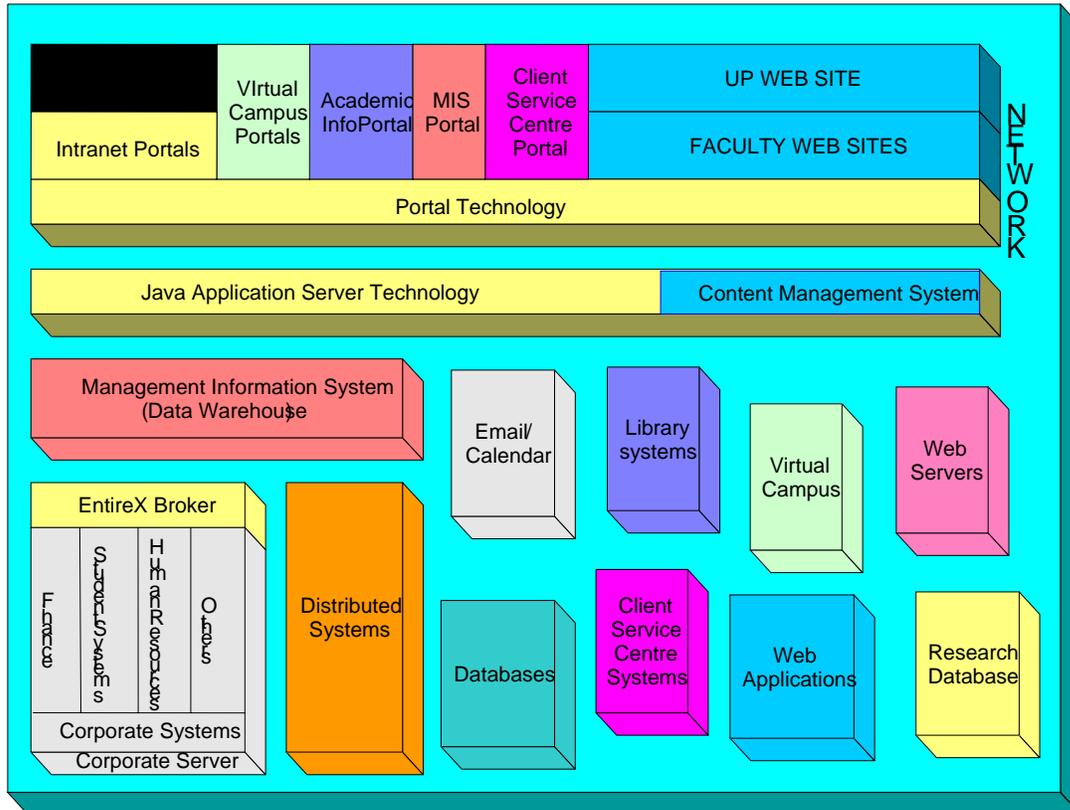- Guidelines for IT Governance and decision-making.

Figure 4: The future state architecture for the University of Pretoria in 2005

FORMULATING THE GOVERNANCE STRUCTURE

IT governance (or IT corporate control) comprises mechanisms to obtain an appropriate balance between IT risk, value and cost in an organisation. Weill and Ross, (2004) define IT governance as specifying the decision rights and accountability framework to encourage desirable behaviour in using IT.

IT governance:[17]

- Aligns IT objectives with business objectives.
- Delivers value (as opposed to necessarily reducing costs).
- Mitigates risks.
- Provides a way to measure performance against goals.
- Helps to ensure business value is delivered within schedule and budget.
- Assists in delivering professional IT services to the Institution.

Figure 1 indicates that IT governance links directly to the information technology strategy, the technology plan and specific IT strategies. There is an explicit bidirectional link to the enterprise architecture. The enterprise architecture expresses principles that guide IT decision making. The IT governance structures determine how the decisions will be made, mandated and implemented.

The IT Governance framework is based directly on that described by Weill and Ross (2004) and depicted in Table 4, which contains the institutional strategic drivers and the derived IT strategy guidelines (which also provided input to the architecture). These drivers and guidelines are harmonised with the governance arrangements and the governance mechanisms. The final linkage is with the business (or institutional) performance goals and IT metrics and accountabilities. The reader is referred to Weill and Ross (2004) for detail.
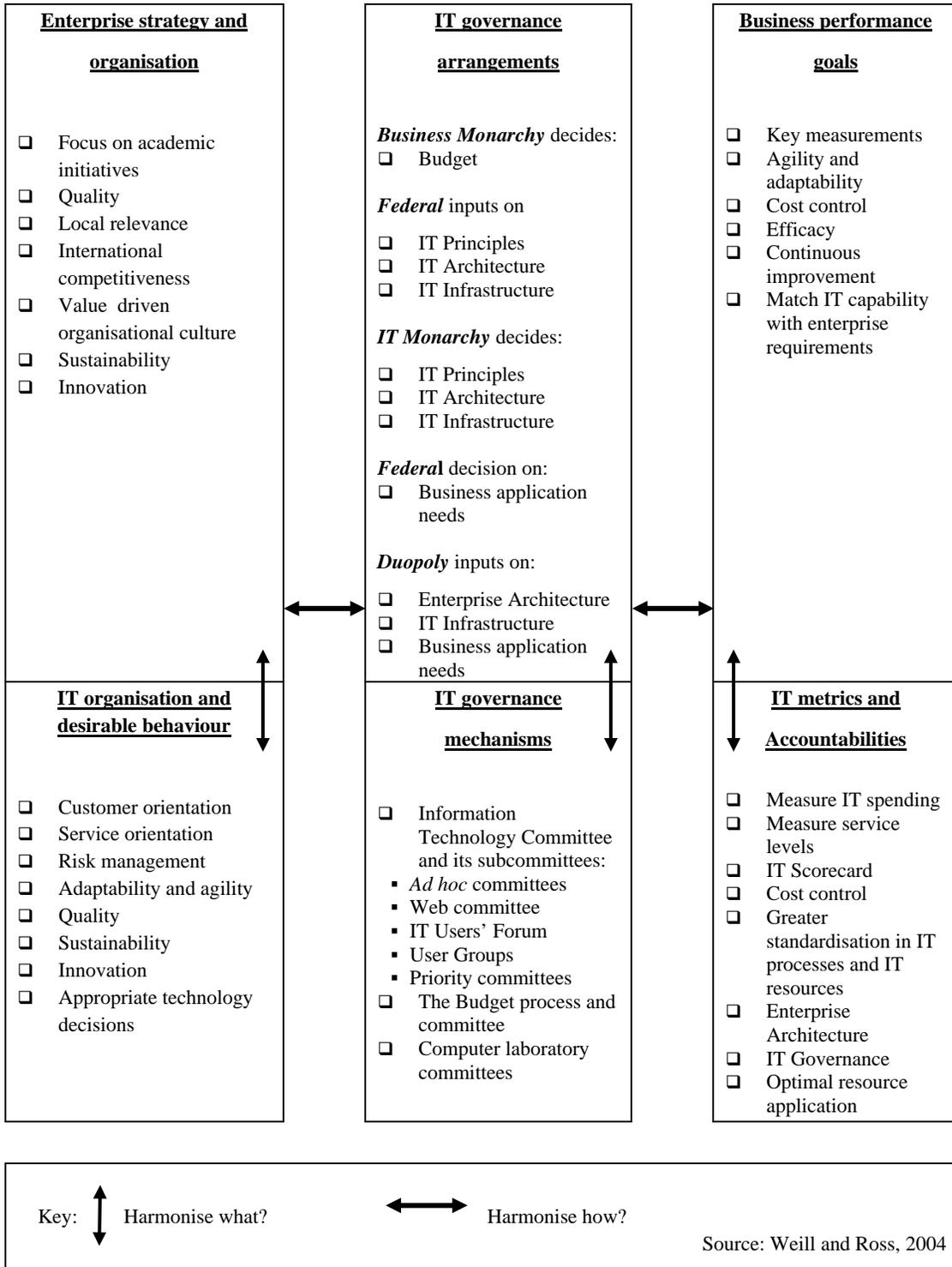
Enterprise strategy and organisation	**IT governance arrangements**	**Business performance goals**
❑ Focus on academic initiatives ❑ Quality ❑ Local relevance ❑ International competitiveness ❑ Value driven organisational culture ❑ Sustainability ❑ Innovation	***Business Monarchy* decides:** ❑ Budget ***Federal* inputs on** ❑ IT Principles ❑ IT Architecture ❑ IT Infrastructure ***IT Monarchy* decides:** ❑ IT Principles ❑ IT Architecture ❑ IT Infrastructure ***Federal* decision on:** ❑ Business application needs ***Duopoly* inputs on:** ❑ Enterprise Architecture ❑ IT Infrastructure ❑ Business application needs	❑ Key measurements ❑ Agility and adaptability ❑ Cost control ❑ Efficacy ❑ Continuous improvement ❑ Match IT capability with enterprise requirements
IT organisation and desirable behaviour	**IT governance mechanisms**	**IT metrics and Accountabilities**
❑ Customer orientation ❑ Service orientation ❑ Risk management ❑ Adaptability and agility ❑ Quality ❑ Sustainability ❑ Innovation ❑ Appropriate technology decisions	❑ Information Technology Committee and its subcommittees: ▪ *Ad hoc* committees ▪ Web committee ▪ IT Users' Forum ▪ User Groups ▪ Priority committees ❑ The Budget process and committee ❑ Computer laboratory committees	❑ Measure IT spending ❑ Measure service levels ❑ IT Scorecard ❑ Cost control ❑ Greater standardisation in IT processes and IT resources ❑ Enterprise Architecture ❑ IT Governance ❑ Optimal resource application

Key: ↕ Harmonise what?   ↔ Harmonise how?

Source: Weill and Ross, 2004

Table 4: Governance Design Framework.

Weill and Ross (2004) defines the IT governance arrangements used in Table 4 as follows:

- Business monarchy – Top managers (Executive Level)
- IT monarchy – IT Management (Director and Deputy Directors)
- Feudal – Each business unit (Faculty or Support Service) making independent decisions
- Federal – Combination of the corporate centre and business units with or without IT people involved
- IT duopoly – IT group and one other group (e.g. top management or business unit leaders)
- Anarchy – Isolated individual or small-group decision-making.

Table 5 links major IT activities, requirements and structures to IT governance in a practical way (KPMG, 2004).

		Information Technology Governance		
Corporate Governance	Information Technology Governance	IT Governance Organisational Structure ➡	IT Risk Management	Releasing Value from IT
		IT Portfolio Management and Project Management ➡		
		IT Legislative Compliance (King II, ECT act, etc.) ➡		
		Link to internal and external audit (e.g. utilising frameworks such as Cobit) ➡		
		IT Resource Management (People, Hardware, Software, Data) ➡		
		Business Continuity Management ➡		
		IT Key performance Measurements (and benchmarking) ➡		
		Information Security Governance ➡		
		Business Process Efficiencies ➡		

Source of information: KPMG, 2004

Table 5: Governance Linkages

Further elements addressed in the governance document include:

- Documenting the IT governance structures, inside and outside of the IT organisation
- A statement of intent about, and references to, the IT policy framework
- A gap analysis to indicate areas of improvement
- Risk analysis, aligned with the institutional risk register

TECHNOLOGY PLANNING

The information technology plan lists and contextualises relevant technologies and takes a position on the suitability and/or timing of their deployment. This is done within the context of the IT strategy, IT governance and enterprise architecture. The information technology plan is one of the key foundations and outputs of the information technology strategy.

The main topics addressed in the plan are the following:

- Technology scan
- Technology roadmap
- Technology requirements and deployment, based on motivated client input and aligned with the key requirements expressed in the Enterprise Architecture
- A five-year business plan for technology deployment, expressed in terms of an IT investment portfolio which balances cost benefit and risk (Buchanan 2004).

As part of the technology scan and prioritisation, the Gartner Hype Cycle for Higher Education (Yanosky et al, 2004) is used as a source for the technology scan, and the specific technologies are prioritised according to institutional needs in the format depicted in Table 6. Each technology is annotated with the symbol to indicate time to maturity.

High					
Medium					
Low					
Current priority	Technology Trigger	Peak of Inflated Expectations	Trough of Disillusionment	Slope of Enlightenment	Plateau of Productivity

Legend:

○ - time to maturity less than 2 years

◉ - time to maturity 2 to 5 years

● - time to maturity 5 to 10 years

Table 6: Interpretation template for the Gartner Hype Cycle in terms of institutional priorities

The technology roadmap includes a strategic position on key technologies and specific technology areas, e.g. legacy extension, systems renewal, single sign-on, document lifecycle management, etc. These specific technology areas are selected according to requirements and architectural alignment.

The five-year business plan is categorised according to a framework advocated by the former Meta Group (Buchanan 2004), as illustrated in Figure 5.

All planned expenditures are segmented in terms of non-discretionary and discretionary costs, which are further grouped into the major categories of 'Run The Business' (RTB), 'Grow The Business' (GTB) and 'Transform the Business' (TTB). This provides a very convenient framework to do scenario planning by including core and non-discretionary expenditure in all scenarios; and exploring variations in GTB and TTB expenditure according to alternative spending priorities.

In this context RTB is interpreted as the minimum expenditure to maintain current IT service levels and capacity, without catering for growth. It includes refresh or replacement cycles and minimum hardware upgrades to support newer versions of production software where required. GTB is interpreted as RTB expanded to anticipate growth in usage, but without significant new functionality. Adding new IT functionality in systems or infrastructure is categorised as TTB.

As an example, replacing legacy administrative system silos with newer best of breed systems that are not sufficiently integrated to provide the full benefits of Enterprise Resource Planning (ERP) functionality, would be classified as RTB, since it would be considered a straightforward refresh of existing functionality. Legacy extension by means of web-enablement of legacy systems that would make the systems available to a larger number of users could be classified as GTB. Replacing legacy systems with a fully integrated ERP suite, with cross-silo processes could be classified as TTB.

Table 7 presents a simplified view, containing example capital projects, of the framework used to do capital spending planning for each scenario. Planned operating expenditure should be tracked in a similar fashion to keep track of total costs. Although it was not done in this case study, personnel budgets should be linked to the capital expenditure and operating expenditure plan as well, if the institution uses a separate source of funding for the personnel budget. Graphs or tables which analyze historical IT spending should also be provided to indicate the context of the spending plan.
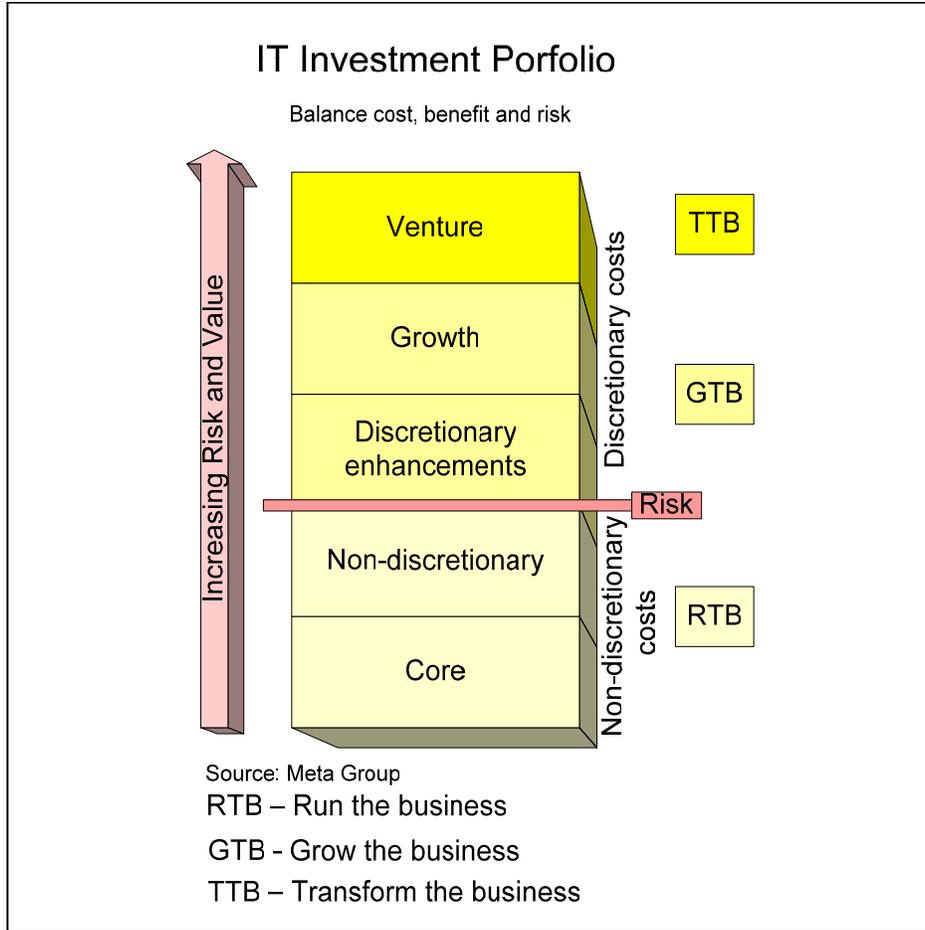
Figure 5: Investment Portfolio Framework

	Capital Project	Category	2006	2007	2008	2009	2010
1	Implement IP Telephony (VOIP)	RTB					
2	Business continuity and disaster recovery	RTB					
3	Desktop and Laptop replacement/refresh	RTB					
4	Physical access control	GTB					
5	New computer laboratories	GTB					
6	Additional systems development and integration	GTB					
7	Wireless access in lecture halls	TTB					
8	Grid computing and clusters for research	TTB					
		TOTAL					

Table 7: Planning long-term expenditure (example)

DERIVING OPERATIONAL STRATEGIES

A specific standard template is used to structure and align specific operational strategies or implementation plans. The format contains the sections outlined in Table 8. One of the inputs is an alignment table similar to Table 1. The IT strategy guidelines in Table 1 are now arranged horizontally on top, and a new set of guiding principles for the specific strategy is derived to be used as guidance and therefore to ensure alignment with the all the strategy components, including the alignment table in the main strategy, IT governance and enterprise architecture.

CONTENTS		
INPUTS	I1	Alignment table and strategic objectives/drivers
	I2	Architectural Principles
	I3	Risks to be addressed
	I4	Governance
STRATEGY DESCRIPTION	S1	Objectives
	S2	Outline/Description
	S3	Customers affected
	S4	Lifecycle
	S5	Benefits and risks
	S6	Constraints and limitations
OUTPUTS	O1	Budget implications
	O2	Staff and other resource implications
	O3	Inputs to IT Governance (policies, procedures, standards)
	O4	Processes
	O5	Projected impact on the organisation
	O6	Action Plans

Table 8: Template for documenting operational strategies

OUTCOMES AND CRITERIA TO DETERMINE SUCCESS

An institution that does not possess a current documented strategy could still use the methodology, since the institutional drivers could be determined by interviewing or having a workshop with the executive and senior management.

Factors that would limit or negate the applicability of this methodology include:

- If the identified institutional drivers do not fully support the actual strategy (as opposed to the documented institutional strategy if it exists), the whole effort would be pointless.
- If the IT organisation has insufficient standing and acceptance in the institution, it would be very difficult to get acceptance for the architectural principles, and governance would most likely be ineffective, or unaligned with the realities of the IT organisation.
- Insufficient resources to maintain and implement the strategy.
- A lack of will to enforce and formalise the architecture exception process.
- A very decentralised IT organisation.

The University of Pretoria has a centralised IT organisation. Institutions which have a very decentralised culture or a federated IT model will most likely find it difficult to get agreement on architectural principles and might find execution of the IT strategy more difficult.

Even with a centralised IT organisation, exceptions will have to be managed at any university. The way our institution approaches such a situation is firstly to communicate and then try to obtain agreement on support issues and service levels. In such cases, which typically manifests themselves as rogue servers in academic areas like Engineering, Computer Science, or Natural Sciences, we try to be as accommodating as possible, while attempting to manage risk to the institution at the same time. In some cases there is no practical alternative to simply managing the situation as an exception. If deadlock occurs, the IT organisation escalates the issue to the responsible Deans or Vice Principals. The assistance of the internal audit function can sometimes be sought to mitigate risks in extreme situations.

At the University of Pretoria the process was reasonably successful, due to support from the executive and senior management of the university, as well as the commitment of the IT management team to both the process and resulting strategy. Although there is significant room for improvement, the IT organisation has a sufficient amount of credibility in the organisation to obtain strong executive support for developing and executing the strategy.

In its current form, the methodology would probably not go far enough in a large organisation, such as a financial institution, large production facility or a large retail environment which requires a well established and strong architecture function as well as strong IT governance. In its current form, this methodology produces an architecture which is considerably better than nothing, and can contribute significantly to an institution like a university where effective IT governance is sometimes lacking, and divergent user requirements can only be coordinated through improved IT governance and the establishment of a functional enterprise architecture. On the other hand, it is probably overkill for a significantly smaller university or educational institution that may have insufficient resources to apply the methodology and execute the strategy. As presented, the methodology contains many compromises applicable to the situation as it was at the University of Pretoria in 2005, and may well have to be modified to the needs of other institutions. However, the basic framework should assist most organisations that need to establish a new or improved IT strategy.

CHALLENGES AND CRITICAL ISSUES

The strategy, architecture and governance that result from application of the technology need to be further enhanced in some areas, including the following:

- The IT strategy documents at the University of Pretoria still do not express the business or institutional value of IT with sufficient clarity in non-technical institutional language. It needs to be addressed in the main strategy document.
- Risk analysis and planning should be expanded and improved.
- It should expand further on IT portfolio management.
- The architecture is described at a relatively high level of key requirements and guiding principles. The description of the future state architecture and architecture maintenance processes could be expanded significantly. This will be required to support large projects such as ERP implementation.
- The information technology plan should have a section to address IT capacity planning explicitly.

STATUS AND RESULTS OBTAINED

The IT strategy, architecture, governance and plan are accepted as key elements in the governance of the planned ERP implementation at the University of Pretoria. The documented strategy is currently used to guide and justify IT spending and priorities to the executive and budget committee of the institution. The strategy guides the annual IT budget process. The information technology plan provides input into the institutional long-term capital planning strategy.

Continued success will depend on the ability and will to maintain the momentum and keep the strategy current and relevant.

CONCLUSION

The methodology presented in this paper, generates an integrated and interlinked set of documents that comprise a comprehensive, institutionally aligned IT strategy. When attempting to compile a new IT strategy, it is often not clear what the best way would be to initiate the process, and what the scope of the strategy should be. Following the methodology as presented facilitates and simplifies these issues. The IT strategy framework in Figure 1 clearly indicates the relationships between the components of the IT strategy. The process flow in Figure 2 provides a road map for creating a complete and consistent IT strategy, which is demonstrably aligned with the institutional strategy. The IT strategy guides IT decision-

making and resource allocation explicitly by means of architectural principles and a governance framework, which is intended to unlock the full value of IT at a university or other institution of comparable organisational complexity.

ACKNOWLEDGEMENTS

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