

**DETERMINING THE LEVEL AND EXTENT OF INFORMATION TECHNOLOGY
OUTSOURCING SERVICES IN THE SOUTH AFRICAN HIGHER EDUCATION
ENVIRONMENT**

WILLIAM RICHARD PENGILLY

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DECLARATION

I, William Richard Pengilly, declare that this research report is my own work. It is submitted in partial fulfilment of the requirements for the degree Masters of Business Administration in the University of Johannesburg, Johannesburg. It has not been submitted for any degree or examination in any other education institution.

WR Pengilly



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ABSTRACT

The South African public Higher Education environment has been going through changes during the past five years. Thirty six institutions have been merged and consolidated into twenty three institutions. There is considerable financial pressure on these institutions, and this have an impact on the provision and maintenance of a world class technology environment.

This study examines the extent of outsourcing in the public Higher Education environment in South Africa, and determines if the environment is unique. It also looks at the aspect of improving service delivery through outsourcing or co-sourcing. The research was conducted by means of a survey, consisting of two parts, sent to all twenty three institutions. A 70% response was received on the questionnaire.



The research survey determined the technology environment, the attitude towards, and the extent of outsourcing within the environment, as provided by the Chief Information Officers / Information Technology directors. The findings indicate that there is an element of uniqueness within the higher education environment, and that the institutions face challenges, specifically with relation to skill shortages. Furthermore, it finds that there are areas where co-sourcing can provide a benefit and assist in alleviating the challenges. The study also identifies various areas of further study.

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CHAPTER 1

INTRODUCTION, PROBLEM STATEMENT AND OBJECTIVES OF THE STUDY

1.2 BACKGROUND

Within the South African public higher education sector, the primary source of funding is the South African Government (Mutula, 2001:116). This funding have been steadily declining, putting pressure on universities to cut back on budgets, with the ensuing pressures on maintenance and administrative expenditure, including the information technology environment (Mutula, 2001:116). Yet, in order for the higher education institutions to remain competitive, and provide support to the academic activities, it is imperative that the technology infrastructure be well supported and maintained. Within the above circumstances it is necessary to search for approaches that may provide a solution to the situation. One of the options that may provide a solution is outsourcing of information technology services.

Wood (2004:10) states that: “Outsourcing assumes that if an institution cannot provide a service or product at less cost than, and of equal quality to, an external provider, then it should purchase the service or product from an external provider.” Outsourcing of activities has been used for many years in various industries. According to Gurbaxani (1996:45) the first major entry of the outsourcing industry into the technology market was in 1989, when Kodak outsourced major components of its information technology function. Since then there have been a steady increase in the outsourcing of technology and other functions.

The primary reasons for outsourcing were traditionally to improve the value chain and enhance the efficiency of information technology resources. More recently, according to DiRomualdo and Gurbaxani (1998:67), two other major strategic reasons emerged;

outsourcing for business impact, which focuses on improving information technologies' contribution to company performance within its existing lines of business, and commercial exploitation with the focus on leveraging technology-related assets - applications, operations, infrastructure and know-how - in the marketplace through the development and marketing of new technology-based products and services.

The 8th annual outsourcing index survey done by The Outsourcing Institute (Casale, 2005) identifies the following as the primary reasons for outsourcing:

- reduce and control operating costs;
- improve company focus;
- free resources for other purposes;
- gain access to world-class capabilities;
- resources are not available internally;
- accelerate reengineering benefits;
- function difficult to manage or out of control;
- make capital funds available;
- share risks;
- cash infusion; and,
- asset transfer.

The reduction of cost and better utilisation of resources are named in both articles as primary reasons. The Outsourcing Institute survey also states the unavailability of internal resources (staff shortage) as a reason (Casale, 2005).

Based on discussions with various Information Technology Directors / Chief Information Officers of South African higher education institutions, and based on experience from the

researcher, the author is of the opinion that the major challenges inhibiting the effective provision of information technology services are;

- a lack of funding;
- a lack of resources;
- a shortage of skills; and,
- Information Technology perceived as not being part of the core business functions.

It is interesting to note that the reasons being cited as inhibiting factors by these Information Technology Directors are also some of the primary reasons listed in the survey on why companies outsource services. However, from discussions with other institutions and experience within the authors own institution, it is the researcher's opinion that very little outsourcing of information technology services is done in the higher education environment. This discrepancy will form the basis of the research.

From experience and communication with Chief Information Officers in the higher education environment, the author is of the opinion that Mutulas' (2001:116) research is still relevant, and that institutions are constantly under pressure to limit cost. Yet, the pressure to provide acceptable information technology support and services to enable the business to remain competitive is increasing. At the same time it remains difficult to retain skilled staff and protect its human resource capital from leaving and entering the private business sector.

1.2 PROBLEM STATEMENT

The role of information technology and information technology related technology is playing an increasing role in the success of businesses. It forms the basis on which a company can gain competitive advantage. Competitive advantage related to information technology can be

described as “the use of information (technology) to gain leverage in the marketplace” (McLeod & Schell, 2001:28). Within the education sector information technology can play a key role in classroom performance (Department of Education and Department of Communications, 2001:10). In order to provide support for the technology environment that will support the higher education institutions, it is necessary to provide an ever improving service, although the funding for the provision of the information technology services cannot be provided only by government (Department of Education and Department of Communications, 2001:5). Based on the above issues, it is clear that higher education should be looking at alternative means of funding or providing the services. Within this context the problem statement can be defined as:

Can outsourcing of information technology services provide a basis for improved and cost effective operation and management of the information technology function within Higher Education?

1.3 GOALS OF THE STUDY

The main aim of the study is to investigate if outsourcing within the higher education information technology environment can add value to the business. The factors influencing the outsourcing decision within higher education will be investigated and compared with general factors influencing outsourcing. This will be done to determine if there are differences, and the reasons why these differences exist.

To reach the main objective of the study the following goals need to be attained:

- to establish if a model of co-sourcing can enhance the delivery of a cost effective service;

- to determine the uniqueness of the higher education information technology services environment; and
- the status of information technology outsourcing within the higher education environment.

The focus of the research will be on these primary reasons for outsourcing information technology and related services. Information technology services within this research dissertation are seen as the functions utilised to support the information technology environment within the higher education market. These include computer support, software support, network support and related functions. It does not include software development and maintenance.

1.4 RESEARCH METHODOLOGY



The study consist of secondary research composed of a literature study that will include textbooks, articles, research reports, electronic databases and other publications relevant to information technology outsourcing. The challenges and opportunities presented by outsourcing within the information technology services environment, and the relationship to the different management disciplines will be scrutinised and discussed. This will provide the background to the primary research, which will be conducted by means of a survey by questionnaire. The questionnaire contains both unstructured and structured questions. The unstructured questions are used to determine demographics and provide the respondent the opportunity to provide additional information. It is primarily used in section one of the questionnaire to establish the extent of technology usage within the institutions. Section two contains questions relating to the primary research. The questions are rated using the Likert scale with a 1 to 5 rating to evaluate the respondent's attitude towards outsourcing.

1.4.1 Literature study

A full literature study will be done to provide a background on the outsourcing environment as related to the services within information technology. This will provide the reader with a comprehensive understanding of the environment and forces that play a role in the outsourcing environment. Although the researcher could not find any relevant formal literature relating to information technology services or the outsourcing of such services in the South African public higher education sector, the review will include research regarding the outsourcing of technology in South African industries. Information regarding the international tertiary outsourcing market will be included in the research if relevancy can be established.

1.4.2 Survey



The survey was done by sending questionnaires to all South African Universities that are government funded. The questionnaires were sent to the Information Technology Director / Chief Information Officer. The questionnaires consist of two parts; the first utilised to establish the extent of the technology environment within higher education, and the second part will form the basis of the primary research. All information received will be treated with utmost confidentiality. The questionnaire is provided as Annexure A.

1.5 LIMITATIONS OF THE STUDY

The study will focus specifically on the outsourcing of information technology services in the South African public higher education environment. It will furthermore not attempt to do comparisons with international trends and methodologies, except where it is standard practice

and relevant to the South African environment. Offshore outsourcing is excluded from the study, as this pertains primarily to work done in another country without direct customer interaction (Wikipedia, 2006), and the services component as defined in the research will require on-site interaction.

1.6 PROBLEMS ENCOUNTERED DURING THE STUDY

Although the entire South African higher education community that is funded by government has been surveyed, it is a small sample base of 23 Universities (Department of Education, n.d.). Based on the size of the sample population for the survey the following issues may affect the validity of the survey:

- not all institutions provided the required information. The South African higher education environment is small, and fears exist that institutions can be identified by the information;
- information provided may not be complete; and
- information may not be accurate, mainly with regard to financial information. This may occur if the Chief Information Officer does not have access to financial information outside the Information Technology domain.

The study will be conducted in an ethical manner to minimise uncertainty. According to De Vos (2003:65-67), the following aspects are important:

- informed consent: the objective of the study is stated clearly;
- deception: all relevant information will be provided to the respondents;
- anonymity: privacy and anonymity will be maintained at all times. If the possibility of identification exists, and it is in the interest of the research to identify an institution, formal approval will be obtained from the institution; and

- confidentiality: all information will remain confidential and will not be made available to external entities. Information will be processed and presented within the research dissertation.

To compensate for possible inaccuracies, the researcher will interview respondents that return incomplete surveys. The researcher will furthermore acquire omitted financial information from the relevant financial officers.

1.7 TERMINOLOGY

Chief Information Officer

- The Chief Information Officer is the head of Information Technology within Higher Education. Certain institutions also use the term Information Technology Director for this position.

Co-sourcing

- “Co-sourcing is where a business function is performed by both internal staff and external resources, such as consultants or outsourcing vendors, with specialized knowledge of the business function.” (Infosys, 2006).

Higher Education

- Within the context of the dissertation this is all the public Universities in South Africa that receives government grants.

Information Technology services component

- These are the functions utilised to support the Information Technology environment within the Higher Education market. These include computer support, software support, network support and related functions such as printing.

Outsourcing

- “A contractual relationship between an external vendor and an enterprise in which the vendor assumes responsibility for one or more business functions of an enterprise.” (White, 1996:xiv).

1.8 CHAPTER OUTLINE

Chapter 2 provide the background and history of information technology outsourcing through a literature review. It will furthermore focus on the relevance of information technology outsourcing as it relates to the services component. Outsourcing, and its relationship with the different management disciplines, such as strategy and operational management, will be explored.

The status of information technology usage and support within the South African higher education sector is examined in chapter 3. This chapter provides a background of the Higher Education environment in South Africa and the technology in use.

The methodology used and the findings are described within chapter 4. The rationale behind the manner in which the research was conducted is fully explained. It furthermore focuses on the relationships between Chapter 2 and Chapter 3, and creates the basis for Chapter 5.

Chapter 5 will be dedicated to conclusions reached from the research results. Propositions and recommendations will be provided. Possible areas of further study will be explored and suggested. The conclusions will be presented in a way that is easily understood, with the focus on the application of the research findings.

CHAPTER 2

OUTSOURCING INFORMATION TECHNOLOGY

2.1 INTRODUCTION

“Sometimes words, or groups of words, found in the English language have many definitions or meanings.” (O’Brien & Phillips, 1995:1). Similarly, outsourcing has also been described in many different ways, from the narrow description of “Outsourcing (or contracting out) is often defined as the delegation of non-core operations or jobs from internal production within a business to an external entity (such as a subcontractor) that specializes in that operation.”(Wikipedia, 2006), to the all encompassing description of Greaver (1999:3), which describe outsourcing as “the act of transferring some of an organisation’s recurring internal activities and decision rights to outside providers, as set forth in a contract. Because the activities are recurring and a contract is used, outsourcing goes beyond the use of consultants. As a matter of practice, not only are the activities transferred, but the factors of production [human resources and assets] and decision rights often are, too.”

Within the context of this dissertation, the following description of White (1996:xiv) is used; “A contractual relationship between an external vendor and an enterprise in which the vendor assumes responsibility for one or more business functions of an enterprise.” It provides a balance between the two extremes, and is more descriptive of the types of outsourcing that applies to information technology. To understand the current environment of information technology outsourcing it is important to be aware of the progression of outsourcing from its inception.

2.2 HISTORY OF OUTSOURCING

Although technology outsourcing is generally accepted to have emerged in the 1960's, the concept of outsourcing can be traced back to the 19th century with agreements between England and India. This section explores the background and history of outsourcing.

2.2.1 Background of outsourcing

Outsourcing, in various forms, have been used as an alternative within the business world for a long time. The Wall Street Journal, in an article in 2004 states that, as far back as the 1830's, work in the textile business was outsourced from India to England in order to lower cost. Outsourcing is said to have originated in the services industry and spread to different categories of business, including the information technology domain (Cyber Futuristics, 2007). Although outsourcing was initially entered into to save money, it has evolved to encompass various disciplines, and is now being implemented as a strategic initiative (Van der Spoel, 2000:6).

There are different views of when technology outsourcing started. Berkman (2001) place it in the early 1980's, while Bendor-Samuel (2000:38) traces it back to when Ross Perot established EDS in 1962 (Free Encyclopaedia of Ecommerce, n.d.) in order to provide computer processing time to companies that did not have the technical expertise to operate their equipment. Regardless of when it started, the early adopters outsourced mainly due to a lack of skills in the field of computing (Free Encyclopaedia of Ecommerce, 2007). The outsourcing companies at that stage benefited from economies of scale (Berkman, 2001), as the cost of computing was prohibitive and only the major companies could afford to provide their own systems.

As specialisation became more common, companies contracted out parts of their services (Maynard, 2007.) to companies that specialised in their respective categories. These services were not perceived as core to the company (Berkman, 2001), but as value added services.

2.2.2 The evolution of outsourcing

As the phenomenon of outsourcing took hold it started to expand to different levels of the enterprise. Technology outsourcing started focusing on economy and productivity, moving away from efficiency (Kelly, 2004) as the primary criteria that were achieved by economies of scale. In order to save costs companies started outsourcing functions that was not perceived to be core business. This was also done to improve the financial status of functions (Handfield, 2006).



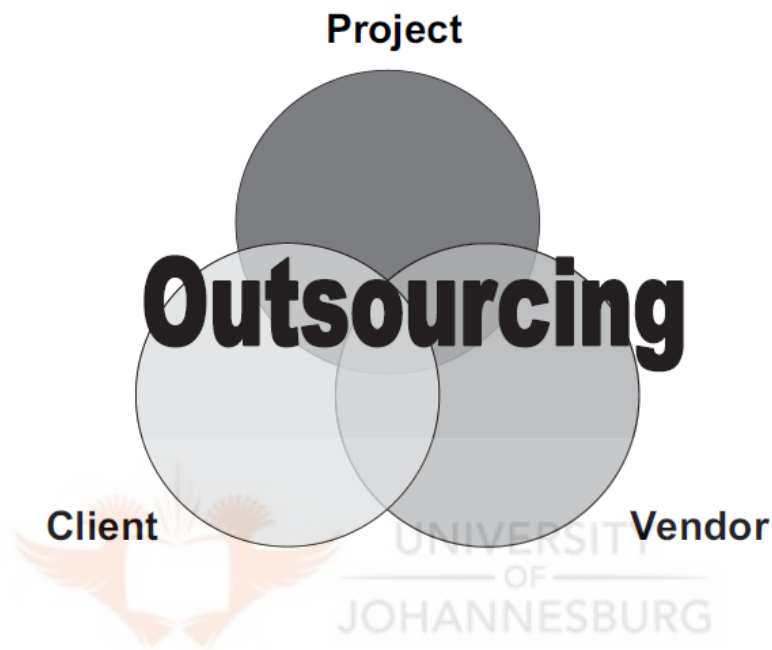
Outsourcing has since evolved to encompass all levels of the enterprise. Strategic partnerships are being developed between suppliers and users of services. Companies are now also outsourcing areas that were perceived as core business, such as customer service (Handfield, 2006). Another big growth area within the outsourcing arena is Business Process outsourcing, where total processes such as the human resources or payroll functions are managed by a service provider. This, however, does not fall within the scope of this research.

2.3 FUNDAMENTALS OF OUTSOURCING

Outsourcing can be seen as consisting of three components; the project, the client and the vendor (Power, Desouza & Bonifazi, 2006:3-4). The client is the entity that would like to

outsource a project. The vendor is the party that will take over the project and do the work. The project can be seen as the work, functions or services to be outsourced. Figure 2.1 shows the relationship between the three entities.

Figure 2.1 Components of outsourcing.



Source: Power et al. (2006:3).

All three components of outsourcing are interrelated, and as shown in figure 2.1, there is interdependence between the components. Even though services / functions can be outsourced, accountability for the effective working of the outsourced environment remains with the client.

2.4 INFORMATION TECHNOLOGY OUTSOURCING

The foregoing text has focused on general outsourcing and the components thereof. Information technology outsourcing is similar to any other form of outsourcing, with the exception that it is interweaved in almost every aspect of business. It is a pervasive facet

(OCD, 2002:2) of business processes, including marketing, manufacturing, finance and customer service delivery. In many cases technology is the enabler that provides the company with an advantage.

2.4.1 Service components of Information Technology

These are the functions utilised to support the information technology environment. Information technology areas that form part of the outsourcing options can be categorised broadly as follow (Fish & Seydel, 2006:98):

- applications development;
- applications management;
- data center operations;
- PC acquisition;
- PC maintenance [including desktop software and hardware support];
- systems development;
- systems maintenance;
- telecommunications/LAN; and,
- IT project management.

The research done for this dissertation excludes application development and maintenance, as well as the web environment and focuses on the services component of information technology.

Certain services within the information technology domain lend themselves to outsourcing without having to totally restructure the business environment. Helpdesk services, hardware and software support and desktop support (Cyber Futuristics, 2007), as well as network infrastructure support are areas which can be outsourced, managed and measured as separate

components. Other services, however, should not be outsourced. Services that are critical and differentiate the business should be kept in-house (Lacity & Willcocks, 2001:189).

2.4.2 Growth in Information Technology outsourcing

The growth of information technology outsourcing has been strong worldwide. It is estimated that 28% of all outsourcing is in the information technology domain (Cyber Futuristics, 2007). Research indicates that outsourcing will become the primary form of information technology delivery by 2012 (Core, 2007). This seem to be relevant to the South African market as well, as it is estimated that the information technology infrastructure outsourcing market have earned between \$ 2.78-billion and \$3.5-billion (US dollar) in 2006 and it is forecasted that this will grow to \$5.6-billion by 2012 (South Africa Gateway, 2007). This is an indication that many companies are looking for opportunities to outsource information technology functions.

2.5 VALUE OF OUTSOURCING

By outsourcing functions, a level of value should, and can be gained. If no value is gained, then the function should not be outsourced (Bendor-Samuel, 2001:26). Therefore, when deciding to outsource, it is vital that the entire environment is taken into consideration and that the value to be gained, be it financial, operational or strategic, be defined. Later in the chapter (see figure 2.2) a framework for making the outsourcing decision is presented that can assist in the process.

There are various advantages to be gained from outsourcing. Bendor-Samuel (2001:25) states that the most frequent reason to outsource is to reduce operating costs. But, as the move from

cost saving to outsourcing for strategic intent continues, other value propositions emerge. Other advantages that can be gained from outsourcing that have been identified by Handfield (2006) include:

- Staffing flexibility;
- Acceleration of projects and quicker time to market;
- High caliber professionals;
- Ability to tap into best practices;
- Knowledge transfer to permanent staff;
- predictable expenditures;
- Access to the flexibility and creativity of experienced problem solvers; and,
- Resource and core competency focus.

2.6 NEGATIVE ASPECTS OF OUTSOURCING

As with any business venture, deciding to outsource functions have, in addition to benefits, negative aspects and challenges. There are many reasons to outsource, and, if not handled correctly can prove to be costly and have serious repercussions for the business.

Companies that outsource aspects of information technology can lose control over the outsourced functions (Laudon & Laudon, 2002:326). It is therefore crucial to effectively manage any outsourcing function to ensure a successful relationship with the supplier.

Another facet that can affect an outsourcing relationship is when a company that want to outsource lack the expertise to negotiate a good contract. This could lead to higher costs and a loss of control over the technology direction (Laudon & Laudon, 2002:326), as the outsource provider may provide services as per the contract, but not to the level expected by the company. All aspects of the contract should be well thought out and expressly stated.

Examples of outsourcing not providing the expected results are plentiful. During the dotcom boom in the late 1990's, an outsourcing model (called ASP, or Application Service Providers) emerged. Outsourcing providers purported that they could run strategic functions remotely on their applications, and thereby providing companies with the expertise required. When many of these companies went bankrupt, customers were left without strategic services to run their businesses (Berkman, 2001).

It is important to ensure that the outsourcing contract is specific and fully encompassing. All functions to be outsourced should be specified, together with the level of service, what is included and, more importantly, what is excluded. If not done correctly, the cost of outsourcing could be higher than the benefits. Oates (2005) predicts that up to 2008, 60% of firms that outsource customer facing processes will not have any savings, and will face customer defections. Oates (2005) furthermore states that research by Gartner predict that 80% of projects that are intended to save money will fail to do so. Frauenheim (2003) adds that research shows that half of outsourcing projects do not deliver the expected value.

2.7 OUTSOURCING MISTAKES

When companies investigate the possibilities of outsourcing certain functions or processes care need to be taken. If it is not done in a responsible manner, and due diligence is not exercised, it can have serious consequences for the companies. It is important to ensure that the relevant expertise is available to consider all the alternatives into (Laudon & Laudon, 2002:326) and that, if the decision to outsource is taken, an indisputable contract is entered into.

The decision to outsource is a crucial choice and should not be taken without due consideration. It should be investigated by professionals and all relevant information should be considered. Unless a vendor is expressly appointed for the sole purpose to assist in the decision, a company considering outsourcing should not rely on a vendor's advice if he is also vying for the business (Baines, 2005:19). It cannot be certain that the vendor is providing impartial advice. Baines also warns against other mistakes that should be avoided, such as:

- not being complacent – e.g. significant staff changes at the supplier;
- not assuming saving money is the overriding benefit – other factors such as skills, your business focus and shorter project time should be taken into consideration; and,
- do not outsource a problem – it will remain an externally sourced problem.

Another important factor to take into consideration when contemplating outsourcing is that, if not managed effectively by the outsourced functions' owner, quality may suffer as a result. Staff that is transferred to the outsourcer from the company will have allegiance to the new company (Compass Consulting International, 2007). This may lead to a predicament when previous managers still expect the staff to pay attention to them.

A mistake that is often made when outsourcing is to see it as a once-of arrangement. When outsourcing information technology it is especially important to realise that requirements may change over the period of the contract. To ensure that the company does not enter into a contract that will not allow them the flexibility to address changing technological needs, it is vital that planning for the future is done before entering into the agreement, and that the agreement accommodate the effective negotiation of necessary changes.

2.8 OUTSOURCING AND MANAGEMENT DISCIPLINES

Outsourcing cannot be seen as a decision that is taken in isolation. It has different aspects and the decision to outsource can be made for a number of reasons. Cyber Futuristics (2007) mentions the following reasons why companies outsource:

- To reduce costs and internal staffing commitments;
- To release capital to more productive uses;
- To gain access to specialized expertise; and,
- To establish or strengthen strategic business relationships.

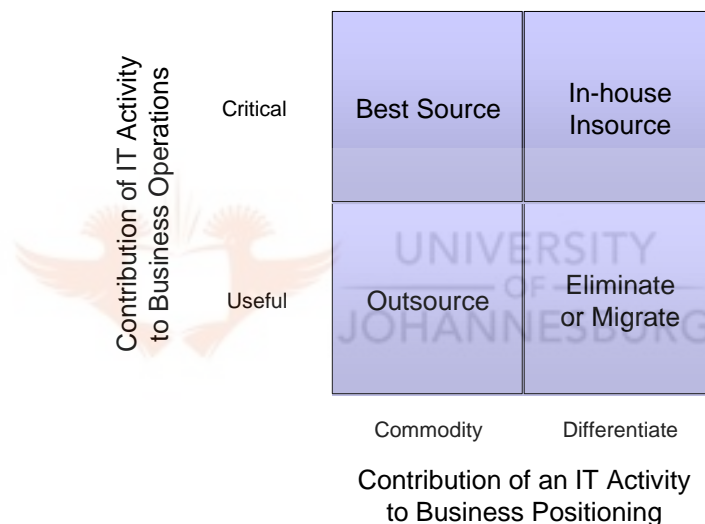
These reasons were also found to be amongst the primary reasons stated by The Outsourcing Institute (Casale, 2005). As can be seen, it covers areas such as finance, human resources, operations and strategy. According to Pati and Desai (2005:288), the 'main objective of deploying IT systems is to support organizational processes in order to create operational, tactical, and strategic business values for the organization'. Depending on the reasons to outsource, one or more of the management disciplines will play a role in the decision. Since operational functions are mostly involved when outsourcing, the discipline of operations will not be discussed in this dissertation. Furthermore, only the primary disciplines that will be affected are discussed.

2.8.1 Strategy

Although technology has been recognised as an important element of competitive strategy since the 1980's (Burgelman, Maidique & Wheelwright, 2001:6), according to Mullin (1996:29) it was only in 1989 that outsourcing was formally identified as a business strategy.

When considering the outsourcing of the technology environment, it cannot be seen as an all or nothing approach, either strategic or not. The functions and services should be analysed and categorised before the decision is taken whether to outsource it or keep it in-house (Lacity & Willcocks, 2001:186). Lacity and Willcocks proposes a ‘business factors matrix’, shown in figure 2.2, that can assist in the decision making process by placing these functions and services in quadrants and allowing the business to decide on components of the overall environment.

Figure 2.2 The Business Factors Matrix.



Source: Lacity & Willcocks. (2001:188).

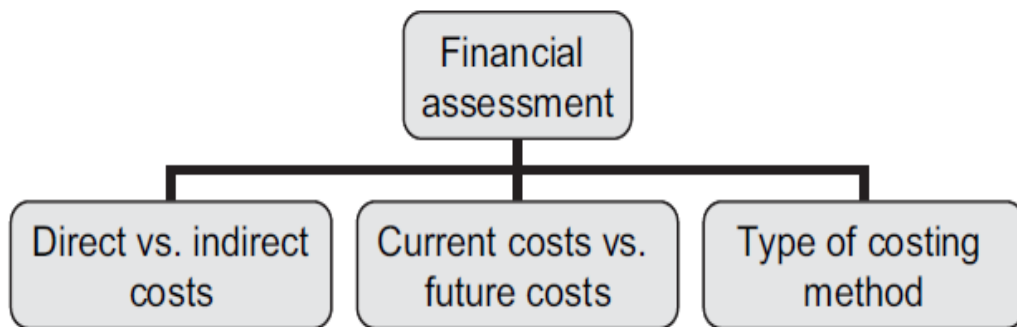
Based on the matrix, Lacity and Willcocks argues that functions or services that falls in the bottom left quadrant can be easily outsourced, while those falling in the top right quadrant should be kept in-house or insourced if already outsourced. The functions within the remaining two quadrants should be investigated, and can be in- or outsourced, based on the strategic relevance and value (Lacity & Willcocks, 2001:188-190).

2.8.2 Financial

The decision to outsource is, in many cases, taken to save money (Power et al., 2006:57). However, it is important to do a financial assessment to determine the true cost of processes and services in order to establish where, and if, outsourcing will provide a cost saving. Power et al. (figure 2.3) describes the costs that play a role and that should be looked at. An important area of cost that may be overlooked is the current versus future cost. When investigating the possibility of outsourcing, the company should have a clear understanding of what will be required for the foreseeable future. If there are significant changes after entering into an outsourcing agreement, the initial cost-saving can be negated. It may be required to renegotiate the agreement, which may place the outsourcer at an advantage, as the outsourced company will in all probability not have the skills to provide its own service if they end the agreement.



Figure 2.3 Elements of financial assessment.



Source: Power, et al. (2006:58).

Information technology functions are a specialised environment and require considerable investment in technology, resources and skill development. Outsourcing these functions can

result in a cost saving for the firm (Cyber Futuristics, 2007), and this is why outsourcing for cost saving is one of the top reasons why firms outsource (ITToolbox, 2003).

2.8.3 Human resources

Any outsourcing initiative that is embarked on will involve human resources. The impact it has will depend on the level of outsourcing and whether internal staff is directly involved in the process. If the outsourcing arrangement involves the transfer of staff to the outsourcer, the impact can be severe. Conversely, if services are being outsourced that are not currently being done by internal staff, the impact can be infinitesimal.

Dominguez (2006:35) states that organisations often underestimate the value of their employees, thereby also underestimating the impact that human resources have on the success of the outsourcing arrangement.



Research indicates that, when outsourcing, there is the risk that performance may be negatively impacted due to low morale amongst employees (Mcaulay, Doherty & Keval, 2002:246). If not managed carefully, it can also lead to high staff turnover (Mcaulay *et al.* 2002:249).

2.9 CONCLUSION

The outsourcing environment is complex and, if care is not taken, can lead to costly mistakes. Technology outsourcing have been used to provide an advantage within the business environment since the early 1960's, and is still evolving and changing as the requirements for services change. Therefore it is important for any prospective outsourcer to ensure that they

fully understand the requirements of the environment or service to be outsourced in order to make the correct assessment.

When deciding to use outsourcing as an option within the business environment all aspects of the management disciplines involved are important. None of the factors can be ignored, as this will have an effect on the final decision. Although many mistakes have been made regarding outsourcing, it does provide a strategic alternative for businesses that have the need to optimise areas of service delivery within the environment.



CHAPTER 3

THE SOUTH AFRICAN PUBLIC SECTOR HIGHER EDUCATION TECHNOLOGY ENVIRONMENT

3.1 INTRODUCTION

This chapter provides the background to the South African public Higher Education environment and the technology that is in use in this environment. It is not intended as an exhaustive history of the South African Higher Education environment, and provides background information for the purpose of the study. The technology environment, obtained as part of the questionnaire, forms the primary component.

3.2 EVOLUTION OF THE HIGHER EDUCATION ENVIRONMENT

The higher education environment in South Africa has been closely tied to the political environment of the country. Since the first university was established in the early 20th century, it has been used to create differentiation, at first between British and Afrikaner nationalism, and later between the black and white populations (Subotzky, 2007).

When the National party became the dominant political party and came into government power in 1948, there were 10 institutions funded by government, four which were Afrikaans, four that lectured in English, one bilingual correspondence University, and a 'Native College'. In 1959 an act was passed that prohibited black students in universities, except with permission from a cabinet minister (Coutsoukis, 2004).

The government then established several universities that were for 'non-white' students. These students were only allowed to study at a historical white university if the 'non-white' universities were too overcrowded. It also established a number of technikons (advanced level technical training) during the ensuing years (Coutsoukis, 2004). Through the establishment of these institutions, the South African Public Higher Education environment grew to 21 universities and 15 technikons by the late 1980's (Subotzky, 2007).

After the abolishment of apartheid in the 1990's, the ANC government that came into power in 1994 started to look at restructuring the Higher Education landscape to redress the inequalities that existed. In 1995 the president established a commission to investigate the Higher Education environment (Government Gazette, 1997:3), which led to the publishing of a white paper (A Programme for Higher Education Transformation) in 1997. The white paper introduced a set of initiatives for the transformation of Higher Education.

A national working group was established by the Minister of Education in 2001 to advise on the restructuring of the Higher Education environment (Ministry of Education, 2002:1). Proposals were put forward by this working group to merge several institutions in order to consolidate higher education provision on a regional basis (Ministry of Education, 2002:3). A number of the proposals were accepted, with the Ministry of Education providing additional proposals (Ministry of Education, 2002:9-12).

The proposals of the Ministry of Education were implemented from 2002. This led to the reduction in institutions from 36 to 23. There were three categories of institution; former technikons were renamed to Universities of Technology, with Universities remaining the same and, in situations where universities and technikons were merged, comprehensive institutions were established. The mergers of the various entities were effected between 2002

and 2005, but the institutions that were affected by mergers are still in the process of restructuring their environments.

3.3 THE INFORMATION AND COMMUNICATION TECHNOLOGY ENVIRONMENT OF PUBLIC HIGHER EDUCATION

The information technology environment of the South African public higher education sector consists of a diverse range of technologies, as will be shown in the ensuing information presented in this chapter. In many cases this is as a result of the mergers, but this situation also exists in universities where mergers did not take place.

As part of the research into outsourcing within public higher education, a technology survey was also conducted. This was done to determine if there are any areas where outsourcing can be implemented due to economies of scale, and if any value can be gained from standardisation. The results are based on replies received from 16 of the 23 institutions (70%). The remainder of this chapter provides the results of the survey.

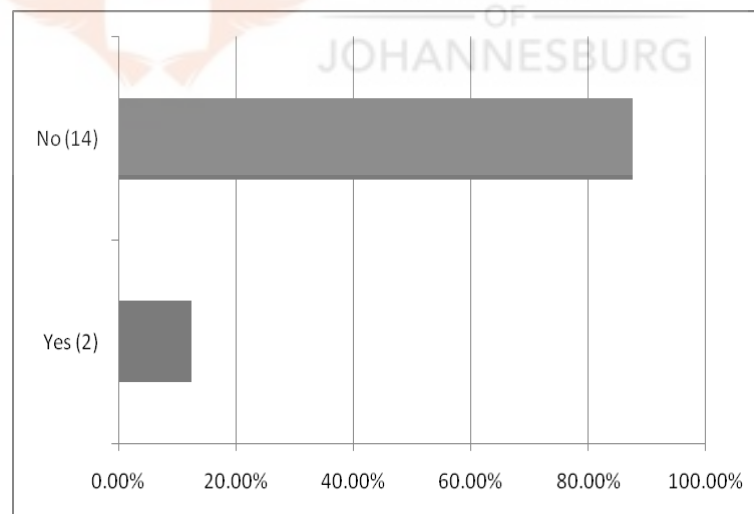
3.3.2 Technology

The technology environment of the South African Higher Education environment is complex. There is a need for a variety of technologies to provide the necessary services to a diverse blend of users. The information provided by the respondents for this section is grouped in high level groupings that include similar technology.

3.3.1.2 Computers and servers

There is a vast variation between the numbers of computers within the institutions. It varies from 1100 computers in an institution to 15 500 in another. No correlation could be found between the size of an institution and the number of computers within the institution. Large institutions with students in excess of 40 000 and staff between 4 500 and 6 000 had varying numbers of computers, with one institution having 4 500 computers, and the other 15 500. Similarly, the number of computers at small institutions with less than 10 000 students varied between 1 100 and 2 800. The number of file servers within the institutions has a similar variation, ranging from 14 to 170. Again, apart from the fact that larger institutions have more file servers than the smaller institutions, no correlation within groupings could be found.

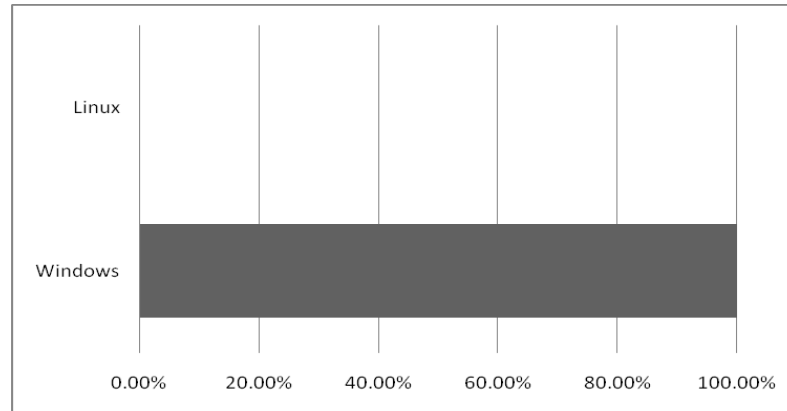
Figure 3.1 Mainframes in use.



Although there are still mainframes in use at some of the institutions (see figure 3.1), it is not prevalent. From the respondents only two are using a mainframe within their environment. The researcher is of the opinion that, with the small number of mainframes in use, outsourcing these will not have significant value, and therefore will not put any focus on this.

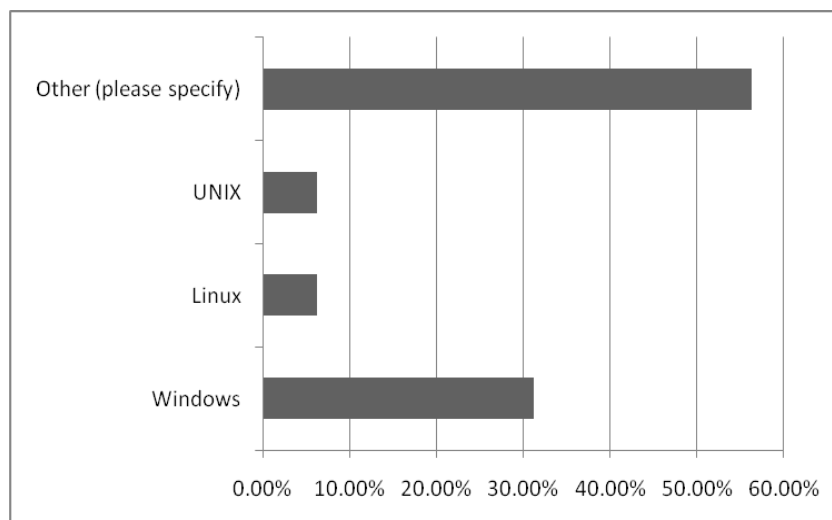
3.3.1.2 Operating systems

Figure 3.2 Primary desktop operating system.



The desktop operating system is the software in use on desktop computers used by the institutions. The primary desktop operating system in use at the institutions remains Windows (as seen in figure 3.2). No respondent indicated that they are using any other operating system as their primary system. This presents an opportunity for outsourcing or closer collaboration between institutions as the focus is the same for the desktop environment.

Figure 3.3 Primary network operating system.



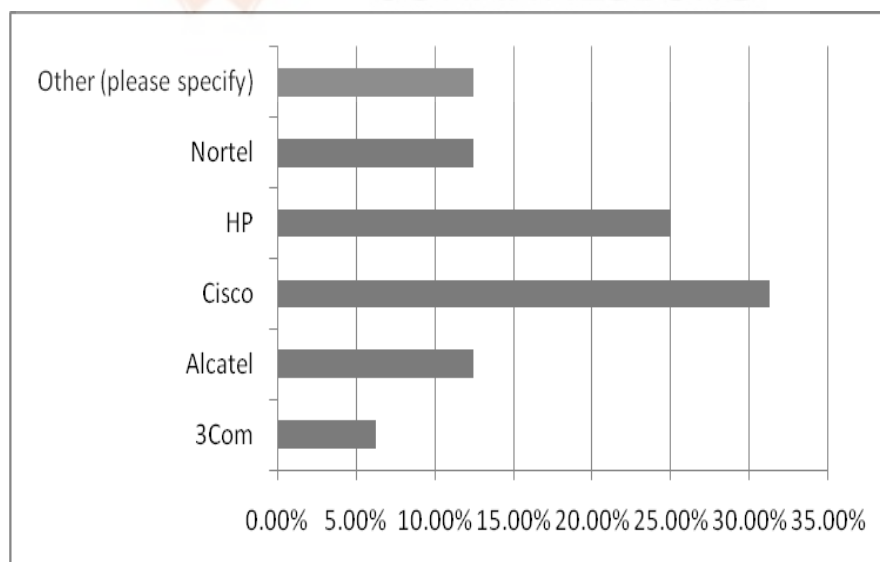
The network operating system is software used on file servers that are situated within the institutions. Within the constraints of this dissertation, network operating systems used on

switches, such as Cisco's IOS, are excluded. An interesting statistic that emerged from the research is that the Netware operating system from Novell (indicated in figure 3.3 as 'Other') is still the most popular system and is in use in 56.25% of the institutions. This is in contrast to world trends where Windows is the leading operating system.

3.3.1.3 Network environment

As with the number of computers within the institutions, the number of switches used within institutions varies significantly, and no correlation between institutional size and the number of switches exist. This may be as a result of different design philosophies, campus layouts (e.g. remote campuses) or equipment design. The researcher's interest in the number of switches is to establish if economies of scale can present opportunities for co-sourcing.

Figure 3.4 Primary network equipment.

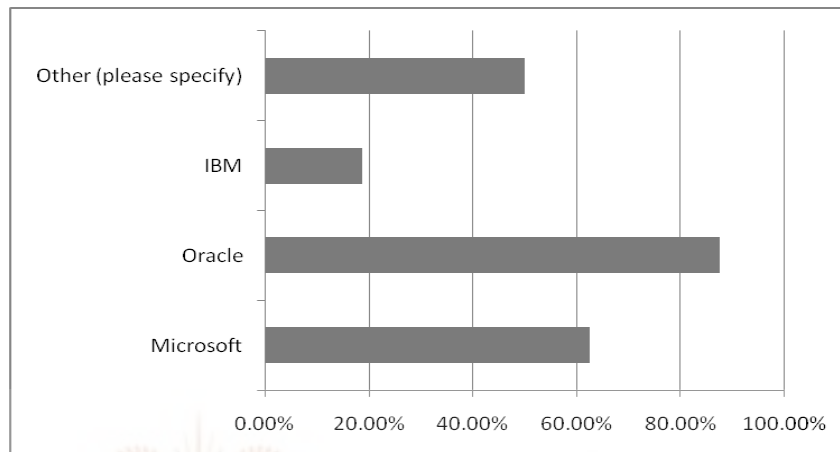


The network equipment provider that is being used most is Cisco (see figure 3.4), being used at 31.25% of respondents. HP follows with 25% share, and Alcatel, Nortel and Other (Extreme and Dlink) are tied in third place with 12.5% respectively. With the mix of

equipment in use at the institutions, an opportunity exists for consolidation of service provision.

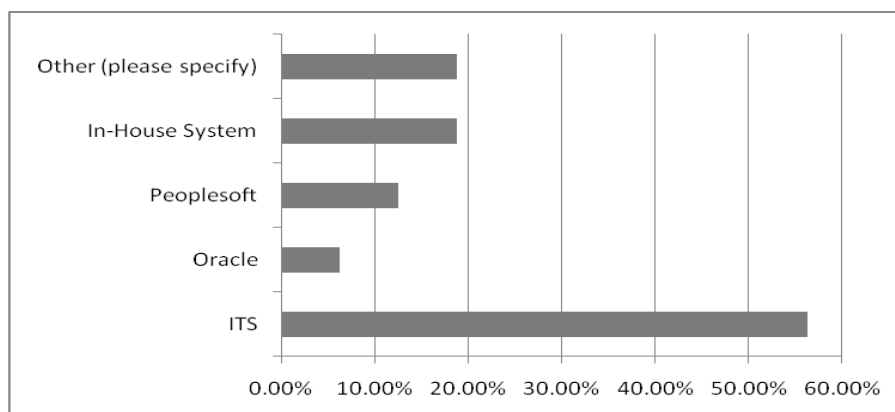
3.3.1.4 Enterprise systems

Figure 3.5 RDBMS in use at institutions.



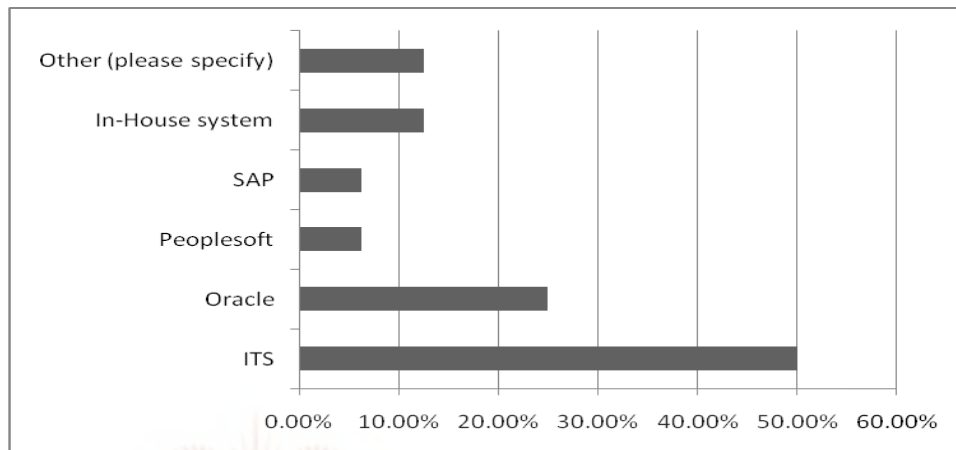
The databases that are in use within the institutions vary. Oracle is in use at most of the institutions (87.5%) (shown in figure 3.5), but Microsoft SQL Server is also prevalent. When analysing the category of 'Other', MySQL is used by 31.25% of institutions. A contributing factor to the high use of the Oracle database is the fact that ITS is used by most institutions, and that ITS utilise the Oracle database.

Figure 3.6 Student systems in use.



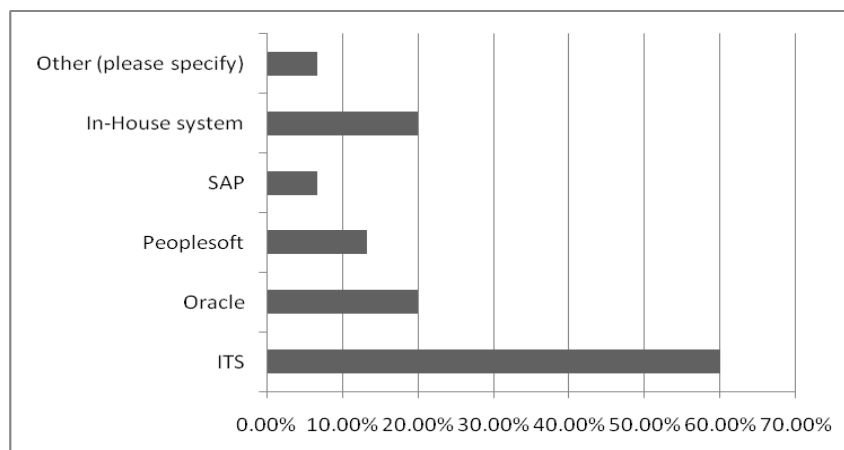
The primary student administration system (figure 3.6) in use at the majority (56.25%) of responded institutions is ITS, a South African developed and supported system. Systems developed in-house have the second highest prevalence. Other systems also in use are the Varsite Student System, Moodle, and Zimbra.

Figure 3.7 Financial systems in use.



The ITS system is also the most used financial system within the institutions surveyed (figure 3.7), with 50% of the respondents indicating that they are using it. Within this category Oracle follow with 25% usage. Other financial systems in use are Navision and Omnix.

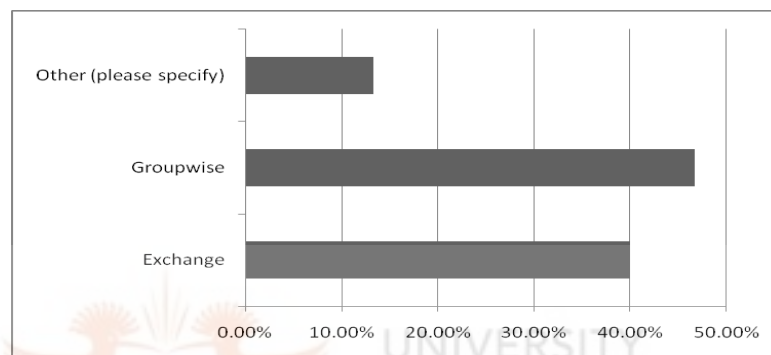
Figure 3.8 Administration systems in use.



Again, the ITS system is the most used (60%) general administration system within the respondent institutions (shown in figure 3.8). Oracle and in-house own developed systems are both used at 20% of the institutions. Other systems in use include ‘Residence Management System’ and Syllabus+.

3.3.1.5 Collaboration systems

Figure 3.9 Primary collaboration systems in use.



Collaboration systems are used for sending and receiving email, calendaring functions such as arranging meetings and other methods of communicating information within the institutions and with 3rd parties. The primary collaboration system used at the institutions is Novell’s GroupWise (see figure 3.9), with 46.67% of respondents indicating the use thereof. Microsoft Exchange is in use at 40%, while Scalix, an Exchange clone, is in use at 1 institution. One institution indicated that no collaboration system is in use. The prevalence of GroupWise within the institutions is contrary to worldwide trends, where Microsoft Exchange is the most common collaboration system, with Lotus Notes, which is not used by any of the institutions, following in second place (The Radicati Group, 2005:18).

3.3.2 Financial

Sixty nine percent (69%) of the respondents to the questionnaire indicated that when the Information and Communication Technology annual budget is segmented between staff, technology and operations, the staff component consume the largest part of the budget. The technology and operational aspects of the Information and Communication Technology environment varies between institutions, with seven institutions indicating that operations have a higher budget than technology expenditure. Information and Communication Technology expenditure as a percentage of total institutional budgets varied between 3% and 7%.

When asked if the annual Information and Communication Technology budget increased or decreased during the period 2004 – 2008, the statistics indicate that, although most of the institutions' Information and Communication Technology budgets have increased over previous years, there is a steady decline in the number of institutions that have budget increases (Table 3.1). More institutions now indicate that year-on-year budgets are remaining the same. For the first time, in the forecasted period of 2007 – 2008, more institutions indicate that the budgets will remain the same and not increase. It is also interesting to note that, contrary to previous years, no institution indicated in the forecast that their budget have decreased.

Table 3.1 Annual budget increase – decrease.

Budget Period	Increased	Same	Decreased
2004 – 2005	62.50%	31.25%	6.25%
2005 – 2006	56.25%	31.25%	12.50%
2006 – 2007	56.25%	25.00%	18.75%
2007 – 2008 (forecast)	46.67%	53.33%	0.00%

The questionnaire asked the opinion of the heads of the information technology departments whether the budget for the various segments (staff, technology and operations) were adequate to provide the expected level of service to the institution. In Table 3.2 the responses are provided. The majority of respondents (87.5%) indicated that funding for staff is inadequate, while there was a marginal difference for the other two segments.

Table 3.2 Adequate budget.

Segment	Yes	No
Staff	12.50%	87.50%
Technology	53.33%	46.67%
Operations	46.67%	53.33%

3.3.3 Operational



As with the number of computers and file servers, there is no statistical correlation between the size of the institution and the number of Information and Communication Technology staff. The larger institutions generally have more staff than the smaller institutions, but there are also small institutions with more staff than large institutions. With the exception of one institution, all institutions primarily make use of their own staff, with contract staff being in the minority.

The variance in staff with relation to institutional size could be ascribed to a range of factors. The complexity of the environment, the existence of satellite campuses, different levels of service provision and the merger of various institutions may play a role. More research needs

to be done to determine the factors that play a role, but it is not within the scope of this dissertation.

Table 3.3 Service level agreements in place.

Service level agreements.	
Yes	31.25%
No	68.75%

The majority of respondents indicate that no service level agreements are in place between the Information and Communication Technology department and the rest of the institution (table 3.3). It is therefore difficult to determine a baseline for service delivery across institutions.

Responding institutions indicated that the most important systems are their administration systems, used for student administration, financial administration, human resources and general administration. Other important systems indicated are email, the network infrastructure, authentication (security), the Library system, collaboration / email systems and learning management system. The diversity of systems indicated as most important to the institutions is an indication that there are a variety of areas that have different focus levels at the institutions.

CONCLUSION

The Higher Education environment in South Africa has changed extensively during the last five years. The mergers of certain institutions have created entities with mismatched technologies as well as the challenges of merging disparate systems. This is placing pressure on the technology support environment. A major challenge for these institutions is to consolidate technology to simplify the environment, while at the same time ensuring that they

do not stagnate. This challenge can be changed to an opportunity if the consolidation process is utilised as a renewal option.



CHAPTER 4

OUTSOURCING IN SOUTH AFRICAN PUBLIC HIGHER EDUCATION

4.1 INTRODUCTION

In chapter two the different facets of outsourcing was discussed. The focus was on outsourcing in general, with relevance to the information technology sector. The facets of outsourcing as it relates to the different management disciplines were discussed. In chapter three the technology environment of South African public Higher Education sector was presented. The information provided was received from the institutions that participated in the research. The research information gained by questionnaire and presented in the previous chapter provides a basis for the information presented in this chapter.

This chapter focus on the information technology outsourcing environment as it exist in South African public Higher Education. Furthermore, it establishes the relevance of the outsourcing environment as it relates to international surveys conducted, and gauges the sentiment regarding outsourcing of the information technology heads of these institutions.

4.2 METHODOLOGY

In order to establish the level of outsourcing within the relevant institutions, an electronic questionnaire was distributed to all the institutions. The questionnaire consisted of two primary components, the technology survey, conducted to gain a better understanding of the environment, and the outsourcing questionnaire that established the level of outsourcing. A third section, which does not form part of this dissertation in order to preserve the privacy of respondents, was used to identify the respondents and their respective institutions.

The questionnaire consisted of structured and unstructured questions (see annexure A). Where more information was required to clarify answers provided, unstructured questions were used. The questionnaire was distributed to the Information Technology principals, either the CIO or Information Technology director, of all 23 public higher education institutions. One institution indicated that it did not wish to partake in the survey. A total response of 70% was received. Where further or additional information is provided, the percentage of respondents for the responses is presented in brackets after the response.

Chapter three described the technology environment and the background to the current higher education environment. It is important to understand the environment and background within which the research was done. This provides the milieu for recommendations that are made in chapter five.

4.3 QUESTIONNAIRE RESPONSES

The responses to the questionnaire are categorised according to the relevant area of the research that it is directed. The first question was structured to gauge if a level of differentiation exists between international reasons for outsourcing technology services and the South African higher education environment. The respondents were asked to rank the 10 primary reasons provided on a scale of 1 – 10. The responses are listed in table 4.1.

Table 4.1 Reasons for outsourcing.

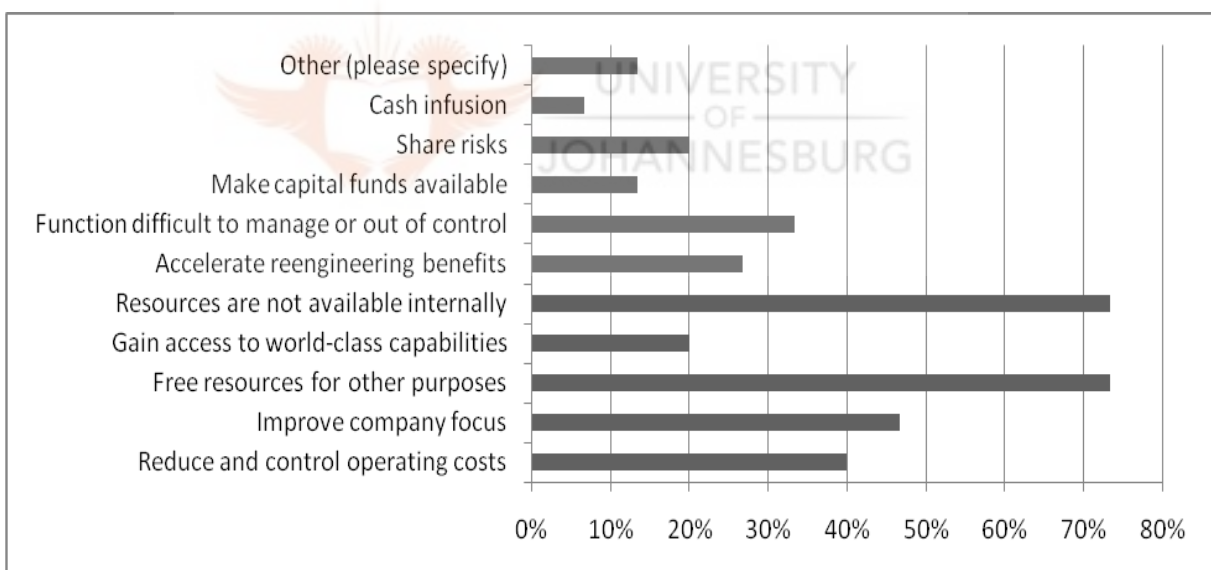
Ranking	Reasons for outsourcing
1	Free resources for other purposes
2	Resources are not available internally
3	Gain access to world-class capabilities
4	Improve company focus
5	Accelerate reengineering benefits
6	Reduce and control operating costs
7	Share risks

Ranking	Reasons for outsourcing
8	Function difficult to manage or out of control
9	Make capital funds available
10	Cash infusion

Based on the reasons provided, the next question was structured to determine which of these reasons would strategically influence the respondents' decision if considering outsourcing services under their control. Figure 4.1 provides the responses. Additional reasons provided that would influence the decision to outsource are:

- to resource urgent strategic projects; (6%) and,
- To negate the risk of skills seated in a single individual (6%).

Figure 4.1 Strategic considerations when outsourcing services.



To determine the level of technology outsourcing within the institutions, a list of services were provided and respondents were requested to indicate whether the services were outsourced or not. Additionally, respondents indicated if services that were outsourced were fully or partially outsourced. The number of respondents are indicated in each of the categories.

Table 4.2 Outsourced services.

Services	Outsourced		No Response	Level of Outsourcing	
	Yes	No		Full	Partial
Software maintenance and support	75%	19%	6%	16.7%	83.3%
Hardware maintenance and support	69%	12%	19%	27.3%	72.7%
Training	56%	32%	12%	22.2%	77.8%
Management services	6%	82%	12%	-	100%
Printing	38%	56%	6%	16.7%	83.3%
Network support	32%	56%	12%	-	100%
Network management & operations	25%	63%	12%	-	100%
Database services & operations	50%	44%	6%	12.5%	87.5%
Technology procurement	-	88%	12%	-	-
Helpdesk	6%	82%	12%	-	100%
Telecommunications	12%	69%	19%	-	100%

Based on the previous question and the services that were outsourced, respondents were asked to provide reasons for outsourcing the services to determine the drivers of their outsourcing initiatives. The reasons provided are:

Software maintenance and support:

- Project roll out (6%);
- Accelerate re-engineering benefits (6%);
- 3rd Party software used (6%);
- ITS (the company) maintains software (19%);
- Insufficient internal resources (13%);
- Strategic decision (6%);
- To manage risk (6%);
- Specialised software (6%);
- Skills shortage; and (19%),
- Applications need developer support (6%).

Hardware maintenance and support:

- Covered by procurement contract (6%);
- Lack of skills (6%);

- No internal function (6%);
- Hardware warranties cover maintenance (6%);
- Not a focus area (6%);
- Specialised hardware (19%);
- Manage risk; and (6%),
- Access to world class capabilities (6%).

Training:

- Specific skills training done externally (6%);
- Elementary training done in-house only (6%);
- Makes financial sense (6%);
- Supplement internal resources (6%);
- Specialised training outsourced; and (13%),
- No skills internally (6%).

Management services:

- Contract management etc. cost less (6%).

Printers

- Have institutional contract with vendor (6%);
- Photocopying cost less (6%);
- Centralised large-volume printing more cost effective (6%);
- Specialist operation and it makes financial sense (6%);
- Low service levels (6%);
- Difficult to manage/control; and (6%),
- Expertise required (6%).

Network support:

- Specialised knowledge required; and (13%),
- Skill shortage (13%).

Network management & operations:

- No internal skills (6%);
- Access to technology partners; and (6%),
- Level 3 network support outsourced to specialists (6%).

Helpdesk:

- Low service level; and (6%),
- Difficult to manage / control (6%).

Database services & operations:

- Dependent on external vendor for support on Oracle (13%);
- Inadequate Oracle DBA skills (6%);
- Lack of in-house skills and capacity (6%);
- Specialised knowledge required; and (6%),
- Auditor recommended (6%).

Telecommunications:

- Specialised knowledge required; and (6%),
- No internal skills (6%).

Other:

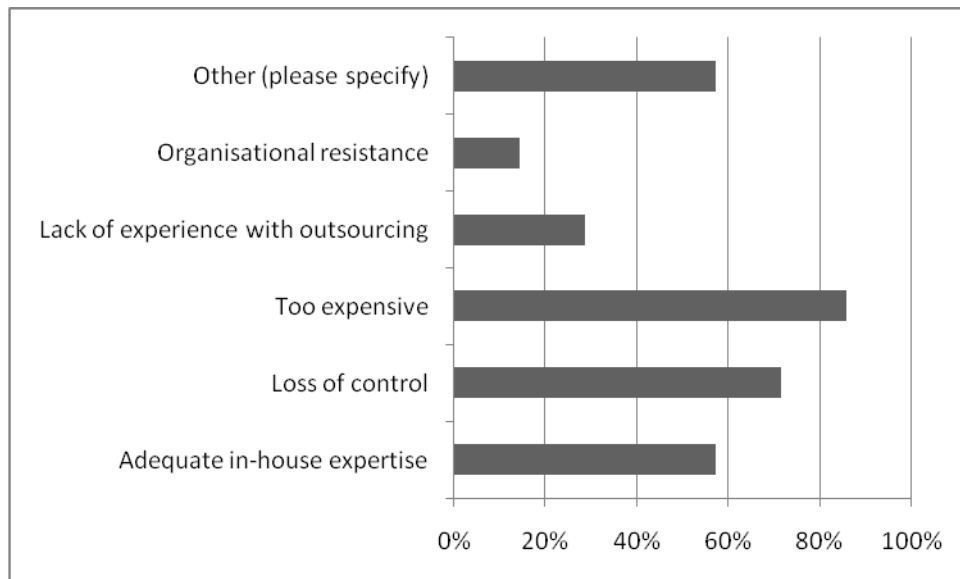
- Not a core function of Information and Communication Technology (This relates to cabling) (6%).

Respondents that do not outsource services were requested to provide reasons why. The results are presented in figure 4.2. In the category 'Other' additional reasons provided were:

- It is strategic elements of our infrastructure (6%);
- Complexity of user environment at a university (6%);
- Limited enforceability (6%);
- A perception that those who outsource have one foot in the third world; and (6%),

- Difficult to find vendors with reasonable expertise (6%).

Figure 4.2 Reasons for not outsourcing.



To determine if respondents are planning to outsource services, they were requested to provide information regarding planned outsourcing of services within the next two years (shown in table 4.3).

Table 4.3 Outsource planning for next two years.

Services	Planning		No Response	Level of Outsourcing	
	Yes	No		Full	Partial
Software maintenance and support	38%	38%	24%	-	100%
Hardware maintenance and support	38%	24%	38%	-	100%
Training	31%	38%	31%	20%	80%
Management services	19%	62%	19%	-	100%
Printing	19%	57%	24%	-	100%
Network support	31%	57%	12%	-	100%
Network management & operations	25%	50%	25%	-	100%
Database services & operations	25%	50%	25%	-	100%
Technology procurement	-	81%	19%	-	-
Helpdesk	6%	75%	19%	-	100%
Telecommunications	24%	38%	38%	20%	80%

Next, respondents that do not outsource, and do not plan to outsource, were asked to provide conditions under which they would consider outsourcing. One respondent indicated that they would not outsource, as they have the capacity to manage most of the resources. The other responses were:

- If it was cost-effective; and (6%),
- If there were reliable vendors available (6%).

To determine the perceived risks of outsourcing within the higher education sector, respondents were requested to indicate their agreement or disagreement with statements on a five point scale. The questions is an adaptation of risks identified by Mcaulay *et al.* (2002:249) of stakeholders in a large outsourcing contract. The results are presented in table 4.4, with the number of respondents in each category.

Table 4.4 Risks of outsourcing

Risks	Totally disagree	Somewhat disagree	Neutral	Somewhat agree	Totally agree	No Response
Vendor opportunism	-	-	25%	44%	25%	6%
Lack of flexibility	-	-	25%	38%	31%	6%
Loss of intellectual property	-	-	38%	25%	25%	12%
Financial stability of the vendor	-	-	31%	44%	19%	6%
Lack of active management of the vendor	-	6%	26%	31%	31%	6%
Over-dependence on the vendor	-	-	12%	25%	57%	6%
Vendor's lack of knowledge of the client	-	6%	6%	31%	51%	6%
Treating IT as a commodity	-	6%	38%	25%	25%	6%
Lack of employee morale	6%	6%	25%	32%	25%	6%
High staff turnover	-	25%	19%	38%	12%	6%
Loss of expertise within client	-	6%	12%	32%	44%	6%
Vendor failing to provide contracted service to the required level	-	-	19%	44%	31%	6%
High costs of controlling the vendor	-	-	31%	25%	38%	6%
Escalation of costs	-	-	25%	31%	38%	6%
Lack of attention to retained IS employees who can affect the client-vendor relationship	-	6%	32%	44%	12%	6%
Rushed consultation causing operational problems during transition (poor performance/morale)	-	-	25%	38%	31%	6%
Multi-vendor outsourcing	6%	-	31%	31%	26%	6%
Lack of attention to business needs during consultation causing strategic misalignment	-	-	38%	44%	12%	6%

Risks	Totally disagree	Somewhat disagree	Neutral	Somewhat agree	Totally agree	No Response
Client not understanding what is being outsourced	-	-	38%	25%	31%	6%
Mismatch of client/vendor culture causing conflict of interest	-	6%	19%	31%	38%	6%
Outsourcing parts of IS, leading to fragmentation and loss of control/focus	6%	-	25%	38%	25%	6%

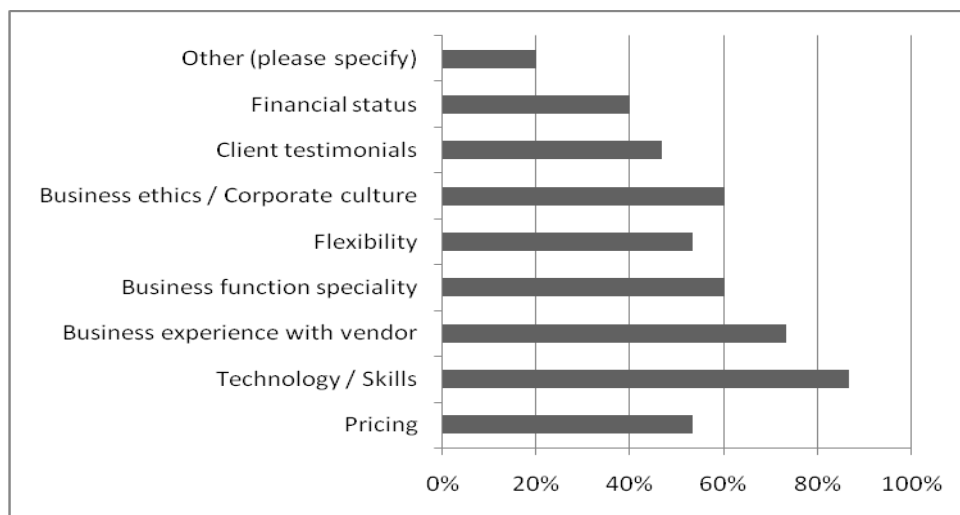
Respondents were also asked to provide additional risks that were not represented in the table.

Two additional risks identified were:

- Vendors negotiate skill level provision, but the actual people being placed does not have the skills to do an effective job; and (6%),
- Vendors falsely claim to have skills but end up being ‘box-droppers’ (6%).

To determine which factors were important when selecting an outsourcing provider, a list of options were provided to the participants (ITToolbox, 2003), as well as the opportunity to add additional criteria. Results are presented in figure 4.3.

Figure 4.3 Criteria for selecting outsourcing provider.



Additional criteria presented from the respondents are:

- Provider responsiveness; and (6%),
- Reputation of company (6%).

To determine if there are differences, or perceived differences, between the public higher education ICT environment and the private sector, the question was posed to the participants, and they were requested to provide reasons if they responded positively. Of the respondents, 81.25% thought there were differences, with 12.5% stating that there were no differences. 6.25% did not have an opinion on the question. The reasons provided were:

- Executive Management's focus is academic which includes concepts of academic freedom which may not always result in a cost effective solution from an operational perspective (i.e. standardisation of processes and equipment) (6%);
- Chief Executive Officers' priorities in the corporate environments'(including purpose and drive) differ from the Higher Education's senior executive group (Profit making being a determining factor in the former). This culture has a ripple effect which has the ability to stranglehold Information and Communication Technologies as it is not always seen as a business enabler (6%);
- Very complex for size (13%);
- Internal risk due to students within safety perimeters (6%);
- Operational cost is higher in respect to the licensing vs. capital/innovation expenditure (6%);
- Different focus than corporate (13%);
- Institutions generally provide a much wider spectrum of services, to a very diverse client population (13%);
- The institutional culture at a university is significantly different from the private sector. There is less accountability and users insist on freedom of action beyond academic freedom (19%);
- IT Governance of end users is difficult to enforce and in many cases the users are able to bypass policy without being at risk of disciplinary action (6%);
- Teaching, learning and research require a flexible enabling environment (6%);

- University administration does share some similarities with the corporate sector (13%);
- Different pricing structures are needed (6%);
- Different system setups to cater for the educational needs (6%);
- Institutions are more patient. Are able to deal with more problems than industry (6%);
- Errors as part of the knowledge build-up (6%);
- Working with multiple vendors and technologies (6%);
- Universities are not profit driven (6%);
- Universities - supposedly - do things in advance of the private sector (6%);
- There are different reporting/statutory requirements than the private sector (6%);
- The financial drivers are different (6%);
- The academic/teaching-and-learning support side is very different from the IT management problems in industry; and (6%),
- The attempt to see Information and Communication Technologies as an enabler and an experimental domain is suspected to be unique to higher education (6%).

In addition to the outsourcing environment, the research also attempted to determine if co-sourcing, either between institutions, or between institutions and other entities, were a viable option within the higher education environment. Respondents were asked to provide reasons for their responses. Of the respondents, 56.25% responded positively, with 37.5% not believing that it will provide value, and 6.25% not providing a response. Proponents of co-sourcing provided the following reasons:

- Outsourced companies are not directly involved in internal politics, hence this is removed from the equation (6%);
- The focus of outsourced companies is service delivery (6%);

- It could work if sufficient skills remain in-house to be able to manage the contract, and it could complement scarce skills (6%);
- Co-sourcing allows the very particular and specific needs of the university environment to be catered for (6%);
- It could provide more power to bargain (6%);
- Sharing of skills (6%);
- Reconciling focus and strategic direction (6%);
- It is a win-win situation. The institution gains experience quickly and the vendor has internal backup on deployed solutions (6%);
- It could be used as a gap-fill measure while staff is retrained and new skills acquired; and (6%),
- Knowledge is imparted in a more balanced way (6%).

Opponents of co-sourcing provided the following reasons:

- The most important element of success is the quality and loyalty of internal staff (6%);
- There is a rather huge skills shortage in South Africa; and (6%),
- There is not sufficient, reliable on-going support available (6%).

A final question was added to the survey to determine if there are areas that can be identified for possible outsourcing or co-sourcing within the higher education technology environment. The questions were adapted from a self-assessment questionnaire developed by Alphawest (n.d.). The results are presented in table 4.5, with the number of respondents in each category.

Table 4.5 Assessment of possible outsourcing areas.

Statement	Totally disagree	Somewhat disagree	Neutral	Somewhat agree	Totally agree	No Response
Users of our current Information Technology component are satisfied with the level of service that they receive.	-	31%	38%	25%	-	6%
We keep up-to-date with the latest Information Technologies.	-	12%	38%	38%	6%	6%
We have high staff turnover.	19%	25%	12%	38%	-	6%
Support staff has the skill depth required to solve all Information Technology problems.	6%	32%	6%	38%	12%	6%
We are pro-active in solving problems.	-	25%	19%	44%	6%	6%
We are reactive in solving problems.	-	32%	25%	25%	12%	6%
Support staff has limited career options.	6%	6%	12%	58%	12%	6%
When Information Technology staff members is on leave the standard level of service deteriorates.	6%	19%	6%	38%	19%	12%
We have measures in place to assess the efficiency and effectiveness of the service we are providing.	-	25%	12%	57%	-	6%
IT receives the budget it requires to run effectively.	25%	12%	25%	32%	-	6%
We train and develop our staff.	-	6%	38%	31%	19%	6%
We have a professional Help Desk infrastructure in place, including call management, resource coordination, reporting and statistical analysis.	19%	6%	6%	57%	6%	6%

CONCLUSION

The researched responses in the chapter reveal that there are numerous reasons why institutions do not outsource. There is uncertainty regarding the value of outsourcing and if it can provide a value proposition. However, co-sourcing is seen as a viable option to assist in providing the required technology services within the institutions.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The research provided an insight into the way outsourcing is perceived by the Chief Information Officers / Information Technology Directors, and the value it may add to the business. The findings are discussed in this chapter, with recommendations of possible areas where outsourcing can provide value. Numerous other possible avenues for further research are provided towards the end of the chapter. The conclusions are presented in a way that is easily understood, with the focus on the application of the research findings.

5.2 ANALYSIS OF FINDINGS

The reasons for outsourcing used in the questionnaire were provided by respondents to the 8th annual outsourcing index survey that was done by The Outsourcing Institute (Casale, 2005). The rankings provided below in table 5.1 list the responses of both surveys, the one conducted by the Outsourcing Institute, and the survey conducted within the South African public higher education sector.

Table 5.1 Ranking comparison.

Reasons for Outsourcing	South African Higher Education ranking	Outsourcing Institute ranking
Free resources for other purposes	1	3
Resources are not available internally	2	5
Gain access to world-class capabilities	3	4
Improve company focus	4	2
Accelerate reengineering benefits	5	6
Reduce and control operating costs	6	1
Share risks	7	9
Function difficult to manage or out of control	8	9
Make capital funds available	9	9
Cash infusion	10	10

It is clear that the respondents in the higher education sector survey rate the requirement for skills more important than the companies responding to the international survey. This is an indication that the necessary skills are not readily available, and that the institutions deem this a challenge for the effective functioning of their environment. This is also shown when the institutions were asked to indicate which reasons would strategically influence a decision to outsource. The high ranking of these issues ties in with the general shortage of skills in South Africa. The annual skills report released by Brainbench (2005:20) and (2006:19), based on certification tests of over 300 000 people in more than 200 countries, show that South Africa moved down from 19th to 23rd position in terms of the number of certifications received between 2005 and 2006. An article published in Rapport (Steenkamp, 2007:4) relates the fact that various segments of industry are experiencing skill shortages. She furthermore states that Paracon, a supplier of information technology services to companies, are importing skilled staff from India, as there are insufficient skills available locally. The article also shows that between 2002 and 2004, universities produced 16% less graduates in the information technology environment. Research done by IDG in the early 21st century indicated that there would be a 62% shortfall of information technology professionals in South Africa by 2003 (Cisco, n.d.: [1]).

The fact that international respondents rate the reduction and control of operating costs as the number 1 reason to outsource (Casale, 2005), indicate that saving money is still a major factor when outsourcing. The higher education respondents listed the reduction of cost as the 6th most important factor when outsourcing technology, and the 4th most important strategic influence. It is the belief of the researcher that this factor will become more important in future, as the respondents indicated, as shown in chapter three, that their budgets are either decreasing or staying the same.

There is a high level of outsourcing, although mostly partially outsourced, indicated within the software and hardware maintenance and support areas. When analysing the results of the questionnaire, respondents indicate that the hardware is normally purchased with a maintenance warrantee. It was also indicated that this is not a focus area and that outsourcing the function assists in managing the risks associated with doing it in-house. The high level of software maintenance support outsourcing can be partially be ascribed to the high level of use of ITS, as shown in chapter three. ITS, the company, maintain a high level of involvement in the product, and institutions have maintenance agreements in place. With some respondents they also assist in the maintenance of the underlying databases that is used by their product. Again, skill shortage is listed as a factor in the outsourcing decision.

Training is another area that indicated as a highly outsourced function. It is indicated that it costs less, and that it makes sense to outsource specialised training.

The network support and management functions do not show a high level of outsourcing, and no institutions fully outsource these functions. The primary reason provided by the respondents for outsourcing is again the lack of in-house skills.

The majority respondents indicating that they will be outsourcing services in the next two years were not planning to totally outsource functions, but will again only outsource parts of the function. There was a marginal increase in interest in the management and telecommunications functions outsourcing.

When analysing the reasons why respondents do not outsource, 85.7% indicated that it was too expensive to outsource, 71.4% cited loss of control, and 57.1% indicated that there is adequate in-house expertise. This is an indication that cost plays a major role in the decision

to outsource. Loss of control, or perceived loss of control, and cost have also been found to be an issue with higher education institutions internationally (Compass Consulting International, 2007). The fact that there are in excess of 50% of the respondents that indicate adequate in-house experience is in contrast with the respondents that do outsource. The unavailability of in-house resources is one of the primary reasons why respondents would outsource. It is also provided as a reason in almost every category of functions that are outsourced. The comment of one respondent, that 'there is a perception that those who outsource have one foot in the third world', does not test true. Outsourcing is seen as a strategic driver in the developed world, and as many articles and research indicate, there is strong growth in outsourcing worldwide. Growth projections have been provided in chapter two.

In the risk analysis of outsourcing within the higher education sector, it was interesting to note that the providers of outsourcing services was seen to be a high risk area. Respondents indicate all risks listed that included vendors as being valid. A concern is that vendors also have issues relating to inadequate skills (Steenkamp, 2007:4), and will not be able to provide the required level of expertise. The responses as listed in chapter four table 4.4 is commensurate with the results of the Mcaulay *et al.* (2002:249) research done in the United Kingdom. Respondents indicate that the skills of the vendors are the most important criteria when selecting an outsourcing partner. Again, pricing (cost) does not rate very high, ranking only 5th.

The majority of respondents (81.25%) indicated that there is a difference between higher education Information and Communication Technologies and private sector Information and Communication Technologies environments. The difference in focus, financial or other, is cited as a major difference. The environment within the institutions are generally more open,

and Information Technology governance and policy enforcement is not as stringent as in the private sector. Institutional culture plays a key role in the differentiation. As the technology infrastructure and services are enablers (Cisco, n.d.: [1]) that support the business function, it is to be expected that the institutional Information and Communication Technologies environment will reflect the business culture.

With regards to co-sourcing, either between institutions, or between institutions and other providers, the institutions indicated that there is a willingness to participate, and the majority indicated that they will gain value from such an arrangement. Table 4.5 in chapter four shows the responses of the institutions to various service and related issues. Two aspects that stand out, are that the majority of respondents indicate that they have a professional helpdesk environment, but that support staff has limited career opportunities. The researcher is of the opinion that this may present an opportunity for a co-sourced solution, and that by creating regional co-sourcing agreements between institutions, it may be possible to retain skilled staff and provide growth opportunities. However, more research is needed in this area before a definitive conclusion can be reached.

5.3 CONCLUSIONS

The research conducted demonstrates that there are similarities between issues affecting outsourcing in the international arena and public higher education institutions in South Africa, but that there are also key differences. Skill shortage is a major factor in the institutions, while it is not rated as one of the top drivers in international surveys (rated 5th in Outsourcing Institute survey). Overall, skill availability within South Africa is a cause for concern.

Financial pressures will increasingly play a role in the decision making process, as budgets increasingly come under pressure. Information and Communication Technologies departments will need to become more innovative and explore alternative options such as outsourcing and co-sourcing in order to continue providing an acceptable level of service as expected by the respective institutions.

Outsourcing is taking place within the surveyed institutions, but this is primarily partial outsourcing of services. The levels of total outsourcing of functions are very low.

Differences exist between higher education institutions and the private sector. However, if institutions become more business oriented and cost-effective the dissimilarities may become less pronounced. The research did not address this aspect.

There is a general doubt with relation to outsourcing vendors. The research shows that institutional Chief Information Officers / Information Technology Directors have reservations regarding the ability of outsourcing providers to provide an improved level of service.

A model for co-sourcing between institution-to-institution and institution-to-service provider could be created. Based on the research, outsourcing services within the higher education Information and Communication Technologies environment does not currently seem to be a viable option to provide significant value. However, as more knowledge and understanding regarding the various facets of outsourcing is gained, the researcher is of the opinion that it can provide value to the higher education sector.

5.4 RECOMMENDATIONS

Based on the research done, the following recommendations are put forward:

- Institutions must explore the possibility of standardising and simplifying their environments where possible. By standardising across institutions, it may be possible to negotiate better agreements from vendors regarding cost and the provision of services. Although it is not reflected in the research, the researcher is aware that such initiatives are already being explored and entered into (e.g. Microsoft, Oracle). However, it could be extended to network, computer and server vendors, where a large variety of brands are being used.
- Outsourcing opportunities exist within the networking, telecoms and printing environments. These are areas where economies of scale can play a role. These areas, although important, does lend itself to being managed and operated by external providers. They all provide an underlying infrastructure for the business, and service levels based service provision can be specified, measured and managed.
- The research indicates a high level of helpdesk proficiency within the institutions. This provides an opportunity for co-sourcing between institutions. Skill transfer, cost saving and increased service levels are benefits that can be achieved.
- Other areas of co-sourcing should be explored between institutions. Skills that exist within one institution could be used on a contractual basis to assist other institutions. There is a level of cooperation between institutions, but this cannot be constituted as co-sourcing.
- A better understanding of the facets of outsourcing needs to be promoted within the higher education sector. This may provide avenues that can be explored to gain value.
- Institutional Information and Communication Technologies departments should look at all the financial aspects of total processes. This will assist in highlighting the cost

and benefit of technology and their supporting services. Only when all costs are known and quantified can a balanced decision be taken with respect to the best options to provide the services.

- Differentiation should be made between the uniqueness of the environment and the infrastructure. For example, is the network or server infrastructure unique, or is it the services that are provided on them that provide business advantage?
- It should be endeavoured to introduce more business principles into the institutional technology environment. Cost-benefit analysis should be done on services provided and the business value of services, products and functions should be illustrated to the management of the institutions.

5.5 FURTHER RESEARCH

There are a variety of areas where further study is required to provide a better understanding of the complexities of both the public higher education information technology environment and their sentiments toward outsourcing. These are:

- The reasons why such a diversity of technologies are used within the higher education environment. Is it as a result of mergers, the complexity of the environment, historical reasons, financial reasons or a combination?
- The impact of the mergers on the Information and Communication Technologies environments of the institutions. Will it promote outsourcing / co-sourcing or not?
- The requirements for the establishment of a successful co-sourcing model that can provide value to the institutions.
- The view of outsourcing companies with relation to the opportunities that exist within higher education and their reasons for the low levels of outsourcing in these environments.

- The views of the Executive management of public higher education institutions on the outsourcing of technology outsourcing and whether it could provide value.
- Although not directly related to the outsourcing research, it was noted that there is significant variance of technology staff with relation to the size of the institution. Research into the fundamental reasons for these discrepancies may provide interesting insight into the manner in which technology services are approached.

In conclusion, the technology environment, and the management thereof is a complex issue. A balance between executive management requirements, the needs of end users and the effective management of this environment is vital in order to provide the company with the advantages that can and should be gained through this important resource. Outsourcing is only one of the options available to provide value within this environment. However, outsourcing is in itself a complex issue, and any decision to enter into an outsourcing partnership should be preceded with thorough research into all aspects of the business that will be affected and the value to be gained must be made implicit and measurable.

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ANNEXURE A: QUESTIONNAIRE

The purpose of this questionnaire is to determine the status of outsourcing of technology services in the South African Higher Education sector. It will form part of a dissertation.

The questionnaire is divided into three parts;

Section A is required for identification purposes.

Section B will be used to provide background information on the Technology structure of the various Institutions, and will form part of the dissertation.

Section C will comprise of the research regarding outsourcing of technology.

Please complete the questionnaire as completely as possible.

Please note that development is not included in the questionnaire.

The questionnaire will be distributed electronically and questions have been adapted to suit the electronic environment.



Section A: Contact and Institutional Information

Institution Name: _____

Name: _____

Job Title: _____

Contact number: _____

Email address: _____

Number of campuses: _____

Please provide the total number of University: Staff _____

Students _____

Total Institutional Budget: R _____



Section B: ICT Information

Technology

1. Number of computers in Institution:

Staff	
Laboratories	
Other (specify)	

2. Number of printers in Institution:

Desktop	
Multifunction	
Large Volume	
Other (Specify)	

3. Number of servers in Institution (including mini- and midrange)

4. Does your institution still utilise a mainframe?

Yes	No
-----	----

5. What is the primary desktop operating system?

Windows	
Linux	

6. What is the primary network operating system?

Windows	
Linux	
Netware	
UNIX	
Other (Specify)	

7. Number of network switches:

Core	
Edge	

8. Primary network equipment provider:

3Com	
Alcatel	
Avaya	
Cisco	
Enterasys	
HP	
Lucent	
Nortel	
Other (Specify)	

9. Which vendor's RDBMS are in use?
(Mark all that apply)

Microsoft	
Oracle	
IBM	
Other (Specify)	

10. Which Student system is in use?

ITS	<input type="checkbox"/>
Oracle	<input type="checkbox"/>
PeopleSoft	<input type="checkbox"/>
SAP	<input type="checkbox"/>
In-House system	<input type="checkbox"/>
Other (Specify)	<input type="checkbox"/> _____

11. Which Financial system is in use?

ITS	<input type="checkbox"/>
Oracle	<input type="checkbox"/>
PeopleSoft	<input type="checkbox"/>
SAP	<input type="checkbox"/>
In-House system	<input type="checkbox"/>
Other (Specify)	<input type="checkbox"/> _____

12. Which administration system is in use?

ITS	<input type="checkbox"/>
Oracle	<input type="checkbox"/>
PeopleSoft	<input type="checkbox"/>
SAP	<input type="checkbox"/>
In-House system	<input type="checkbox"/>
Other (Specify)	<input type="checkbox"/> _____

13. Which is the primary collaboration system in use?

Exchange	<input type="checkbox"/>
GroupWise	<input type="checkbox"/>
Notes	<input type="checkbox"/>
Other (Specify)	<input type="checkbox"/> _____

14. What are the systems that are considered most important to your Institution?
List the top 3 systems in order of importance.

1) _____

2) _____

3) _____

Financial

15. Please provide your annual ICT budget for:
Provide each one as a % of the total ICT Budget.

Staff	R _____
Technology	R _____
Operations	R _____

16. What percentage of the Institutions total budget is allocated for the ICT function?
(in percent %)

R _____

17. Have the annual budget increased or decreased during the periods of:

2004 – 2005	Increased	Same	Decreased
2005 – 2006	Increased	Same	Decreased
2006 – 2007	Increased	Same	Decreased
2007 – 2008 (forecast)	Increase	Same	Decrease

18. In your opinion, is the budget for the listed segments adequate to provide the required level of service expected by the institution?

Staff
Technology
Operations

Yes	No
Yes	No
Yes	No

Operational

19. Please provide the total number of ICT staff. (exclude system development staff)

Permanent _____
Contract _____

20. Are there service level agreements in place between your department and those you provide a service to?

Yes	No
-----	----



Section C: Outsourcing

1. In an international survey the following rationale were given as the primary reasons why companies outsource. Please rate them in order of importance by ranking them from 1 – 10.

Reduce and control operating costs	<input type="checkbox"/>
Improve company focus	<input type="checkbox"/>
Free resources for other purposes	<input type="checkbox"/>
Gain access to world-class capabilities	<input type="checkbox"/>
Resources are not available internally	<input type="checkbox"/>
Accelerate reengineering benefits	<input type="checkbox"/>
Function difficult to manage or out of control	<input type="checkbox"/>
Make capital funds available	<input type="checkbox"/>
Share risks	<input type="checkbox"/>
Cash infusion	<input type="checkbox"/>

2. Which of the reasons will influence your strategic decisions if considering outsourcing of any services under your control? Mark all that apply.

Reduce and control operating costs	<input type="checkbox"/>	
Improve company focus	<input type="checkbox"/>	
Free resources for other purposes	<input type="checkbox"/>	
Gain access to world-class capabilities	<input type="checkbox"/>	
Resources are not available internally	<input type="checkbox"/>	
Accelerate reengineering benefits	<input type="checkbox"/>	
Function difficult to manage or out of control	<input type="checkbox"/>	
Make capital funds available	<input type="checkbox"/>	
Share risks	<input type="checkbox"/>	
Cash infusion	<input type="checkbox"/>	
Other (Specify)	<input type="checkbox"/>	_____

3. Are any of the following services outsourced?

		If Yes				
Software maintenance and support	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Hardware maintenance and support	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Training	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Management services	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Printing	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Network Support	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Network Management & Operations	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Database Services & Operation	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Technology procurement	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Helpdesk	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					
Telecommunications	<table border="1"><tr><td>Yes</td><td>No</td></tr></table>	Yes	No	<table border="1"><tr><td>Full</td><td>Partial</td></tr></table>	Full	Partial
Yes	No					
Full	Partial					

Other (Specify) _____

Yes	No
Yes	No
Yes	No

Full	Partial
Full	Partial
Full	Partial

4. If you answered Yes to any of the options in question (3), please provide the reasons for outsourcing above services.

Software maintenance and support _____
 Hardware maintenance and support _____
 Training _____
 Management services _____
 Printing _____
 Network Support _____
 Network Management & Operations _____
 Database Services & Operation _____
 Technology procurement _____
 Helpdesk _____
 Telecommunications _____
 Other (Specify) _____

5. If you answered No to all options in question (3), why have you chosen not to outsource? Mark all that apply.

Adequate in-house expertise
 Loss of control
 Too expensive
 Lack of experience with outsourcing
 Organisational resistance
 Other (Specify) _____

6. Are you planning to outsource any of the following services within the next 2 years? Mark all that apply.

Software maintenance and support

Full	Partial
------	---------

 Hardware maintenance and support

Full	Partial
------	---------

 Training

Full	Partial
------	---------

 Management services

Full	Partial
------	---------

 Printing

Full	Partial
------	---------

 Network Support

Full	Partial
------	---------

 Network Management & Operations

Full	Partial
------	---------

 Database Services & Operation

Full	Partial
------	---------

 Technology procurement

Full	Partial
------	---------

 Helpdesk

Full	Partial
------	---------

Telecommunications

Other (Specify) _____

Full	Partial
Full	Partial
Full	Partial

7. If you answered No to all options in questions (3) and (6), under what conditions and circumstances do you feel outsourcing may be appropriate for your environment?

8. What do you see as risks when outsourcing any of your services? Mark all that apply?

1 = Totally disagree, 2= Somewhat disagree, 3= Neutral, 4=Somewhat agree, and 5 = Totally agree.

Vendor opportunism	1	2	3	4	5
Lack of flexibility	1	2	3	4	5
Loss of intellectual property	1	2	3	4	5
Financial stability of the vendor	1	2	3	4	5
Lack of active management of the vendor	1	2	3	4	5
Over-dependence on the vendor	1	2	3	4	5
Vendor's lack of knowledge of the client	1	2	3	4	5
Treating IT as a commodity	1	2	3	4	5
Lack of employee morale	1	2	3	4	5
High staff turnover	1	2	3	4	5
Loss of expertise within client	1	2	3	4	5
Vendor failing to provide contracted service to the required level	1	2	3	4	5
High costs of controlling the vendor	1	2	3	4	5
Escalation of costs	1	2	3	4	5
High switching costs	1	2	3	4	5
Lack of attention to retained IS employees who can affect the client-vendor relationship	1	2	3	4	5
Rushed consultation causing operational problems during transition (poor performance/morale)	1	2	3	4	5
Multi-vendor outsourcing	1	2	3	4	5
Lack of attention to business needs during consultation causing strategic misalignment	1	2	3	4	5
Client not understanding what is being outsourced	1	2	3	4	5
Mismatch of client/vendor culture causing conflict of interest	1	2	3	4	5
Outsourcing parts of IS, leading to fragmentation and loss of control/focus	1	2	3	4	5
Other (Specify)	1	2	3	4	5
Other (Specify)	1	2	3	4	5
Other (Specify)	1	2	3	4	5

9. What criteria do you, or will you use in selecting an outsourcing provider?
Mark all that apply.

Pricing	<input type="checkbox"/>
Technology / skills	<input type="checkbox"/>
Business experience with vendor	<input type="checkbox"/>
Business function speciality	<input type="checkbox"/>
Flexibility	<input type="checkbox"/>
Business ethics / corporate culture	<input type="checkbox"/>
Client testimonials	<input type="checkbox"/>
Financial status	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>

10. Do you think that the Higher education ICT environment is different than the private sector? Yes No

11. If the answer to (10) is yes, please provide the reasons for your answers.

12. Do you think co-sourcing can enhance the delivery of a cost effective service? Yes No

13. If you answered Yes to question (12), please provide the reasons.

14. If you answered No to question (12), please provide the reasons.

15. Please answer the following questions by marking the appropriate number.
 1 = Totally disagree, 2= Somewhat disagree, 3= Neutral, 4=Somewhat agree, and 5 = Totally agree.

Users of our current Information Technology component are satisfied with the level of service that they receive.	1	2	3	4	5
We keep up-to-date with the latest Information Technologies.	1	2	3	4	5
We have high staff turnover.	1	2	3	4	5
Support staff has the skill depth required to solve all Information Technology problems.	1	2	3	4	5
We are pro-active in solving problems.	1	2	3	4	5
We are reactive in solving problems.	1	2	3	4	5
Support staff has limited career options.	1	2	3	4	5
When Information Technology staff members is on leave the standard level of service deteriorates.	1	2	3	4	5
We have measures in place to assess the efficiency and effectiveness of the service we are providing.	1	2	3	4	5
IT receives the budget it requires to run effectively.	1	2	3	4	5
We train and develop our staff.	1	2	3	4	5
We have a professional Help Desk infrastructure in place, including call management, resource coordination, reporting and statistical analysis.	1	2	3	4	5

