

DURBAN UNIVERSITY OF TECHNOLOGY

**Investigating Vendor Selection Criteria in Information Technology
Outsourcing using Multiple Criteria Decision Making**

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DECLARATION

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DEDICATION

In dedication to:

My husband, my pillar of strength and my amazing kids without whom none of this would have been possible.

My parents, the king and queen in my life, for making me the person I am today. I am ever so grateful for having you both in my life.

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TABLE OF ABBREVIATION	
IT	Information Technology
ITO	Information Technology outsourcing
DM	Decision Maker
DMs	Decision Makers
BEE	Black Economic Empowerment
MCDM	Multi Criteria Decision Making
MCDA	Multi Criteria Decision Aid
GP	Goal Programming
ANN	Artificial Neural Network
MP	Mathematical Programming
RR	Relative Ratio
SAW	Simple Additive Weighting
AHP	Analytical Hierarchy Process
TOPSIS	Technique for Order Performance by Similarity to Ideal Solution
PC	Pairwise Comparison
SA	Sensitivity Analysis
PTP	Procure to Pay
MEP	Month End Processes
BOF	Back Office Finance
DEA	Data Envelope Analysis

Abstract

The selection of an appropriate vendor from a set of competing vendors in information technology outsourcing is an essential decision for the effective and efficient management of supply chain management in a fiercely competitive environment. Given the growing and intensive applications of information technology resources to improve process efficiency, achieve growth, foster innovation and transform service delivery, the need arises to outsource the major information technology operations of an organisation, as a strategy for organisations to concentrate on their core businesses. Information technology outsourcing is an important constituent in supply chain management, because it demands effective selection of an appropriate vendor, based on multiple conflicting criteria. Supply chain management places strong emphasis on effective evaluation and selection of vendors against usually conflicting multiple criteria, rather than on cost as a single criterion upon which to base a decision. Multiple criteria generally include both qualitative and quantitative attributes, some of which can be fuzzy in nature.

The overarching purpose of this research is to screen the most important criteria of information technology outsourcing for vendor selection based on expert opinions. The experts are from institutions of higher education, health, inspection and testing, property, shipping, state own enterprise, local government and transportation, who share their views regarding criteria that influence their vendor selection decision. Since the vendor selection decision is characterised by a high degree of subjectivity, interdependency and conflicting criteria, the analytic hierarchy process is applied to determine the weights of the identified criteria, evaluate and rank the potential vendors that provide information technology outsourcing services to the sampled institutions. The sample size for this research comprises 16 respondents and the 11 criteria which are cost, quality, commitment, additional resources, additional expertise, prior work, contract terms, confidentiality, location, on supplier database and black economic empowerment. Results show that quality of product is the most important attribute for vendor selection in information technology outsourcing. In addition, the study found that the sampled institutions can categorise their information technology outsourcing vendors more effectively and select a more effective supply chain partner. Moreover, the sampled institutions can provide unsatisfactory vendors with valuable feedback that will help them improve and become good partners in the future.

CHAPTER ONE

INTRODUCTION

Many corporate organisations operate in an economic climate that forces the efficient use of human resources in order to achieve high performance throughput. Most of these organisations prefer to concentrate on their core business activities and leave some or all of its non core activities to specialised vendors in order to reduce operating costs, improve organisational focus, and increase access to the latest capabilities. This strategy used by organisations to contract certain functions to specialised vendors is called outsourcing. In general, outsourcing allows organisations to seek alternative methods to improve production, provide efficient customer services, improve customer relationship and reduce cost to deal with the rapid changes, thereby enabling organisations to fully concentrate on their core activities (Ha and Krishnan, 2008).

Information Technology Outsourcing (ITO) is defined by Nduwimfura and Zheng (2016) as the transfer of Information Technology (IT) functions of an organisation to a vendor. The intrinsic reliance on applications of technology by the modern organisations to improve efficiency and effectiveness has made ITO a critical issue in supply chain management. This is because many of these organisations do not have expertise in operation of technologies, hence they rely heavily on external expertise by increasingly outsourcing their IT services. The realisation of financial benefits is the single most important factor driving organisational satisfaction with ITO (Corbett, 2004). To produce these financial benefits, organisations need to clearly identify areas of improvement and engage with an experienced outsourcing vendor. As a matter of fact, organisations often outsource their IT services with a survey showing that 67% of the participating organisations currently outsource IT functions, and this number is expected to increase in the future (Deloitte, 2016). Figure 1-1 gives an overview of the diverse functions that different organisations outsourced in 2016, where it can be seen that 67% of organisations outsource their IT services (Deloitte, 2016). Indeed, IT is suitable for such an approach, due to the supportive role that it has traditionally played in the implementation of business processes. Organisations are able to focus on their core business, and reduce the IT activity costs by using the specific IT

capabilities of another organisation. In the case of an IT outsourcing organisation, lower costs, standardisation and economies of scale also apply (Ernst and Young, 2011).

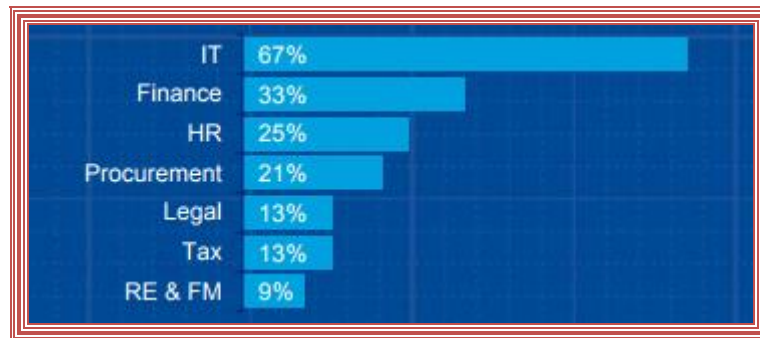


Figure 1-1: Deloitte’s 2016 Global Outsourcing Survey (Deloitte, 2016)

All vendors do not provide the same level of service in terms of quality, cost and timelines. It is therefore stressed by Faisal and Raza (2016) that the selection of vendors is a key factor for successful and effective ITO. However, according to Mann, Folch, Kauffman and Anselin (2015), ITO is not a difficult choice to make, but the way in which to go about this process is complex. On the other hand, Pourkiani and Hamzei (2015) stated that the selection of vendors in recent times has developed into a pertinent strategic matter. The steps involved are the activities that can be outsourced, the choice of a vendor, and analysing the cost factor. It is therefore imperative that organisations develop some sort of methods to assist them in making informed decisions from a list of many vendors. This further impact’s on the nature of decision making being difficult. Alternatively, the vendor selection process is able to satisfy the requirements of clients – that is, affordable and good quality products – as well as addressing other important matters, such as volume and time, is extremely important in building an appropriate and an applicable chain of supply. In line with this, it is imperative for an organisation to have an ITO vendor that suits their organisational needs.

The selection of a suitable outsourcing vendor is also important, because ITO transactions involve multi-shore or multi-vendor delivery models, with a lessening dependence on asset ownership transfers. ITO transactions are critical to the operations of an organisation that involves many complex issues, requiring subject matter experience from a wide variety of practice areas. As such, the team may include lawyers in areas as diverse as tax, privacy and data management, intellectual property, immigration, labour, and employment (Palvia, 2017). For example, ITO transactions frequently include a significant

transition of personnel from the client to the vendor, for which the organisation relies on the labour, employment, and the Employee Retirement Income Security Act of 1974 subject matter contacts (Halvey and Melby, 2007). Also, organisations often work with clients' inside and outside subject matter experts in these areas, while providing perspective unique to transactions of this type.

1.1 Challenges of Outsourcing

This section enunciates the common challenges associated with ITO. Although the list does not include an exhaustive list of challenges to be considered, it clearly justifies that multiple criteria need to be taken into account when selecting vendors. Therefore, in line with these challenges, a robust approach to vendor selection could be helpful for rigorous vendor evaluation and selection.

The very first challenge that organisations are likely to experience when embarking on outsourcing some of their functions is a possible lack of buy-in from people in the organisations, which may take the form of active or passive resistance. The prospect of outsourcing also creates uncertainty for existing employees, who may decide to look elsewhere for employment (Adekunle and Adekunle, 2017). Another challenge to the success of outsourcing is the expectation of clients that the outsourcing vendor will take care of everything. If the expectations of outsourcing, especially in the management of an organisation are too high, this will soon lead to overcritical feedback and disappointment (Sharma, Apoorva, Madireddy and Jain, 2008). It is important that an organisation's executive management team is informed about the risks of an outsourcing project, the potential costs, and the mitigation strategies.

There is also the challenge of the business process control. When a client organisation signs a contract to have a vendor organisation performs a certain function, the management and control of that function is being transferred to the vendor organisation. Although the client organisation will have a contract in place, the managerial control will belong to another organisation. The outsourcing vendor may not necessarily be driven by the same standards and mission that drives the outsourcing organisation. The vendor will be driven to make a profit from the services provided; hence many client organisations believe that there is a

struggle to control. According to Currie (2000) and Faisal and Raza (2016), the outsourcing organisation does not have full control of the business process when activities are outsourced.

The hidden cost of a contract between a vendor organisation and client organisation can be a serious challenge. A contract forms an integral part of the agreement for outsourcing a service. Vendors are normally the ones who draw up the contract, because they have the experience and expertise in drawing up these types of contracts. However, additional legal fees may have to be incurred in order to retain lawyers and other personnel to review the contract and provide oversight. The vendors sometimes do not have a good understanding of their client organisations (Lee and Kim, 1999; Sharma *et al.*, 2008) and some of them may need to be constantly monitored (McFarlan and Nolan, 1995; Stuart, Verville and Taskin, 2012). In addition, sometimes vendors do not complete the job within the specified time frame. Therefore, if proper service level agreements are not clearly specified in the contract, there is the possibility of experiencing poor IT service levels in terms of timeliness, quality and efficiency, because the outsourcing organisation is in most cases motivated by profit. Since the contract will fix the price, the only way for outsourcing organisations to increase profits will be to decrease expenses. As long as the vendor meets the conditions of the contract, the client will have to pay the agreed price, and any additional charges. In addition, it is possible for the outsourcing organisation to lose the ability to rapidly respond to changes in the business environment (Lioliou and Willcocks, 2009).

The notion of information confidentiality is another important challenge to outsourcing. The lifeblood of any business is the information that keeps it running effectively, so it is important to protect such information as much as possible. If an organisation has sensitive data or any other confidential information that will be diffused to the vendor, there is a high risk that the confidentiality may be compromised. If the outsourced function involves sharing proprietary company data or knowledge, such as product drawings and formulae, this must be taken into account. The outsourcing vendors have to be carefully evaluated on the basis of their integrity so as to ensure that sensitive information is protected and the contract has a penalty clause if an extra-ordinary incident occurs. The intellectual property of organisations includes business plans, trade secrets and other proprietary knowledge. Outsourcing presents a considerable high risk of theft or hacking of this property to client organisations. In addition, there is the challenge of securing the confidential information of an organisation through its clients when outsourcing business processes. Due

to the vendor company being an outside organisation, distributing sensitive information may become a serious issue. Gritzalis, Yannacopoulos, Lambrinouidakis, Hatzopoulos and Katsikas (2007) believe that it is risky to outsource sensitive personal information to a vendor, for security reasons.

1.2 Risks of Outsourcing

If all of the processes are carried out properly and according to plan, this will lower the risk of the outsourcing task. Unfortunately, similar to any other organisation's decision, levels of risk are eminent in outsourcing (Aubert, Patry and Rivard, 1998; Earl, 1996). Franceschini and Galetto (2003) add that many organisations do not follow all the phases in the overall process of outsourcing. This contributes to failed projects. Also, Palvia (2002) highlights that shareholder values are sometimes not optimised, due to the lack of IT management experience. The author posits that 70% of IT managers are inexperienced in managing of outsourcing projects. Lui (2003) has stated that 50% of the failure of IT projects is alluded to the risk criterion. This was a consequence of not providing the expected value. The three main reasons for clients being dissatisfied were: 1) in the client-vendor relationship, there is poor communication; 2) in the client-vendor relationship, there is a lack of planning to manage the relationship; and 3) keeping up with constant change in business plans and technology.

It is also evident that the client-vendor relationship is important. This relationship should slowly become a partnership for a successful venture. However, Lee and Kim (1999) state that building an outsourcing partnership involves many challenges, namely: 1) the client organisation needs to understand the vendors focus; 2) the vendor needs to know what the core activities are; 3) the vendor needs to understand the organisational structure; and 4) the vendor needs to establish relationships with key personnel. A research covering over 329 large Spanish firms shows that the loss of critical skills and competencies is an important outsourcing risk. Figure 1-2 gives an overview of the most common risks of outsourcing, with the loss of critical skills and competence being in the top four. (Gonzalez, Gasco and Llopis, 2010).

1.3 Problem Statement

The selection of an appropriate outsourcing vendor from a set of competing vendors, is generally a decision making process that involves multiple conflicting, uncertain and interdependent criteria. It is intrinsically a challenging problem in supply chain management that demands for an effective evaluation of appropriate outsourcing vendors based on certain criteria. The problem presents a huge subjectivity with multiple criteria that include both qualitative and quantitative attributes that requires an effective mechanism to translate qualitative information into quantitative information for effective processing.

Despite the proliferation of studies in this research area, a well-accepted single approach suitable to clearly identify areas of improvement and engage an outsourced vendor remains elusive. A plausible first step decision for organisations lies in determining which set of criteria is the most important to conduct effective vendor selection. Literature shows that organisations struggle to choose an appropriate vendor who best suits their needs, as there are multiple criteria involved (Olugbara and Nepal, 2012; Aruldoss, Lakshmi and Venkatesan, 2013). Dealing with multiple criteria is a complex process, where, in many cases, the client organisations do not possess suitable approaches for the selection and evaluation of vendors. Many organisations do not have an effective mechanism in place to decide on the most suitable criteria to base selection decisions, to evaluate the suitability of vendors for outsourcing decisions, and to rank vendors amongst multiple competing vendors. In line with this argument, this study is designed to faithfully answer the following research question. **What appropriate decision making process can be developed for guiding vendor selection in IT outsourcing?**

1.4 Research Aim and Objectives

The overarching aim of this research is to screen the most important criteria of ITO vendor selection, based on the opinions of experts from the selected institutions, regarding which criteria influence their vendor selection decisions. To realise this particular aim, the following objectives are conspicuously defined.

Objective 1 of this study is to establish the decision criteria that influence the selection of ITO vendors. As discussed previously, there are most probably multiple criteria that affects vendor selection. It is therefore imperative to investigate and interrogate the different criteria, in order to determine their level of importance in vendor selection decisions.

Objective 2 of this study is to use the Analytical Hierarchy Process (AHP), a mathematical multiple criteria optimisation method to determine the importance of a criterion in vendor selection decision. In order to do this effectively, it is necessary to examine the various methods already reported on by previous authors.

Objective 3 of this study is to develop and validate a decision making process for guiding the decision of the ITO vendor selection. This decision making process should serve as a heuristic for determining a set of criteria, to evaluate and rank ITO vendors soliciting for ITO service in an organisation.

1.5 Contribution of the study

Previous research has applied multiple criteria decision making through the use of optimisation tools such as AHP, Technique for Order Preference to Idea Solution (TOPSIS), and Data Envelope Analysis (DEA), to solve a number of practical problems such as human resource management and vendor selection for telecommunication system as a way of meeting customer satisfaction. The robustness of these formal tools have been demonstrated in many vendor selection problems. However, little work has been reported on the application of analytical hierarchy process to vendor selection for IT outsourcing covering multiple sampled organisations to identify common criteria. This study has recorded important contributions to the supply chain management research by identifying common criteria from disparate organisations for ITO vendor selection.

This study focuses on the identification of appropriate criteria for ITO vendor selection, based on expert opinions utilising information from 16 heterogeneous organisations. Since IT applications cut across disciplines and domains, it is important to use information from diverse experts to discover a set of suitable criteria for guiding the ITO vendor selection. Although AHP has been used in the telecommunications (Tam and Tummala, 2001), automotive (Yadav and Sharma, 2016; Choudhury, 2016) and engineering

(Hamdan and Cheaitou, 2017) industries there has been very little research on the application of AHP with respect to IT services. The major contribution of this research is the use of AHP, especially using the MakeItRational™/®/© tool for vendor selection of IT services. The AHP was used to rank the criteria from the clients and the vendors. AHP determined the most important criteria from the clients organisation and vendors organisation. Finally a decision making process was formulated with the purpose to choose the most suitable ITO vendor.

1.6 Scope and Limitation of the study

Although many non core activities can be outsourced, this research focuses on the outsourcing of the IT services. The literature study shows that although a number of studies have been carried out in ITO internationally, there has been insufficient research carried out in ITO in the context of South Africa. Outsourcing may include a wide range of activities such as payroll, marketing and transport. However, this research focuses on client organisations that are outsourcing all, or part of their IT services. The client and vendor organisations vary from medium to large-scale enterprises, and include organisations from governmental and private sector. These clients and vendors' organisations are located in KwaZulu-Natal, Gauteng and Western Province in South Africa. The research will focus on the criteria that are necessary to make an informed decision in the selection of ITO vendor.

1.7 Research Methodology

The research methodology is the conceived plan and structure of investigation to obtain answers to the research questions. In this case, a descriptive research method (Easterby-Smith, Thorpe and Jackson, 2012) is used to study the relationships between IT outsourcing criteria. Descriptive research facilitates the study to obtain accurate and complete information regarding a concept, situation or practice. A survey method is thus followed to elicit quantitative data for each decision criterion (Easterby-Smith *et. al.*, 2012).

Both primary and secondary data were collected in this study. Primary data were gathered using the questionnaire instrument to formulate quantitative information regarding criteria into numerical data for effective preferential processing. Secondary data were

collected via a literature study involving many books, journals, magazine, reports and websites.

The data collected was analysed using the AHP software. The results were presented in the form of graphs, cross tabulation and other figures. Statistical methods were used for data analysis. In this study, there are multiple criteria that affect the success of outsourced projects. Faisal and Raza (2016) stressed that these multiple criteria must be taken into consideration in the selection of vendors. Since multiple criteria need to be considered, it is important to use a Multiple Criteria Decision Making (MCDM) method to analyse the multiple criteria. Further, the AHP was used to assist with multiple criteria problems and in the decision making. According to Saaty (1980) the AHP was used to make decision making easier taking into consideration human intuition and judgements in conjunction with multiple criteria.

1.8 Overview of the Dissertation

Chapter One introduces the study by discussing the challenges of outsourcing, risks of outsourcing, problem statement, research aim and objectives, study contributions, scope and limitation of the study and research methodology. Chapter Two introduces the types and processes of outsourcing, selection of vendor for outsourcing, criteria for vendor selection for outsourcing and decision making methods for vendor selection. Chapter Three deals with determination of IT outsourcing criteria, validation of IT outsourcing criteria, determination of suitable MCDM methods for IT outsourcing, determination of suitable MCDM software for ranking IT outsourcing vendors and comparison of criteria ranking. Chapter Four analyses demographic results, why and how organisations outsource IT services, results of the criteria importance, results of ranking IT outsourcing vendors. Chapter Five concludes with the limitations of this study and suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

The cardinal objective of this chapter is to briefly explain the similarities and differences of some closely related concepts in vendor selection process. This is accomplished through an intensive review of the extant literature already available on vendor selection for service outsourcing. The reason for reviewing vendor selection for outsourcing services in general is to uncover the extent of work done in order to establish the contribution of this study. Consequently, this chapter covers the arguments, strengths, weaknesses and limitations of the reviewed articles, focused on IT outsourcing.

2.1 Types and Processes of Outsourcing

The technology revolution has recorded a huge impact on the way most corporate organisations do business. Environmental, and technological factors keep changing and in order for organisations to remain competitive, they need to swiftly adapt to these changes. Organisations are therefore seeking alternative methods to improve production, provide efficient customer services, and reduce costs, in order to deal with the rapid changes in the technology. Moreover, organisations experience high operational costs as a result of contending with collective business processes (Ha and Krishnan, 2008). According to Hans and Mithas (2013), the introduction of ITO can assist in the reduction of high operational costs of organisations and improve the efficiency of business processes in order to achieve operational excellence. In addition, organisations assume that IT will assist in cost saving. They believe this can occur by outsourcing their IT, instead of employing more staff and increasing divisions and departments (Nduwimfura and Zheng, 2015).

Outsourcing indicates the relationship with a specialist vendor for work that was previously handled internally (Corbett, 2004). To manage complex and costly IT services, outsourcing has given organisations another option to assist with their problems. Outsourcing has become very important, as it provides an alternative strategy (Grover, Cheon and Teng, 1995; Faisal and Raza, 2016). Organisations believed that ITO vendors are more

knowledgeable in the IT stream, where their work will be more efficient than it being handled internally. The organisations posit that the IT stream is a non core activity (Dibbern *et al.*, 2004). Chang and Gurbaxani (2012) posit that a vendor will produce more efficient results in service delivery as compared to the client, due to their IT knowledge. King (2004) adds that organisations ought not to perform activities that are outside their core activities, therefore Pfannenstein and Tsai (2004) state that it should rather be given to other organisations, because they can do these activities better, at a lower cost, and probably faster.

2.1.1 Types of Outsourcing

To take a huge advantage of outsourcing, it is imperative that decision makers (DMs) understand different outsourcing types. The section broadly identifies the types of IT outsourcing.

2.1.1.1 Total Outsourcing

A vendor is focused on and in control of all your IT obligations. It is characterised by long-term megadeals, which can sometimes lead to trouble a few years into the contract. In long-term contracts, organisations often complain about excess fees for services beyond the scope of the contract, ‘hidden costs’ such as software license transfer fees, and fixed prices that are significantly greater than that of current market prices. In addition, termination of contracts often can prove prohibitively expensive (Currie, 2000; Faisal and Raza, 2016; Lacity and Willcocks, 1998; 2000).

2.1.1.2 Selective Sourcing

An organisation focuses on many vendors to administer various IT services. It is characterised by short-term contracts of less than five years, for specific activities such as software development and support services. With this type of contract, the vendor assumes responsibility for the insourced IT activities. Selective sourcing can meet vendor needs and provide expected cost savings, while minimising the risks associated with total outsourcing approaches. However, selective outsourcing may have some drawbacks, such as the increased transaction costs associated with multiple evaluations, multiple contract management, and potential lack of integration and coordination (Currie, 2000; Faisal and Raza, 2016; Lacity and Willcocks, 1998; 2000).

2.1.1.3 Strategic Alliance Sourcing

This is a partnership between the client organisation and vendor. It is an agreement between two or more parties to pursue a set of agreed upon objectives needed while remaining independent organisations. It can develop in outsourcing relationships, where the parties desire to achieve long-term win-win benefits and innovation based on mutually desired outcomes. Partners may provide the strategic alliance with resources such as products, distribution channels, manufacturing capability, project funding, capital equipment, knowledge, expertise, or intellectual property. The alliance is a collaboration which aims for a synergy, where each partner hopes that the benefits from the alliance will be greater than those from individual efforts. The alliance often involves technology transfer (access to knowledge and expertise), economic specialisation, shared expenses, and shared risk (Currie, 2000; Faisal and Raza, 2016; Lacity and Willcocks, 1998; 2000).

2.1.1.4 Insourcing

An organisation focuses on IT services using existing in-house resources or employees. It refers to a business that retains management and provision of at least 80% of the IT budget after evaluating the IT services market. Included in the definition of insourcing is the buying-in of vendor resources to meet a temporary need. The client retains responsibility for the delivery of IT services, since outside vendor resources supplement internally managed teams (Currie, 2000; Faisal and Raza, 2016; Lacity and Willcocks, 1998; 2000).

2.1.1.5 Rural Outsourcing

This outsourcing entails the transfer of management services and provision of services to rural areas of the client organisations homeland (Ho and Atkins 2008, cited in Annttiroiko 2008:1178). The vendor is in the same country, but in a less expensive location. Lacity, Rottman and Khan (2010) opine that rural outsourcing is beneficial to many organisations in the United States. In their study, 35 interviews were conducted comprising founders, executives, managers and team members, which led to the deduction that rural outsourcing is indeed a trending need in outsourcing of services. Rural outsourcing concentrates on using highly competent workforce in low cost areas. This strategy suits organisations from a cost perspective, which makes rural outsourcing successful in its undertaking.

Lacity *et al.* (2010) have stressed the following regarding rural outsourcing, namely: 1) rural outsourcing is not staff augmentation, however, it is based on using a highly qualified project team to deliver a good quality service at a lower cost; 2) rural outsourcing is not freelance outsourcing i.e. the vendor uses their own employees who are on their payroll. The vendors do not subcontract their duties which could result in divulging of confidentiality; 3) rural outsourcing addresses an unfilled gap in a client's portfolio by rendering the outsourced service which essentially would have been performed by insourcing (client's employees); 4) rural outsourcing vendor's progress forward in the value chain. They do this by continually improving their work to offer better products by ways of development and applying innovative ideas to their initial work; and 5) rural outsourcing vendors operate optimally on a self-build basis which simply entails time allocated for experienced personnel to train new entrants into their organisation.

Clients see the value in rural outsourcing, where they are able to conduct their business in the same time zone, achieving a high quality of service, being culturally compatible and being in relatively close proximity to the vendor (Lacity *et al.*, 2010).

2.1.1.6 Offshore Outsourcing

Offshore outsourcing or offshoring is work that is passed on, specifically in IT services and vendor development, which is beyond the borders of the host country (Beylerian and Kleiner, 2003). Matloff (2004) referenced a study by Gartner Group is projecting that by 2010, in which it was found that 25% of all IT jobs in the United States will ultimately transfer overseas, and Carmel and Agarwal (2002), who stated that 40% of the Fortune 500 organisations that were reported were involved in offshore outsourcing as early as 2001.

King (2008) stated that outsourcing IT jobs to vendors outside multi-cultural areas is a gamble in terms of choice. Davis, Ein-Dor, King and Torkzadeh (2006) meanwhile highlight that offshoring is not considered to be a one way path, and that participating countries who send work offshore are not only labelled as offshore origins, but also as offshore recipients as well. Niederman, Kundu and Salas (2006) state revenue, quality and cost to be advantages gained by certain organisations involved in offshore outsourcing. While other organisations experience the opposite effect, i.e. loss of intellectual property and projects not working out to some extent. Certain organisations do not wish to participate in offshore outsourcing, which will cause them to be at a disadvantage in their industry. While others will benefit by gaining competitive advantage or be susceptible to making expensive mistakes. We may note

that IT outsourcing and offshoring may vary from organisation to organisation. As Davis *et al.* (2006) have stated, a benefit of offshoring is lower labour costs, but the benefits of the economy are not the same for all participating countries in offshoring.

King (2005) has stated that movements offshore were envisaged to continue because of the abundance of IT skills abroad. According to the Software Engineering Institute, India has roughly 40% of the most successfully rated software organisations. However, vendors based in India have seen the need to maintain closer relationships, and have consequently opened offices and increased the complement of their staff in North America to provide these services (King, 2005). Lagunes, Del Valle and Castillo (2016) conclude that multinational organisations have successfully benefited from vendor selection from a global network.

2.1.2 Processes of Outsourcing

According to Schniederjans, Schniederjans and Schniederjans (2005), procurement activity can be divided into many steps as shown in Figure 2-1. Although Schniederjan *et al.* (2005) applied this process to vendor selection in a supply chain environment; it can easily be applied to the selection of ITO vendors.

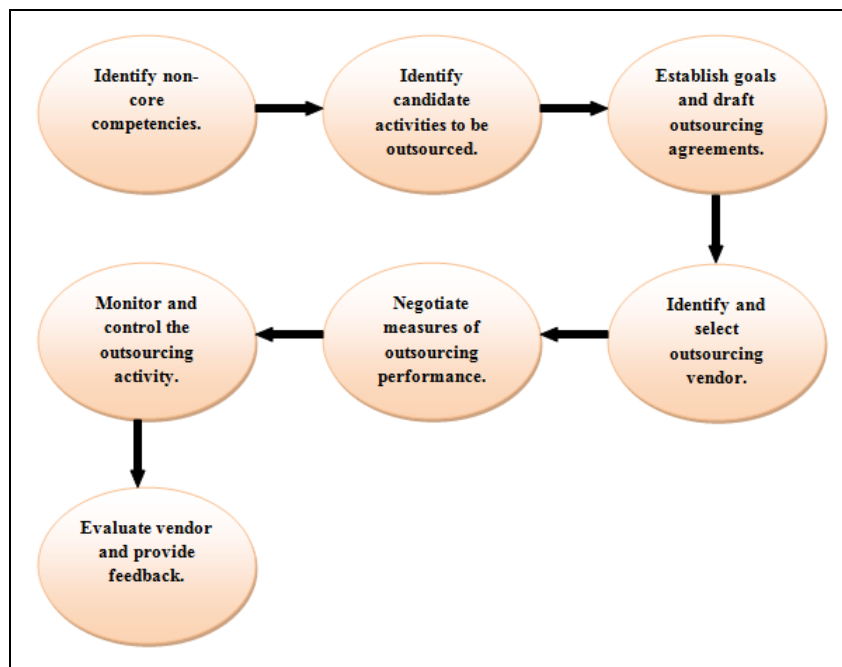


Figure 2-1: Overview of the Outsourcing Process (Schniederjans *et al.*, 2005)

2.1.2.1 Identify the non core competencies

The first step in this process is to identify the non core competencies/activities. As discussed previously, it is not strategic to outsource core activities. It is therefore necessary to identify the non core activities and then determine which of these non core activities to outsource. The next step is to identify the activities that need to be outsourced.

2.1.2.2 Identify candidate activities to be outsourced

A decision to outsource affects an entire organisation and is highly strategic. Therefore, when an organisation makes a decision to outsource, the costs and benefits must be evaluated first. If the benefits outweigh the costs, then a decision to outsource can be made. King (2008) stated that there were three criteria to take into account when determining whether an IT activity should be outsourced: 1) the IT activity needs to be performed in-house, in the same location as the users; 2) it is risky to outsource the IT activity as it is too important to the organisation; and 3) the IT activity requires more development before being outsourced. Cheong, Jie, Meng and Lan (2008) opine that if the selection is not done properly, this may result in negative consequences. The client organisation needs to ensure that none of its core activities are outsourced. Petkov and Petkova (2009) highlighted that outsourcing solutions appropriate in one instance may be inappropriate in another instance. Therefore, models that help in outsourcing decisions need to be developed according to specific situations and within its given constraints. The next step is to establish goals and draft outsourcing agreements/contracts.

2.1.2.3 Establish goals and draft outsourcing agreements

Contracts are also very important, and they play a vital role in the client-vendor relationship. Aubert *et al.* (1998) have stated that ITO encompasses decision making on a number of issues. These may include activities the client wishes to outsource, and other activities to keep internally, selecting a suitable vendor and management of the contract. Ketler and Willems (1999) also stated that the vendor selection and contract terms are factors that determined if the outsourcing is successful or simply a disaster. The contract should include the following: 1) service; 2) price ownership; 3) duration; and 4) flexibility. Managing of the contract must not be controlled by the vendor, although the vendor may be an expert in contract negotiations, and may possess much more experience compared to the client.

According to Goo, Kishore and Rao (2000), contracts, service level agreements, compensation plans, measurement systems, etc. can only be aligned more closely to yield successful outsourcing results when objectives and drivers are more clearly understood and articulated, rather than when only an amorphous outsourcing intent is stated. Therefore, the contract must be understood by the client-vendor at the start of the relationship.

Lioliou and Willcocks (2009) have stated that contracts that are not clearly defined normally result in high IT costs, and poor IT service levels, but they also stated in their research finding that trust, collaboration and commitment in the outsourcing venture cannot make up for the broken relationship, although the contract can be the facilitator. The next step is to identify and select the outsourcing vendors.

2.1.2.4 Identify and select outsourcing vendor

According to Halvey and Melby (2005), outsourcing is the responsibility of the vendor for the non core organisational activities. They further stated that the vendors possessed the required expertise to carry out their duties. It is easy to understand and an increasing number of organisations throughout the world outsource some significant portion of their IT services. Many organisations began to reduce staff, lower fixed costs, and consequently utilise vendors, without compromise their service delivery as a result of the recession unfolding in 2008 (Dubie, 2009).

According to Feeny, Lacity and Willcocks (2005) client organisations must select vendors who possess the adequate competency in their specialised fields, to fulfil their needs. The authors further stated that the client organisations assumed that the vendor resources are exaggerated in terms of the facility, the composition of their workforce and technological aspects, whilst failing to focus on the vendors' simplicity abilities to perform the clients' requirements. In order to evaluate a vendor, due understanding of the areas of expertise such as resources, methods and values must be considered. Feeny *et al.* (2005) concluded that various processes need to be undertaken for successful evaluation of vendors.

Singh, Rajput, Chaturvedi and Vimal (2012) postulated that the selection of a vendor amongst various other alternatives is critically important for executive management. The authors' further stressed that reliance of an organisation on its vendors leads to disastrous consequences relative to poor decision making. It is therefore critical for an organisation to make an informed decision on a suitable vendor.

King (2008) posits that the performance of the IT function in its entirety is dependent on the performance of all vendors who were assigned with critical tasks. In this light, the choice of the suitable vendors becomes an IT success factor. The author concluded that in order to be successful, attaining appropriate methods and skilled staff are also crucial elements.

2.1.2.5 Negotiate measures of outsourcing performance

Choudhury (2016) has declared that it is imperative that clients ensure the relationship with their vendors is strong in order to remain ahead of their competitors. The client-vendor relationship is very important. The relationship sets the foundation in the type of work the vendor will deliver.

As stated by McFarlan and Nolan (1995), one of the most important problems associated with the successfulness of outsourcing relationships is the constant monitoring (Stuart *et al.*, 2012) of the vendor's performance. The vendor may produce good results at the beginning of the relationship, but this can slowly change if constant monitoring is not taking place. Vendors must not only be satisfied with trust that has been given to them by their client organisations, but they must also work to strengthen that trust for ongoing business relationships (Nguyen, Babar and Verver, 2006). The trust will assist in changing their relationship into a partnership, which will benefit the client and the vendor. Therefore, for a successful partnership, trust and constant monitoring of the vendor is a key factor. The success of a client-vendor relationship depends on the satisfaction of the client, achieving the objectives and expectations and especially the relationship over time (Stralkowski and Billion, 1988). Jain and Khurana (2016) believe that it is therefore necessary to enter into a contract, which will form the basis for the established relationship.

Goles and Chinn (2005) highlighted the attributes and processes from their research on outsourcing relationships. The harmony of the relationship is assisted by attributes. Attributes in turn are developed by the processes. Table 2-1 summarises the attributes and processes used in their research.

Table 2-1: Attributes and Processes (Goles and Chinn, 2005)

<i>Attributes</i>	<i>Processes</i>
Commitment	Communication
Consensus	Conflict resolution
Cultural Compatibility	Coordination
Flexibility	Cooperation
Interdependence	Integration
Trust	

According to King (2005) and Mann *et al.* (2015), attention to detail must be given in the client-vendor relationship. Some of the important aspects/issues to be considered include:

- 1) *Criteria used for vendor selection*
- 2) *Outsourcing contract details*
- 3) *Constant monitoring of progress*
- 4) *Phase of control applied by the client over the vendor*
- 5) *Client-vendor relationship - the level of trust*

King (2005) concluded that all of the above must be included, as they have indicated to be critical success factors for outsourcing to be effective. The objectives of vendors are sometimes not the same with the client when dealing with technology. Therefore, the client must maintain a technology and the vendor assessment capability. The next step is to monitor and control the outsourcing activity.

2.1.2.6 Monitor and control the outsourcing activity

Aubert, Patry and Rivard (2005) recommended that there were a number of issues to look at when deciding to outsource, whether it is the choice to outsource, the selection of the vendor, or the best way to manage the contract. Outsourcing is thus complex, and does not depend on a single factor. Ho and Atkins (2008 cited in Annttiroiko 2008:1178) concluded that outsourcing decision making is a complex process, which looks at issues within a range of political, economic and technological domains. They added that “managers not only need to critically analyse all aspects of the business, but also need to interact with multiple organisational layers (strategic, tactical and operational) in order to understand the associated implications.” Lacity and Hirschheim (1993) have concluded that contract delivery, adaptability to change, and being able to support services of value, are determinants to obtain success in outsourcing.

Research by King and Torkzadeh (2008) have identified a number of factors that affect outsourcing management, namely: 1) vendor management capability and practices, which were found to increase the performance of measures of outcome i.e. client-vendor relationship satisfaction; 2) service quality and trust in the client, which are of paramount importance for the vendor to positively and successfully complete offshored projects; 3) the outcomes of the projects are not fully relative to the client's control; 4) the outcomes of the projects quality is improved due to the good relationship between client and the vendor; and 5) contracts that have fixed prices are preferred over those that have varying prices that are relative to material and time contracts. The factors mentioned above will require careful monitoring and control, and provide regular feedback.

2.1.2.7 Evaluate vendor and provide feedback

According to Jain (2013), the evaluation of an outsourcing vendor is based on three pertinent determinants. These determinants are as follows: 1) corporate performance; 2) delivery capabilities; and 3) contracting terms and conditions (Figure 2-2).

- 1) **Corporate Performance:** Organisations should look at acquisitions with a financially stable vendor which possess superior skill-set standards in their workforce. The vendor is also encouraged to be culturally compatible to ensure effective communication.
- 2) **Delivery Capabilities:** The vendor must be established and possess the high end infrastructure to deliver its service. Resources and technical expertise must be available by the vendor to handle projects at hand. The author adds that organisations must learn about the methodologies employed by the vendor, as well as the processes in order to be in sync with deliverables.
- 3) **Contracting Terms and Conditions:** The vendor should be flexible in service delivery, offer services that add value, offer valued and credible references, and provide robust internet protocol security.

The following aspects need to be evaluated under the category of **Corporate:** management, financial stability, cultural match, executive commitment, and HR practice. In terms of the category of **Delivery**, the following needs to be evaluated: domain expertise, relevant technical expertise, quality certification, open communication, and availability of key team members. In terms of the category of **Contracting**, the following needs to be

evaluated: price, IP protection, additional value added capacity, flexible contract terms, recent case studies, and references (see Figure 2-2 below). However, this set of criteria is insufficient for the South African situation (see section 2.3).

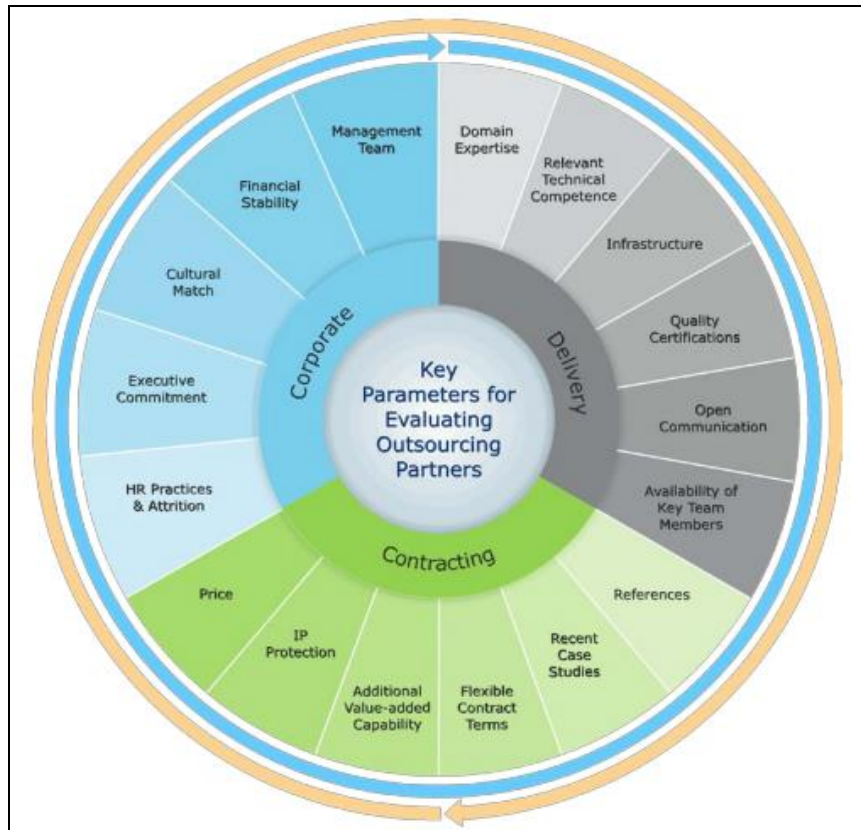


Figure 2-2: Criteria for the Selection and Evaluation and Monitoring of IT Outsourcing Vendor (Jain, 2013)

2.2 Selection of Vendor for Outsourcing

Once the decision to outsource is made, the next step is to decide on the activities to be outsourced and then to start the process of selecting an outsourcing vendor. Faisal and Raza (2016) believed that it is important to select a suitable vendor in order to make an effective ITO decision. Ping, Fuji and Jian (2009) claimed that vendor selection being a tedious problem. Many organisations have varying requirements, therefore existing IT cannot assist in providing a once-for-all organisational model for the selection of vendors. According to Yong and Shuqin (2008), there is no single vendor's package that will fulfil all requirements. Yong and Shuqin (2008) concluded that organisations must select an ITO vendor that is flexible, and an appropriate vendor that suits their business needs.

Apart from choosing the right vendors, it is also important to choose the right outsourcing decision process model. Models can be used in determining the criteria for

choosing the applications and services to be outsourced. Stark and Walker (2006) proposed the Strategy-driven Outsourcing Decision Process Model, stating that there is a necessity for strategy-driven decisions in the outsourcing process. The decision to outsource analyses the organisational strategic goals in order to obtain the desired outcomes of an outsourcing project. In addition, Lam and Tang (2006) contended that both vendor selection and the item that required outsourcing are coherent decisions, which made procurement effective. They regarded this as being complicated, as various objectives needed to be met at the same time. They further stated that there were different mathematical models: 1) deterministic; 2) single order; 3) single and multiple criteria models; and 4) single echelon. Accordingly, these models have been extremely popular in vendor selection problem research (Lam and Tang, 2006).

Wadhwa and Ravindran (2007) opine that a significant amount of money is spent on outsourcing. They posit that most large scale organisations outsource activities, which are very expensive. Their research on vendor selection comprises eight organisations from various sectors, i.e. transportation; logistics; sales; and IT. These authors believed that vendor selection is a critical step in outsourcing hence they have identified three critical conflicting criteria to be cost, lead-time and quality. The most common methodological techniques employed for multi criteria applications are goal programming and AHP. The criteria used by these authors were: 1) procurement services provided efficiently; 2) specialised technology and operational platforms provided; 3) reduction of staffing levels; 4) quality; 5) reliability; 6) technical capability; and 7) lead-times. They also stated that it is necessary to have good vendors in the highly competitive industry otherwise it would be a huge challenge to products of high quality and of low cost. If the vendor selection process is efficient, it can reduce risk and maximise total value for the client. In order to establish successful business relationships, these organisations will need to select criteria which are predetermined i.e. lead times; reliability; quality; technical capability etc.

The task of vendor selection is regarded as non-trivial decision whereby multiple conflicting criteria require examination. Generally, numerous decision makers (DMs) base their decisions on their intuition and experience. This process is posited by the researcher to be subjective, hence the need arises to develop a decision making process in the ITO vendor selection. In the review of literature, it is evident that selecting the most suitable vendor is vital. It has also been discovered that selecting of the most appropriate criterion which is adaptive and suited for a particular organisation is pertinent. Finally, the selected criteria are

regarded as vitally important issues in the vendor selection process because it measures the performance of these vendors.

2.3 Criteria for Vendor Selection for Outsourcing

The decision to outsource requires a considerable amount of consideration and analysis, which identifies the criteria for outsourcing. If these criteria are well met, then the whole functions or processes can be considered for outsourcing. Andrew, Rahoo and Nepal (2005) have stressed that decision making technology in any form positively assists and influences the human judgement by easily sifting conflicting criteria, and eradicating subjectivity, in order for the individual DM to achieve a logical and fair decision.

The research by Feeny *et al.* (2005) provided a comprehensive analysis of the criteria affecting the selection of outsourcing. A potential criticism of their work is that they provide only a general formulation of the relationships between criteria, and hence it is not easy to apply their recommendations for selection of a particular vendor. While different criteria are listed in their research, they do not provide a mechanism for weighting the importance of the criteria or for assessing an outsourcing vendor according to those criteria. Seydel (2006) stated that criteria must have their weights developed and calculate the scores from those alternatives with respect to the criteria, then, combining all data and providing scores for multiple criteria, one for each alternative considered. According to Weber, Current and Benton (1991) there is a wide set of criteria that have to be analysed and suitably weighted with reference to their context-specific importance. A suitable algorithm is required in order to obtain a synthetic rating index for each alternative and support DMs in their final judgement.

Faisal and Raza (2016) stressed that, due to the rapid growing rate of ITO, the selection of vendors should be assessed in accordance with selected criteria. The authors concluded that cost is normally the most popular criteria for selecting a vendor, however, they further acknowledged that there are numerous other criteria for consideration for ITO vendor selection. Choudhury (2016) highlighted cost, quality and delivery performance to be some of the criteria.

Rezaeisaray, Ebrahimnejad and Damghani (2015) used the hybrid MCDM approach whereby four vendors were used to define the approach's effectiveness. The authors highlighted some of the criteria to be product quality, on-time delivery, facility and technical capability, focus on basic activities, cost, and geographical distance. The authors believed that all of these criteria were important in the decision making in vendor selection.

Bhutia and Phipon (2012) postulate that a variety of organisations in the streams of information systems, communication, governmental sectors and in the general global environment have strained organisations to focus on supply chain management. Supply chain management entails delivery times to the client, the quality of intermediate and final products, and the procurement of raw materials and goods. The authors used 30 vendors in their study, of which a comparison was made between the vendors using criteria of: 1) product quality; 2) service quality; 3) delivery time; and 4) price.

Fadavi, Khanghah and Asli (2013) conducted a study on an organisation called Shima Film, which was used to prove the effectiveness and worthiness of the hybrid models for vendor selection. The authors illustrated that increased profits and better customer satisfaction were achieved as a result of the organisations ability and efficiency by focusing on core activities. Fadavi *et al.* (2013) perused the following criteria in their study for vendor selection. The criteria used are as follows: 1) quality; 2) cost; 3) risk; and 4) compatibility. The insight they provided was that traditionally, cost was either considered to be the sole criterion, or, all criteria were regarded as independent. However, they illustrated in their study that in fact, all criteria were interdependent, where cost was by no means the only criterion.

Feng, Chen and Jiang (2005) add that the selection of vendors in the manufacturing sector plays an extremely important role in both short and long term strategies. In their study, they used four vendors to determine the use of the following: 1) product quality; 2) service quality; 3) delivery time; and 4) price. Feng *et al.* (2005) contend that the criteria used are interdependent on a smaller scale of assessment, however, should the amount of vendors increase, and then there could be some problems which could be encountered. Overall, their methodology is highly robust, and can be put to effective use.

Ha and Krishnan (2008) undertook a study using a hybrid of methods for vendor selection. They used a total of 27 vendors, who reported both quantitative and qualitative criteria in supply chain performance. Along with these quantitative and qualitative criteria, a map can be devised to allow for multiple vendor selection. The criteria that were used for vendor selection are as follows: 1) reduce operating cost; 2) improve organisational focus; 3) increase access to latest capabilities; 4) improve production; 5) provide efficient customer services; 6) improve customer relationship; and 7) reduce cost.

According to Faisal and Raza (2016), the selection of an appropriate and suitable vendor is the most pertinent strategy applied in IT outsourcing in academic institutions in Gulf Cooperation Council (GCC) countries. A total of three vendors was used in their study to support their argument. The authors opine that vendors ought to be evaluated based on criteria selected from an outlined list. The list of criteria stipulated in their article, is as follows: 1) focus on core activities; 2) increase in flexibility; 3) access to new technology; 4) risk reduction; 5) cost; 6) improved client service; 7) reputation of the vendor; 8) quality; 9) financial stability of the vendor; 10) outsourcing contract management; 11) knowledge of the industry; and 12) willingness to negotiate.

In their study of offshoring, Khan and Lacity (2012) examined the pressures impacted vendor selection, amongst other issues. They used a global organisation known as the Everest Group in their study. The Everest Group contained in excess of 1 000 clients in their database and service provision cartel. The following criteria were perused by Khan and Lacity (2012): 1) cost; 2) access to expertise; 3) flexibility; 4) quality; 5) security/privacy; and 6) skills transfer. The authors concluded that cost savings, satisfaction of clients and increased flexibility were the main drivers in their research.

Akinsomi, Kola, Ndlovu and Motloung (2015) illustrated that the Black Economic Empowerment (BEE) compliant organisations have a competitive advantage over the non-BEE compliant organisations. BEE is the main criterion for their study. They also point out that BEE compliant organisations have higher returns, and are deemed as less risky than the non-BEE compliant organisations. Their study entailed the observation of 1 309 BEE organisation, as well as 1 141 non-BEE compliant organisations, which were used to prove their theory. The BEE can therefore be deemed a pertinent criterion in the selection of a vendor.

Sartorius and Botha (2008) opine that BEE did not take off as initially planned. The authors conducted their qualitative study on 62 organisations publicly listed on the Johannesburg Stock Exchange, which indicated less than 25% transfer of wealth to black owners. The main impetus for BEE is for it to play a decisive role in vendor selection and in economic transformation in South Africa.

Aruldoss *et al.* (2013) also used many techniques in their study for vendor selection. These techniques are referenced to multiple criteria, some of which are as follows: 1) cost; 2) proximity to the vendor; 3) resource availability; 4) on time delivery; 5) environmental impact; 6) reliability; 7) location of a vendor; 8) technical specification; and 9) services and communicate with the vendor. The authors buttress that some criteria are more complex than others, which indicates that common criteria lead to making informed decisions in vendor selection. The various MCDM methods perused offer the client a more resound opportunity to select vendors.

The DMs process entails selecting multiple criteria to make credible and the appropriate vendor selection decisions. As can be seen in the review of literature, multiple criteria analyses for vendor selection go back many years, however this phenomenon is in much existence presently. The basis for the identification of various multiple criteria for selecting of ITO vendor has been established. The next section provides an overview of MCDM and discusses the various methods for vendor selection.

2.4 Decision Making Methods for Vendor Selection

The task of vendor selection can be performed using MCDM methods. Kiker, Bridges, Varghese, Seager and Linkov (2005) have stated that MCDM is an assessment tool perused by DMs to assess their judgements. They further stated that this tool can assess both individual and group decision making problems. When assessing individual problems, the MCDM tool quantifies judgements, scores the alternatives based on the criteria, and assists the selection process. Assessment of group problems becomes more complex, due to numerous stakeholders being involved. This results in the decision being made by the group.

Lin, Lin, Yu and Tzeng (2010) concluded that MCDM was used for selecting a wafer-testing vendor in a case study of a Taiwan company. The MCDM was used to assist in the quality of the decision making. They concluded that MCDM can be utilised in other

industries apart from semiconductor organisations. They also posit that the selection process of vendors can be significantly improved, thereby achieving better satisfaction and performance levels.

Cheong *et al.* (2008) stated that they feel the necessity to achieve an ideal decision in actually experienced problems. These problems are made up of multiple criteria, as well as multiple alternatives in quantitative and qualitative platforms. In their study, they designed an AHP method using the MCDM approach. This model helped with the fuzzy set theory, to tolerate the fuzziness in the DMs judgements.

Ping *et al.* (2009) concluded that the selection of vendors is a problem which is solvable however, it does take a long while to solve, due to its tangibility and intangibility criteria. They used the multi-objective programming model to assist in selecting ITO vendors. Cost and risk factors were considered by the model during the module distribution phase amongst the vendors, in order to cut down on cost and the rate of failure.

Olugbara and Nepal (2012: para. 1 line 6) reports that daily human activities make the decision making process an inquisition in the study and research field. They posit that an organisation's upper management are faced with numerous options by means of which they make decisions. Consequently, managers may be faced with making the incorrect decision, which could prove to be detrimental for the organisation. MCDM methods, therefore, assist these managers in making an informed decision.

Aruldoss *et al.* (2013) stress that MCDM applies to the structure of a problem and is an approach which solves problems linked to planning and decision making, involving multiple criteria. MCDM methods are suitable for situations in which the DM needs take into consideration multiple criteria in achieving the best overall decision. The majority of the MCDM problems is comprised of integers, multi-objective linear, nonlinear and interactive problems of programming.

The use of MCDM allows for solving of problems which have many conflicting objectives. Wadhwa and Ravindran (2007) postulated that conflicting objects occur where the optimal value cannot be achieved at the same time. Most organisations have chosen to use the MCDM where there is an inconsistency in judgement. They find it difficult to make decisions regarding outsourcing. The MCDM will assist organisations in choosing the most appropriate vendor.

There are many decision making methods/models/approaches and tools available for optimising vendor selection. Aruldoss *et al.* (2013) described that multiple decisions are made from numerous criteria. As a result, weights that are chosen by the experts are allocated to the varied criteria. They further stressed the importance of multiple criteria evaluation and congruently determining the structure of the problem.

The MCDM methods have been applied to numerous applications. Its core objective is to find the best suited alternative solutions. Figure 2-3 refers to the MCDM's hierarchical view of some of its types and methods, which are used in this research. The following methods will be discussed in the sections below.

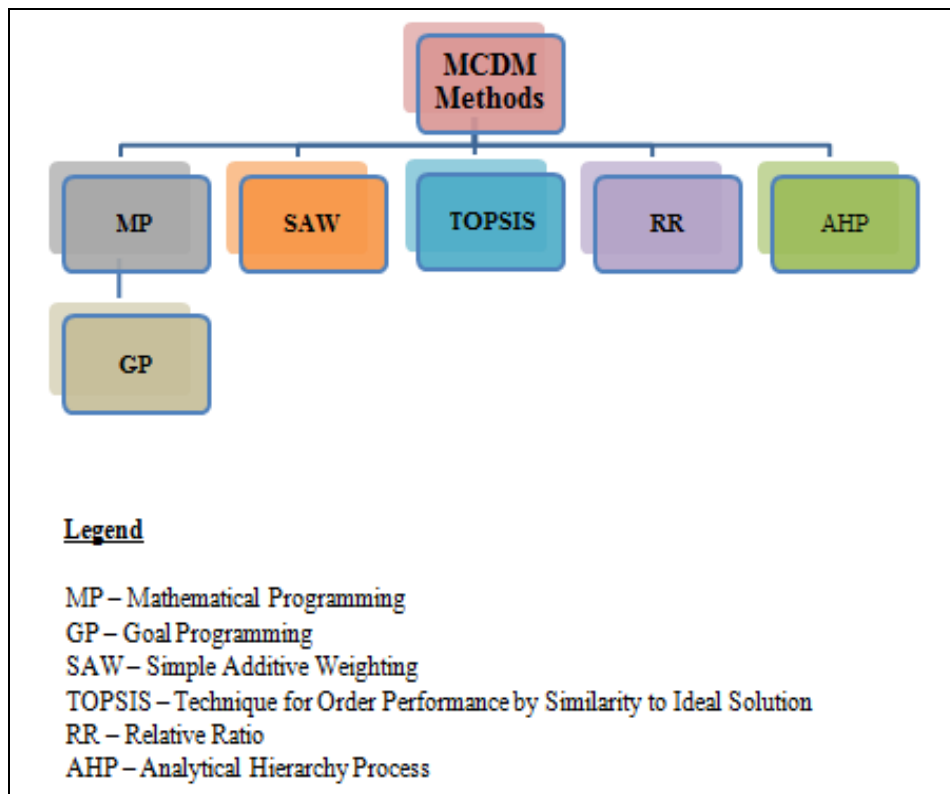


Figure 2-3: Methods of MCDM used in this research

2.4.1 Mathematical Programming

Kruger and Hattingh (2006:63) have described:

Mathematical programming as a management science technique whereby a decision maker (manager) attempts to solve a problem by seeking to optimise an objective that is subject to restrictions. In a specific class of applications, linear programming models are used as a mathematical means to allocate scarce resources to different tasks in such a way that an objective function is maximised or minimised.

Zhu (2007) has stated that the determination of vendor selection and order quantity decisions are carried out by using Mathematical Programming (MP) models. These models utilise Goal Programming (GP), mixed-integer programming, and linear programming techniques for this determination. Zhu (2007) has further stated that the MP model's purpose is for numerous vendor selections, aiming to inflate or deflate an objective function subjective to buyer and vendor restrictions. The author concluded that a negative of these approaches mentioned is minimal attention is paid towards non-financial factors for selection of a vendor and multiple planning periods.

Azar, Ozfirat and Ozkaraahan (2007) have asserted that GP to be a highly effective decision making tool. It uses a multi-objective approach. GP is dependent on the DMs goals. They also described that GP focused on minimised deviations of each goal, which were dependent on the system and goal restrictions. According to the authors, these goals and restrictions are meticulously defined in normal and routine GP formulation. Consequently, the downturn for using GP in decision making is the goal value determination of each individual objective function.

According to Hisjam, Guritno, Supriyatno and Tandjung (2015), GP is a tool utilised to analyse goals. GP's primary function is to cut back on deviations, which can be either negative or positive. Nixon, Dey, Davies, Sagi and Berry (2014) further stated that GP purposefully minimises deviations from goals specified by the vendor.

GP is noted to have many objectives, which seemingly conflict with one another. GP lacks the ability to set weights appropriately, and does not pair solutions efficiently.

However, it is simple and easy to use. GP is also able to handle large variables, objectives and constraints (Aruldoss *et al.*, 2013).

2.4.2 Simple Additive Weighting

Deni, Sudana and Sasmita (2013) indicated that Simple Additive Weighting (SAW) uses the principles of weighting and summation in its methodology. Basically, SAW rates the performance of each alternative on all aspects of determining the weighted sum thereof. They further mentioned that the method required a process which brought back the decision matrix to its normal state, whereby it can easily be compared against all alternatives' ratings. Deni *et al.* (2013) stated that the basic concept of SAW method is to find a weighted sum of ranking the performance of each alternative on all attributes.

Afshari, Mojahed and Yusuff (2010) have stated that SAW is a decision making technique which is both simple and easy to use. SAW is also used very frequently. According to the authors, SAW is based on the weighting average principle. The calculation entails a checking score for each alternative, which is derived by multiplication of the scaled value provided, with the alternatives attributes weightings of importance relativity (assigned by DMs). This is then followed by a summation of the products for all criteria.

Podvezko, (2011) highlighted some disadvantages of SAW as follows: 1) all values, including minimising criteria should be maximized, where the ultimate aim of SAW is to ensure all values are maximising ones; 2) all criterion values should be positive. These criterion values are dependent on their transformation type of change to positive values; and 3) the estimated results shown by SAW do not provide a true and real situation, as the results may be illogical, with varying values.

Some main features of SAW illustrated by Podvezko, (2011:137) are:

- 1) The criterion of the method SAW reflects the main concept underlying quantitative multi criteria evaluation methods, consisting in integrating the criteria values and weights into a single magnitude - the criterion of the method;*
- 2) The calculation algorithm of the method is not complicated, being implemented either without the help of a computer or by applying very simple computer programs and*
- 3) Normalized [sic] values of the evaluation of SAW*

criterion help visually determine the differences between the alternatives compared.

Afshari *et al.* (2010) have stated that there were multiple ways that have been developed to assist organisations in make best personnel selection decisions to place the right people in the most appropriate jobs. Selection of suitable personnel, which is dependent on targets of an organisation, available resources and DMs preferences, are intricately complicated problems. The SAW method was used in their research. Their method was suggested to solve personnel selection problems using the MCDM process. However, they highlighted that the SAW model ignores the fuzziness during the decision making process. This will have an impact on the output as measures cannot be precise because of uncertainty.

2.4.3 Technique for Order Performance by Similarity to Ideal Solution

Hwang and Yoon (1981) have forwarded TOPSIS as a useful technique in dealing with MCDM in the real world. This technique helps DMs to resolve problems; carry out analysis; comparisons; and ranking of alternatives. Hence, the selection of the most appropriate alternative/s will be decided. Olson (2004) concluded that TOPSIS is attractive, where limited subjective input is needed for DMs. The only subjective input required is weighted, and the key to accuracy is to capture accurate weights.

TOPSIS is a technique used by DMs for decision making. The approach is to find the criterion that is closest to the ideal solution. The TOPSIS method options are graded based on the ideal solution similarity. Bhutia and Phipon have argued that:

If an option is more similar to an ideal solution, it has a higher grade. The ideal solution is a solution that is the best from any aspect that does not exist practically and we try to approximate it. Basically, for measuring similarity of a design (or option) to ideal level and non-ideal, we consider distance of that design from ideal and non-ideal solution. In supply chains, co-ordination between a manufacturer and suppliers is typically a difficult and important link in the channel of distribution (2012:44).

Bhutia and Phipon (2012) also highlighted that their paper presented a MCDM for evaluation of vendor by using the TOPSIS method. The authors posit the TOPSIS method is a simple method to understand, and that it allows for the best criteria to be chosen through a mathematical calculation. Hence, the decision making process for the selection of an appropriate vendor is highly pertinent. The results illustrate that the TOPSIS model can be perused for making of decisions in the selection of vendors from the numerical data.

Bhutia and Phipon (2012) indicated their discovery of criteria, which have an effect of the vendor selection process. The authors calculated the weight of each criterion, which were based on AHP and used them with TOPSIS to rank the vendors. The primary advantages of TOPIS are as follows: 1) simple to use; 2) all types of criteria are taken into account, i.e. objective and subjective; 3) understandable and rational; 4) the calculation procedural processes are straightforward; and 5) looks for the best criterion in a simple mathematical calculation.

Kim, Park and Yoon (1997) and Shih, Shyur and Lee (2007) have addressed four TOPSIS advantages: 1) a logical process that represents the rationale of human choice; 2) the best and worst alternatives that are accounted for by a scalar value at the same time; 3) simple calculation procedural process are input into spreadsheets which are easily programmed; and 4) the measurement of performance for all alternatives can be seen on a polyhedron in minimum two dimensions.

Wang (2008, cited in Zaeri, Sadeghi, Naderi, Kalanaki, Fasihy, Shorshani and Poyan, 2011:101) highlighted the main advantages of using the TOPSIS method in their research are: 1) “simple to use”; 2) “take into account all types of criteria (subjective and objective)”; 3) “TOPSIS logic is rational and understandable”; 4) “the computation processes are straightforward”; 5) “the concept permits the pursuit of best alternative criterion depicted in a simple mathematical”; and 6) “the importance weights are incorporated comparison procedures.”

The advantages described above make TOPSIS a major MCDM technique compared to other related techniques such as AHP and Elimination and Choice Expressing Reality. Olson (2004:722) stated that “when there were many criteria, TOPSIS differed more from simple additive weight results, and TOPSIS was also affected more by a diverse set of weights. TOPSIS performed less accurately than AHP on both selecting the top ranked alternative and in matching all ranks in this set of simulations.”

Manokaran, Senthilvel, Subhashini, Muruganandham and Ravichandran (2012) used TOPSIS and SAW in their research. The authors analysed and ranked the performance of the employees using both these methods. Their research paper is extended with the validation of Artificial Neural Network (ANN) method; and stipulated two tasks as follows: 1) a comparison of the different MCDM tools for decision making problems; and 2) the determination of parametric analysis that were compared to the other methods. This includes solving the problem mathematically using both functions. In their study, the dominant factors were chosen by the authors based on responses received from employees who participated in the questionnaire and survey. Multiple methods were analysed, which were graded on the ranking of weights. The results were validated by use of the ANN method. These results indicated the favoured capability of the TOPSIS method, which was deemed easy to rank and choose the significant effect of stress from a given data. Employees who performed highly were ranked by comparing results obtained from TOPSIS, SAW and ANN.

Zaeri *et al.* (2011) researched the development of a methodology for vendor evaluation using TOPSIS. This methodology comprises three steps, which are as follows: 1) identification of the criteria; 2) weighing of the criteria by the use of expert views; and 3) using TOPSIS to evaluate alternatives and to determine the final rank.

Akkoc and Vatansever (2013) have noted that TOPSIS is used widely in different avenues in MCDM as follows: 1) TOPSIS based on the opinion that it presents the best appropriate result as the shortest distance to positive ideal solution, or the longest distance to negative ideal solution, as compared to AHP, or simple weighted summation methods; 2) TOPSIS is a method that is heuristic, understandable and simple; and 3) TOPSIS has some advantages compared to other methods: 1) the performance of the method is partially affected by the number of alternatives and powered by the increasing number of alternative and criteria in rank differences and 2) the order of alternatives may alter when non-optimal alternative is entered (Bottani and Rizzi, 2006).

Li (2009) concluded that the Relative Ratio (RR) method and TOPSIS are based on aggregating functions representing closeness to the reference point(s), for ideal solutions and/or the negative-ideal solution. Besides this, they use different forms of aggregating functions and different normalisation methods to eliminate the units and dimensions of attribute values. Li noted that “the RR method introduces p ξ (X_j) ($j = 1, 2, \dots, n$) based on the

L_p -metric, where $p \geq 1$ is an arbitrary distance parameter chosen by the decision maker according to practical situations” (2009:298).

Li (2009:309) goes on to state:

The TOPSIS is based on the concept that the chosen alternative should have the shortest distance from the ideal solution and the farthest distance from the negative-ideal solution. However, such a chosen alternative may not always guarantee to have the shortest distance from the ideal solution. Moreover, the TOPSIS introduces two reference points, i.e. the ideal solution, and the negative-ideal solution, but it does not consider the relative importance of the distances from these points.

A further comparison was carried out by Velasquez and Hester (2013). They conducted research on analysing various MCDM methods and determined their applicability to different situations by evaluating their advantages and disadvantages. Velasquez and Hester (2013) concluded that TOPSIS has certain limitations, as its use of EUCLIDEAN distance does not consider the correlation of attributes; and it is difficult to weigh and keep its judgement to be consistent. Saaty and Ozdemir (2003) stated that TOPSIS has major weaknesses which do not cater for the elicitation of weight, and is inconsistent in performing judgement verifications.

2.4.4 Relative Ratio

Li (2009) has highlighted that there are many choices together with multiple conflicting criteria, and that the RR methods deals with the selection and ranking from the options available i.e. alternatives. The alternative chosen should be far away from the negative-ideal solution, and close to the ideal solution, wherever possible. Li (2009:299) describes that “it is only an ideal goal that the best alternative is the one that has the shortest distance to the ideal solution and the further distance from the negative-ideal solution. However, this goal is not always satisfied”. He has further highlighted that the RR method focuses on ranking and selecting from a set of alternatives while multiple conflicting attributes are present. The ranking index is an aggregation of all attributes, the relative importance of the attributes and some balance between the distance closing to the ideal solution and the negative-ideal

solution. The author further stated that they do have concerns regarding the balance between the distances. Li (2009:304) concluded in explaining that:

The RR method introduces an aggregating function representing the distances from the ideal solution and the negative-ideal solution simultaneously. Its ranking index is an aggregation of all attributes, the relative importance of the attributes, and some balance between the distance closing to the ideal solution and the distance being far away from the negative-ideal solution. This balance is a major concern in real-life decision making.

2.4.5 Analytical Hierarchy Process

Rui, Lui and Liu (2008) have stated that selection of vendors in a corporate environment is a concern for modern organisations. They concluded that poor attention is paid in the decision making process for vendor selection, as well as the assigning of orders. Further to this, they suggested that a combinational AHP, multiple objective integer and the non-linear integer programming model to be used. This resulted in successful assistance in determining the most suitable vendors and allowing for the assignment of order quantities to the selected vendors under circumstances, based on discounts and the capacity of the chosen vendor. Kumar and Roy (2011) have suggested that the AHP model was developed and used to assist in the selection of vendors for certain items in the organisation. This was for a manufacturing organisation supplying customised power transformers to its clients. For certain items, the clients' identifies the vendors themselves, from whom the materials need to be purchased.

Chamodrakas, Batis and Martakos (2010) used AHP to assist in decision support to solve the vendor selection problem in an electronic marketplace environment. The paper used the satisficing approach with fuzzy AHP. This approach is used in the initial stage of the vendor selection process in order to shorten the vendors' search space, whereas fuzzy AHP is used in the last stage of the vendor process in order to produce the final ranking order of vendors. According to Ping *et al.* (2009) the greatest risk of ITO comes from the choice of the vendor, as the choice of vendors' errors will affect the whole project development scope, time and cost.

Saaty (1980) developed a decision model known as the AHP model. The main purpose of this method is the solving of decision making problems, which are prone to uncertainty, and those that consist of multiple criteria factors. When we make decisions we use our feeling and intuitive judgement as well. The AHP takes our feeling and intuitive judgement and logic into account to make a decision. This is the simple way in which to approach a decision, and the AHP will use this process, but will provide a more structured approach in making a decision. The AHP has both qualitative and quantitative characteristics. Qualitative characteristics are used to articulate the problem and its hierarchy, whereas quantitative characteristics are used to express judgement and preferences. The software Team Expert Choice can be used as a platform for AHP. Andrew *et al.* (2005) believe that the AHP could be perused to procedurally join many judgements of experts, in lieu of various conflicting criteria, to ultimately make an appropriate choice.

Saaty (2000) proposes the following advantages of AHP for outsourcing decision making:

Table 2-2: Advantages of Outsourcing (Saaty, 2000)

1) Unity	Provision of a model which caters for numerous problems that are unstructured.
2) Complexity	Combines systematic and deductive approaches in order to solve complicated problems.
3) Interdependence	Able to withstand interdependence of a system without giving attention and focusing on linear thinking.
4) Hierarchic Structuring	Categorises elements of a system into hierarchical levels thereafter grouping similar elements in each level.
5) Measurements	Measures intangibles by the provision and use of a scale. Also establishes priorities by providing a suitable method.
6) Consistency	Judgements that are used in determination of priorities are tracked by AHP for consistency.
7) Synthesis	Calculates and results in an estimation of each alternative's desirability.
8) Tradeoffs	In a system, it considers priorities of factors and results in enabling the most beneficial selection in accordance with specific goals.
9) Judgement and Consensus	Outputs an outcome from many varying and multiple judgements without considering consensus.
10) Process Repetition	Allows the user to redefine the problems to allow improvements in their judgments through repetition.

Forman and Gass (2001) have stated that the three primary functions of AHP are complexity, measurement and synthesis. Complexity deals with hierarchical structure. Measurement deals with ratio scale and the weights. Synthesis involves combining parts into a whole. The authors continue to note that AHP is a good candidate when structuring, measurement and/or synthesis is required. Success factors of AHP include: the selection of a single alternative from multiple alternatives; forecasting; allocation of resources; total quality management; quality function deployment; business process re-engineering; and the balanced scorecard.

Sari, Sen and Kilic (2008) have highlighted that the strength of AHP process lies in its ability to structure a complicated, multi attributes, multi person and multi period problem hierarchically. The AHP model can also deal with quantitative and qualitative attributes. These authors used AHP in their research on selection of partners in Virtual Enterprise. They stated that the AHP model enabled simultaneous congruence of irrational, rational and intuitive factors. They found that this method could be used for other application types, and that future users can develop more hierarchies and look at the problem in more detail.

The AHP model was used in Rui *et al.* (2008) research. Their research also included non-linear integer and multi-objective programming. The AHP was used to determine the best vendor, and the other two were used to place the optimal order quantities among the vendors.

The AHP model was used in Nepal, Petkov, Ramdeyal and Petkova (2001). Their research examined the process of strategy formulation and developing a strategic plan for an academic department at a tertiary institution. In their research, it was necessary to consider many conflicting criteria. The AHP model was used to introduce an easier way for formulating the strategies required for the development of the strategic plan.

The AHP model was used in a case study by Udo (2000:427). He stated the case example proved that “AHP can be used effectively to analyse IT outsourcing decisions. The decision making process can be consistently repeated and documented while sensitivity analysis can be performed on the best option before any action is taken.” The Sensitivity Analysis (SA) is helpful, as it provides interactive, real time, graphical display of the ranking of the options as the DMs compare different scenarios and possibilities.

The AHP model was used by Yang and Huang (2000). They developed a model for information system outsourcing. A decision model was used to assist managers choose and analyse factors and attributes easily. Due to the process being quantitative, better decisions can be made and better results from outsourcing can be obtained.

Cheong *et al.* (2008) also used the AHP in their research. According to the authors the AHP software is user friendly, in a simple format that allows for easy setup by the user. The design allows for user flexibility, where the software can be used on a web platform. Moreover, this software tool is highly intelligent, i.e. it provides a combinational domain reference channel through a database link in order to help the user to glean relevant data in regards to the problem domain prior to the construction of its hierarchical tree. This allows for downloading of information in real time via the internet and the MCDM problem analytical processing logic.

Sari *et al.* (2008:369) highlighted that “one of the biggest advantages of using proposed AHP model is easy to integrate into the virtual enterprise system and the user can customise the selection process through including or excluding anyone of four criteria. This flexibility enhances the robustness of the model in comparison with other techniques.” There have been numerous outsourcing decision strategies and determinants, but the current practise remains at the stage of conceptual discussions as to how to outsource the information systems activities. Furthermore, these strategies and determinants can only offer a qualitative magnitude of judgement. If strategies are not properly sorted out, this could damage the organisation and discourage managers in future tasks (Yang and Huang, 2000).

Sari *et al.* (2008:369) also highlighted some of the advantages of using AHP in vendor selection to be as follows: 1) the vendor selection process by using AHP takes into account both qualitative and quantitative factors; 2) AHP can display difficult selection factor in simple concepts of hierarchy, which can be accepted by the manager or DM; 3) “AHP goes through a dynamic group discussion and denotes the priority of a decision with certain numerical values. It does not involve statistics or probability theory, thus giving the user a better sense of reality”; 4) “AHP involves group discussion and dynamic adjustment to finally achieve the consensus. The evaluation is conducted by the participating experts who decide jointly on the parameters for pairwise comparison. It is thus more of a qualitative analysis”; and 5) “Non-qualified elements, after group evaluation and a mathematical process

can be quantified by numerical values to indicate a decision's priority. A decision-maker can reach the choice of partner in a very short time without resorting to precise data.”

2.5 Comparison of the Methods in Multi Criteria Decision Making

The main objective of the vendor selection process is to reduce risk and increase the overall value for the client. The vendor must add value to the client organisation by bringing about cost saving and revenue enhancement. Organisations use a number of approaches to evaluate vendors, as they believe there is no appropriate means for this.

Table 2-3 summarises the various MCDM methods. This table provides a comparative description of various MCDM methods as well as illustrating the benefits and limitations thereof.

Table 2-3: Comparison of the Methods in MCDM

MCDM Methods	Description	Benefits	Limitations
1) MP GP	MP purpose is for numerous vendor selections aiming to inflate or deflate an objective function, subjective to buyer and vendor restrictions (Zhu, 2007). GP's primary function is to cut back on deviations which can be either negative or positive (Hisjam <i>et al.</i> , 2015).	The use of MP allows for determination of vendor selection and order quantity decisions to be done simultaneously (Zhu, 2007). It is an effective decision making tool (Araz <i>et al.</i> , 2007).	Minimal attention is paid towards non-financial factors for selection of a vendor and multiple planning periods (Zhu, 2007). GP lacks the ability to set weights appropriately and does not pair solutions efficiently (Aruldoss <i>et al.</i> , 2013).
2) SAW	The calculation entails a checking score for each alternative which is derived by multiplication of the scaled value provided, with the alternatives attributes weightings of importance relativity (assigned by DMs). This is then followed by a summation of the products for all criteria (Afshari <i>et al.</i> , 2010).	SAW is a decision making technique which is very simple and easy to use (Afshari <i>et al.</i> , 2010).	These criterion values are dependent on their transformation type of change to positive values and the estimated results shown by SAW does not provide a true and real situation as the results may be illogical with differing and varying values (Podvezko, 2011).
3) TOPSIS	The technique is to determine the criterion that is closest to the ideal solution (Bhutia and Phipon, 2012).	Is a useful technique in dealing with MCDM in the real world. Provides assistance to DMs to resolve problems, carry out analysis, comparisons and ranking of alternatives (Hwang and Yoon, 1981).	"Such a chosen alternative may not always guarantee to have the shortest distance from the ideal solution. Moreover, the TOPSIS introduces two reference points, i.e. the ideal solution and the negative-ideal solution, but it does not consider the relative importance of the distances from these points" (Li, 2009:309).
4) RR	An RR method deals with the selection and ranking of the options available, i.e. alternatives. The alternative chosen should be far away from the negative-ideal solution and close to the ideal solution wherever possible (Li, 2009).	The RR method focuses on ranking and selecting from a set of alternatives while multiple conflicting attributes are present (Li, 2009).	"It is only an ideal goal that the best alternative is the one that has the shortest distance to the ideal solution and the further distance from the negative-ideal solution. However, this goal is not always satisfied" (Li, 2009:299).
5) AHP	The main purpose of this method is solving of decision making problems which are prone to uncertainty and those that consist of multiple criteria factors. A combination of qualitative and quantitative characteristics (Saaty, 1980). Provides interactive, real time, graphical display of the ranking of the options as the DMs compare different scenarios and possibilities (Udo, 2000).	The strength of AHP process lies in its ability to structure complicated, multi criteria, multi-person and multi period problem hierarchically (Sari <i>et al.</i> , 2008). Its design was to accommodate human nature and allow for many revisions (Saaty, 2000).	AHP is sometimes thought of as a 'soft' decision-support method, which does not handle the difficult estimation problem (Sari <i>et al.</i> , 2008).

AHP is a model that addresses the way in which to solve decision making problems with multiple criteria and uncertainty. This model takes our feelings and judgement into account when making a decision. Saaty (2000) mentioned that AHP is an excellent process and its design was to accommodate human nature and allow for many revisions.

Velasquez and Hester (2013) summarised in their research that the AHP is a hierarchy structure can easily adjust to fit many size problems, but can lead to inconsistencies between judgement and ranking criteria. Although the AHP model consists of limitations, it involves more benefits compared to other models in this research, especially in its ability to deal with SA.

According to Yildiz and Yayla (2015), the vendor selection process is absolutely pertinent. Various MCDM's were used between 2001 and 2014 for vendor selection. The MCDM process entailed researching the effectiveness and popularity of various models. These models are depicted in Figure 2-4. As can be seen, AHP comprised 26% of all individual methods most frequently used. Yildiz and Yayla (2015) concluded that AHP is indeed one of the most popular choices by means of which to measure human judgement and opinions of which other MCDMs are incapable.

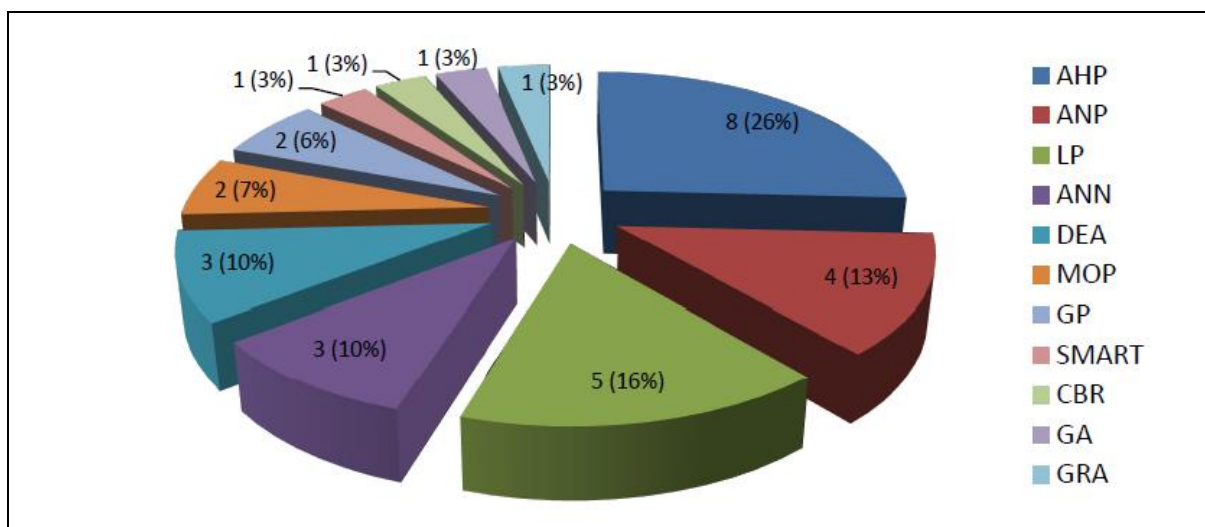


Figure 2-4: MCDM Models (Yildiz and Yayla, 2015)

2.6 Conclusion

Outsourcing is a common approach for organisations to gain competitive advantage and the demand for outsourcing is increasing rapidly. Outsourcing is a complex process that includes trust and security issues. Despite all the advantages outsourcing provides to the organisations, outsourcing is not a cure for every organisation, but it is a useful tool to assist some organisations to compete more effectively, if planned and implemented correctly.

Organisations need to realise that there are many steps to consider when opting for the outsourcing route. There are many outsourcing options to consider. When choosing to outsource, there is a need to decide which type of outsourcing method suits the organisation. The organisation must also look at the main reasons for outsourcing and which activities should be outsourced. The literature analysed the risks and benefits of outsourcing. The alliance between the client organisation and the vendor is also very important. The client and vendor must have a common understanding. For outsourcing to be successful in an organisation, better managing of relationships and contracts must be maintained. If the client-vendor relationship does not grow into a partnership, then there may be problems experienced in these cases. Contracts must also be clearly defined to rule out any uncertainty with the job at hand. According to the literature, there hasn't been a sufficient decision making processes available from research carried out in South Africa. This research will help client organisations make informed decisions when choosing an outsourcing vendor. This will also assist some organisations with the risks or problems they are currently experiencing.

It is imperative to choose the right vendor, but the choice of the correct model is likewise critical. It is important to choose a potential vendor that will add value to the client organisation by saving on cost and enhancing the revenue. Vendor selection deals with multiple criteria therefore in this research the MCDM was chosen. Comparisons of the different methods in MCDM were discussed in the literature. The literature further analysed the different MCDM methods.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter presents the overall research design, data sampling and data collection techniques that constitute the research methodology of the study. Furthermore, the statistical methods used for the analysis of the variables of the study are discussed. The research methodology is a master plan of action that begins with the definition of research questions, the selection of appropriate variables for the study, the methods of collecting the desired data and analysis for accurate results. The research methodology followed in this study is based on the following 5 steps:

Step 1:

Determination of IT outsourcing criteria, achieved from the literature. An iterative search was conducted until the most suitable criteria were found.

Step 2:

Validation of IT outsourcing criteria, achieved from the data analysis.

Step 3:

Determination of a suitable MCDM method for IT outsourcing. Comparisons of the different methods in MCDM were discussed in Chapter Two. The chapter further analysed the different MCDM methods. After a comparative analysis of the different methods, the researcher found that using AHP would be the best option in developing a suitable method for the selection of a vendor. A constant search was conducted by the most suitable method was found.

Step 4: Determination of suitable MCDM software for ranking IT outsourcing vendors.

Comparisons of the different Analytic Hierarchy Process Software were conducted. The AHP software MakeItRational TM/_®/_© was chosen as the most suitable software for this research. An iterative search was conducted until the most suited software tool was found.

Step 5: Comparison of criteria ranking

Steps 4 and 5 (validation and testing) will be covered in the next chapter. The client questionnaire was analysed with the AHP software MakeItRational™/®/©. The multiple criteria from the client questionnaire will be ranked from highest to lowest. The vendor questionnaire will be analysed with MakeItRational™/®/©. The ranked multiple criteria and the data from the vendor questionnaire will then be fed into the MakeItRational™/®/© software and the final ranking of the three vendors will be conducted. Figure 3-1 summarises the decision making process for selecting ITO vendor.

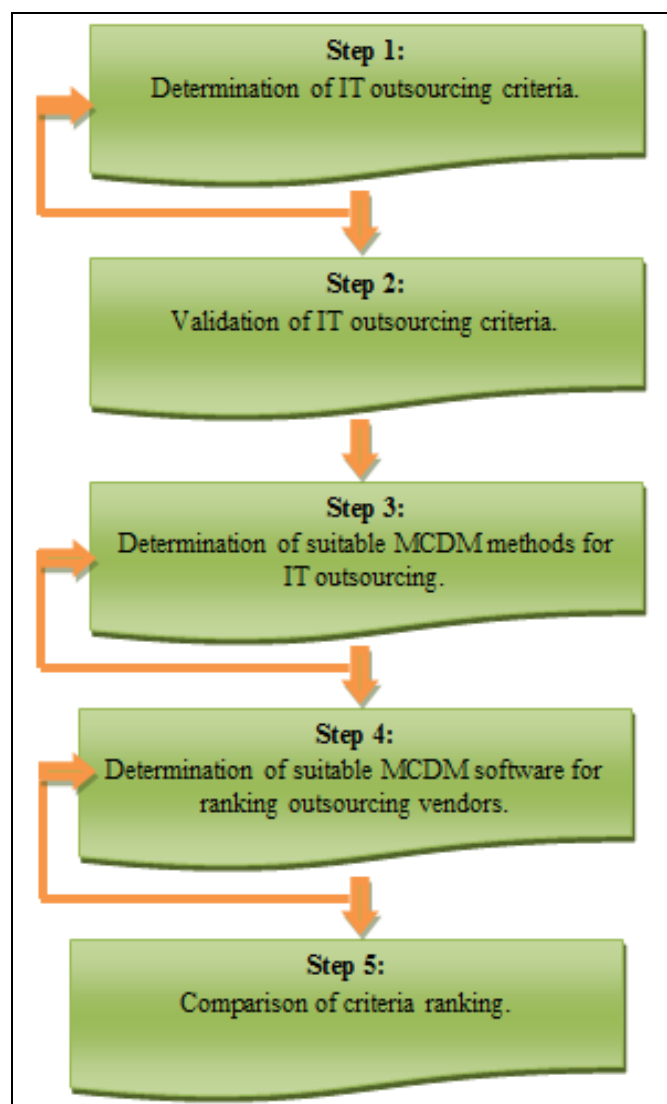


Figure 3-1: Decision Making Process for Selecting IT Outsourcing Vendor

The primary research question is: what is an appropriate decision making process can be developed for guiding vendor selection in IT outsourcing?

3.1 Determination of IT Outsourcing Criteria

Park and Park (2016) state that qualitative research involves several techniques such as observations, interviews and perusal of historical data. Qualitative research relates to social or human problems. This research type analyses questions and procedures that have emanated from the participants in the natural environment. Qualitative research focuses on interpretation and observations of the participants. According to Creswell (2013) the views of the participants' topics are analysed by the researcher. The researcher then collects the participants' data. Finally, the data is interpreted by the researcher.

According to Park and Park (2016), quantitative research entails the researcher acquiring large samples by means of surveys, telephone exchanges, mail usage and face-to-face dialogue. Creswell (2013) further avers that this research method analyses differing variables and relationships which are tested. These variables are measured by the use of certain instruments. The outcome is data that are calculated and presented statistically (Creswell, 2013). McCusker and Gunaydin (2015) conclude that instruments in the form of equipment and/or questionnaires are used to collect numerical data. They further agreed that data is in numerical and statistical formats.

The mixed-method approach involves a combination of qualitative and quantitative research data, which is believed to provide a holistic approach (Creswell, 2013; Doucerain, Vargas and Ryder, 2016). According to Park and Park (2016), both research methods involve similar outputs, which cohesively bring out the distinctive qualities to the research approach. In this research, questionnaires were used to gather data from the client and the vendor, which adopted a quantitative approach. The group of respondents were small, where a qualitative approach was also necessary. The researcher therefore adopted a mixed-method approach, utilising both.

A study of the literature has revealed that vendor selection deals with client organisations needing to evaluate multiple criteria when choosing an ITO vendor. The evaluation of multiple criteria can be very challenging, where one has to select and rate from

a list of competing criteria. This research is based on a comparative evaluation of vendor selection processes in different corporate environments using the MCDM method. An analysis of the different MCDM methods during the literature study in Chapter Two revealed that using an AHP method will be most appropriate. AHP is not used to replace human judgement, but rather human judgement is important, because it constitutes the core input in the evaluation process. Factors that are quantitative or qualitative are taken into account by AHP.

3.2 Validation of IT Outsourcing Criteria

The researcher found questionnaires to be more suitable for this research, considering that the managers and directors have demanding jobs and time is of the essence. Another problem faced by the researcher was the location of some of the clients and vendors, who are located in outer-lying areas.

Two types of questionnaires were distributed, namely: a client questionnaire and a vendor questionnaire. The client questionnaire (Annexure A) provided general information, however, the criteria rating information provided was extracted and fed into the software for ranking. The vendor questionnaire (Annexure B) provided the criteria rating from their perspective.

In this study the questionnaire was designed on the basis of the literature review in Table 3-1 that cater for the challenges and risks associated with outsourcing, as introduced in Chapter One, sections 1.1 and 1.2, respectively.

Table 3-1: Criteria for the Questionnaire

CRITERIA	REFERENCES
1) Management can concentrate on their core activities of their business	Ha and Krishnan (2008); King (2004); Dibbern <i>et al.</i> (2004); Halvey and Melby (2005)
2) Client organisations do not have full control of the business process	Currie (2000); Faisal & Raza (2016); King and Torkzadeh (2008)
3) Vendors sometimes do not have a good understanding of the client's organisation	Lee and Kim (1999); Sharma <i>et al.</i> (2008)
4) Some vendors may need to be constantly monitored	McFarlan and Nolan (1995); Stralkowski and Billion (1988); Stuart <i>et al.</i> (2012)
5) The vendor needs to understand the organisational structure	Lee <i>et al.</i> (1999)
6) Quality of work increases as experts are handling the tasks	Palvia (2002); Dibbern <i>et al.</i> (2004)
7) Work is carried out more quickly and effectively	Pfannenstein and Tsai (2004)
8) There are no regular meetings with the vendor	King (2005); Mann <i>et al.</i> (2015)
9) Additional resources	Feeny <i>et al.</i> (2005); Wadhwa and Ravindran (2007)
10) Additional expertise	Dibbern <i>et al.</i> (2004); Feeny <i>et al.</i> (2005)
11) Cost	Choudhury (2016); Ha and Krishnan (2008); Jain and Khurana (2016); Pourkiani and Hammzei (2015); Pfannenstein and Tsai (2004); Wadhwa and Ravindran (2007); Lacity and Hirschheim (1993); Khan and Lacity (2012)
12) Quality	King and Torkzadeh (2008); Choudhury (2016); Pourkiani and Hammzei (2015); Wadhwa and Ravindran (2007); Jain (2013)
13) Trust	Nguyen <i>et al.</i> (2006); Goles and Chinn (2005); King and Torkzadeh (2008); Gritzalis <i>et al.</i> (2007); McFarlan and Nolan (1995); Lioliou and Willcocks (2009); Stralkowski and Billion (1988)
14) Communication	Goles and Chinn (2005); Jain and Khurana (2016)
15) Commitment	Goles and Chinn (2005); Lioliou and Willcocks (2009)
16) Prompt delivery	Choudhury (2016); Pourkiani and Hammzei (2015); Pfannenstein and Tsai (2004); Wadhwa and Ravindran (2007); Lacity and Hirschheim (1993)
17) Contract terms	Goo <i>et al.</i> (2000); Lioliou and Willcocks (2009); Ketler and Willems (1999)
18) Location	King (2008); Aruldoss <i>et al.</i> (2013)
19) Prior Work	Faisal and Raza (2016)
20) Confidentiality	Khan and Lacity (2012); Gritzalis <i>et al.</i> (2007)
21) On Supplier Database	Faisal and Raza (2016)
22) BEE	Akinsomi <i>et al.</i> (2015); Botha and Sartorius (2008)

3.2.1 Data Collection Instruments

3.2.1.1 Client Questionnaire

The client questionnaire dealt with:

- 1) **The organisation** that is currently outsourced. The questions focused on the current job title of the respondent, the nature of the organisation, and the different functions

the organisation outsources. The objective of this section is to gain information about the respondent and the organisation.

- 2) **Why and how** organisations are currently outsourcing. The questions focused on the methods that were used to choose an appropriate vendor, the methods that were used during the tender process and reasons and advantages of outsourcing.
- 3) Dealt with **the relationship** between the organisation and the ITO vendor. The questions focused on how often the ITO vendor and management meets, management's areas of improvement regarding the relationship with their vendor/s, the disadvantages of outsourcing, ascertaining whether their current methodology of outsourcing is workable, and the criteria used in choosing a vendor.

3.2.1.2 Vendor Questionnaire

The vendor questionnaire will assist in determining the most important criteria in this research that the client organisations will seek to fulfil their needs when selecting an ITO vendor. This questionnaire comprised one section. The vendor was requested to rate the criteria from most important to least important. Various criteria were stipulated on the vendor questionnaire. These were as follows: 1) cost; 2) quality; 3) commitment; 4) additional resource; 5) additional expertise; 6) prior work; 7) contract terms; 8) confidentiality; 9) location; 10) on supplier database; and 11) black economic empowerment. The rating values on the questionnaire could only be selected once for each criterion.

3.2.2 Target Population

The target population included organisations outsourcing all or some of its IT functions. The organisations were from governmental and private sector. Specifically the following categories were targeted: 1) higher education; 2) health; 3) inspection and testing; 4) property; 5) local government authority; 6) state owned enterprises; 7) storage companies; 8) shipping companies; and 9) transportation. The client questionnaires were distributed to managers or directors for completion. The vendor questionnaires were distributed to IT managers or directors for completion. The reason managers or directors were chosen is due to

them having a wider insight of their organisation hence being able to provide sufficient information.

3.2.3 Sample Size

The client questionnaires were distributed to organisations in KwaZulu-Natal, Gauteng and the Western Province, South Africa. These organisations were not IT organisations, but outsourced all or part of their IT functions. Organisations that are currently outsourcing were analysed with respect to their selection of an ITO vendor. In total, 21 client questionnaires (Annexure A) were dispatched, and 16 were returned. ITO vendors were then consulted for this research. These were the vendors who provided their services to clients that participated in the client questionnaires. In total, 5 vendor questionnaires (Annexure B) were dispatched and 3 were returned. Although the sample size is small, the respondents are a concentrated group of selected individuals, who are experts in the outsourcing industry.

3.2.4 Procedure of the Questionnaire

The questionnaire was either hand delivered, or e-mailed to each of the respondents. The respondents were given two weeks to fill out the questionnaire. The data was captured from these questionnaires and was analysed to the best practices on the outsourcing vendor selection.

3.2.5 Ethical Consideration

The respondents were assured that the information provided would be kept confidential, as an informed consent form (Annexure E) was prepared and sent with the questionnaires. The consent form made the respondents aware that the participation is voluntary, and that he or she can withdraw from the study at any time. A cover letter (Annexure C) was attached to each questionnaire, which served to introduce the name of the researcher, the name of the supervisor, name of the institution supporting the research, the purpose of the study and the respondents' participation is voluntary.

An ethical clearance form (Annexure D) was attached to each questionnaire.

It is important to note that the questionnaires did not request the respondent's name, ID number, address or any other information that could identify the respondent. This helped in keeping all information collected confidential.

3.3 Determination of a suitable MCDM method for IT Outsourcing

According to Forman and Peniwati (1998), AHP is constructed on human ability to categorise ideas in a tiered format (hierarchical). AHP also compares aspects which are similar to one another against stipulated criterion or items which have commonality. Moreover, AHP is capable of judging the intensity of the importance of one item over another. Finally, all judgements are synthesised using the framework provided by the hierarchy, such that the overall priorities of the elements are obtained. Saaty (2000) highlighted that the AHP is an excellent process, but notes that the way it was designed was to accommodate our human nature, rather than changing us into another mode when making a decision. It was designed to allow for multiple revisions.

Petkov and Viljoen (1994) described the AHP method permitting DMs to show qualitative and quantitative criteria. AHP is a hierarchical structure, which permits responsibilities to be separated for the judgements associated with it between varying management levels. This allows for easy propagation of managerial policies from the higher levels to lower levels of management, which constitutes a worthy feature of the AHP.

Saaty (1990) also highlighted that the strength of AHP is the pairwise comparison and the influence the upper levels have over the lower levels, due to the two variables of the same level being compared at any time to a variable at an upper level, which makes the process much easier.

The method devised by Saaty (1980) stated that the main focus of AHP is the method of converting subjective assessments of relative importance to a set of overall scores or weights.

Saaty (2008) argued that to make a decision systematic approach to achieve priorities, we need to break down the decision into the following steps:

- 1) Find out what the problem is and then find out the kind of information needed;
- 2) Form a hierarchy with the main goal of the decision on the top. The next level must contain the criteria and the level below must contain the sub-criteria for each criterion;
- 3) Formulate a set of pairwise comparison matrices, where each element in the above level is used to compare the elements in the level below it; and
- 4) Use the priorities obtained from the comparisons to weigh the priorities in the level below. This must be done for every element, where for each element in the level below, one is required to add its weighed values. Thereafter, it is necessary to obtain its overall or global priority. This process of weighing and adding must be continued until the final priorities of the alternatives in the bottom most level is obtained.

The Table 3-2 is taken from Saaty (2008) and he explains the fundamental scale of absolute numbers.

Table 3-2: Fundamental Scale of Absolute Numbers (Saaty, 2008)

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities equally to the objective
2	Weak or slight	
3	Moderate importance	Experience and judgement slightly favour one activity over another.
4	Moderate plus	
5	Strong importance	Experience and judgement strongly favour one activity over another.
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favoured very strongly over another; its dominance demonstrated in practice.
8	Very, very strong	
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values between adjacent scale values	When compromise is needed
Reciprocals of above nonzero	If activity <i>i</i> has one of the above nonzero numbers assigned to it when compared to activity <i>j</i> , then <i>j</i> has the reciprocal value when compared with <i>i</i> .	A reasonable assumption
Rationales	Intermediate values between adjacent scale values	When compromise is needed

According to Saaty (2008), AHP is a research model that breaks down a problem into a hierarchical model. As can be seen in Figure 3-2, the AHP model is represented as a tree structure. The upper segment of the hierarchy represents the overall goal, where the nodes directly below the upper segment correspond to the different criteria and the leaves of the hierarchy tree represents the alternatives. The pairwise comparison (PC) method is used assesses the importance of the criteria and alternatives. All nodes are evaluated. The aggregated importance of the alternatives is then calculated. A solution or ranking is then obtained, which is known as the preference vector.

Two elements are compared at a given time using PC in order to assess the importance of the criteria and the alternatives. The value (either subjective or objective in origin) assigned to this comparison can represent the direction of preference amongst these elements as well as their relative strengths. By the use of the judgements, a matrix is formed for each criterion. Consequently, the preference vector, which contains each element's weight, is formed by using the elicitation method.

According to Erkut and Tarimcilar (1991), DMs are not fully confident regarding their judgements assigned to each comparison. The authors further postulate that the judgements could be subjective, or could originate from multiple members, with differing opinions related to each criterion. A SA can run on the results in analysing the sensitivity in the solution due to changes in input data. SA is a tool used to assess the changes in the preference vector as a result of changes in the weights of the criteria or PC judgements (Chen and Kocaoglu, 2008).

A decision making process of preferred features for this software model will be constructed and software tools will be analysed according to this decision making process. The main objective of this decision making process is to assess the potential of AHP software to deliver a set of pertinent features, which are necessary to provide a satisfactory solution to a decision making problem, and the identification of potential improvements that may assist the DM in making more informed decisions.

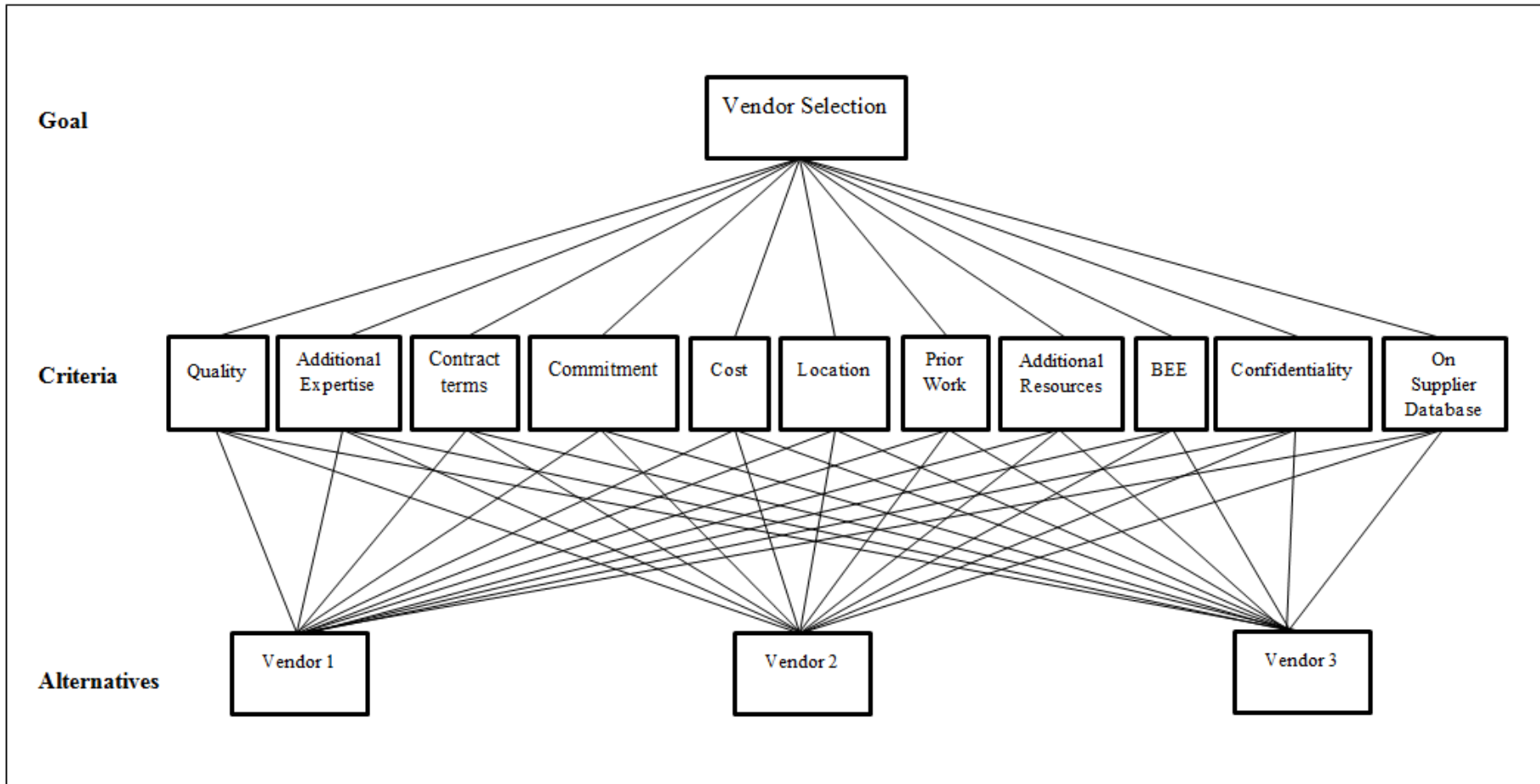


Figure 3-2: Vendor Selection

3.4 Determination of a suitable MCDM software for ranking IT Outsourcing Vendors

There are a number of different kinds of analytical software available. The researcher analysed the IMPERIA Project Report (Mustajoki and Marttunen, 2013). The report consisted of a comparison of multi criteria decision analysis software and the features they possess. This report consisted of 24 software or resource collections. They focused on software that has been used actively. The researcher analysed the following five of the most used/popular forms of software from the report.

Table 3-3: Different Analytic Hierarchy Process Software (Mustajoki and Marttunen, 2013)

Software	Vendor's description
1000Minds TM / _® / _©	Assists with decision making; Allows for any number of participants Allows for group decision making activities
DecideIT TM / _® / _©	Assists in reliable risk and decision analyses Handles complex decisions Consists of decision trees and criteria hierarchies
Decision Tools TM / _® / _©	Allows for risk analysis and decision making under uncertainty
TESLA TM / _® / _©	Assists to support decision makers Breaks down a decision into a hierarchical structure Does not automate the decision making process
MakeItRational TM / _® / _©	Assists in decision support based on the AHP Organises and simplifies decision making Supports complex and tough decisions

1000Minds TM/_®/_© is software that assists with decision making, allowing for any number of participants and group decision making. In the model construction, this software is not a hierarchical model, it does have consequences table, and it does not provide visual scoring. In the criteria weighting, it does not have visual weighting, but has AHP/pairwise comparison. In the analysis of results, it does have visual graphs, it does have overall values and has SA.

DecideIT TM/_®/_© assists in reliable risk and decision analyses, handles complex decisions, and consists of decision trees and criteria hierarchies. In the model construction, this software is a hierarchical model, it does not have consequences table, and it does provide visual

scoring. In the criteria weighting, it does have visual weighting and has AHP/pairwise comparison. In the analysis of results, it does have visual graphs, it does have overall values and has SA.

Decision Tools ^{TM/®/©} allow for risk analysis and decision making in cases of uncertainty. In model construction, this software is a hierarchical model, it does have a consequences table, and it does provide visual scoring. In the criteria weighting, it does not have visual weighting and does not have AHP/pairwise comparison. In the analysis of results, it does have visual graphs, it does not have overall values, and does have SA.

TESLA ^{TM/®/©} assists to support DMs, breaks down a decision into a hierarchical structure, and does not automate the decision making process. In the model construction, this software is a hierarchical model, does not have consequences table, and provides visual scoring. In the criteria weighting, it does have visual weighting and has AHP/pairwise comparison. In the analysis of results, it does have visual graphs, it does have overall values, and does have SA.

MakeItRational ^{TM/®/©} assists in decision support based on the AHP, organises and simplifies decision making, and supports complex and tough decisions. In the model construction, this software is a hierarchical model, it does have consequences table, and it does provide visual scoring. In the criteria weighting, it does have visual weighting, and has AHP/pairwise comparison. In the analysis of results, it does have visual graphs, it does have overall values, and does have SA.

Refer to Table 3-4, which defines the capabilities of the various software tools discussed.

Table 3-4: Analytic Hierarchy Process Software Capabilities

Software	Hierarchical model	Consequences table	Visual scoring	Visual weighting	AHP/pairwise comparison	Visual graphs	Overall values	Sensitivity analysis
1000Minds		X			X	X	X	X
DecideIT	X		X	X	X	X	X	X
Decision Tools	X	X	X			X		X
TESLA	X		X	X	X	X	X	X
MakeItRational	X	X	X	X	X	X	X	X

The researcher analysed the software tools above and concluded that MakeItRational™/®/© is the most suited software for this study. MakeItRational™/®/© possesses all that is required in this research when compared to the other software. This software is able to perform all of the tasks referred to in Table 3-4, whereas the other software tools have limitations in their capabilities. It is for this reason that MakeItRational™/®/© is the preferred software tool for this research.

MakeItRational™/®/© is a software tool which organises the process of multiple criteria evaluation of segmentation of judgements. Each judgement is relative to a small and well defined extract of the decision problem. Alternatives are examined at differing angles when making judgements and establish the relative importance of the criteria. PC or direct ratings are examples of judgements with differing forms (MakeItRational, 2013).

MakeItRational™/®/© does not use predefined algorithms, but rather, it collects, combines and analyses judgements that reflects the mindset of the evaluator. The evaluators' mindset comprises of experience, objectives, knowledge, opinions, values and priorities. One may still be able to provide physical data, however MakeItRational™/®/© illustrates the interpretation of data through its lens of expertise, and subsequently makes judgements (MakeItRational, 2013). According to Pegetti and De Souza (2014), the main aim of their research was to assist private higher education institutions to make structured decisions in vendor selection. The authors used MakeItRational™/®/© as one of its tools to assess alternatives and criteria through the AHP (Pegetti and De Souza, 2014). It must be noted that this study proved to be highly successful in its supply chain management, proving the effectiveness of MakeItRational™/®/©. Therefore, MakeItRational™/®/© is a suitable software tool for this research.

3.5 Comparison of Criteria Ranking

The data collected from the client questionnaires and vendor questionnaires were analysed by the AHP software. The results were presented in the form of graphs, cross tabulation and other figures. The ranking results are presented in Chapter Four.

3.6 Conclusion

This research aims to assist client organisations in the vendor selection process in different corporate environments. The approach that the researcher used is the MCDM. The literature revealed that selection of vendor deals with client organisations looking at multiple criteria when choosing an ITO vendor. The researcher analysed the various MCDM software and the AHP was chosen as the most appropriate. A more detailed analysis of the structure of the AHP was conducted with respect to this research. The researcher has focused on 11 criteria that were investigated in this research. The mixed-method approach was used as this methodology involved a combination of qualitative and quantitative methods. Due to time and location challenges, questionnaires were the preferred choice to collect the data. The researcher analysed the literature and tabulated some of the criteria that were used to design the questionnaire. Client and vendor questionnaires used to collect the data were tailor made with the objective to allow an organisation to select the preferred vendor. The organisations chosen were from governmental and private sector, with the aim to provide a broader analysis. Various AHP software tools were analysed and MakeItRational™/®/© remained the preferred choice.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter focuses on the presentation and discussion of the results of this study. The chapter is broken down into different sections, namely: 1) demographic results which entails an overview of the client organisations; 2) why and how organisations outsource IT services which entails the main reasons for outsourcing, frequency in meeting with the vendor, improves in the relationship, the disadvantages of outsourcing and rating of the criteria; 3) results of the criteria importance, which entail the ranking of the multiple criteria from the client organisation; and 4) results of ranking ITO vendors, which entail the ranking of multiple criteria from the vendor organisation. The inputs from the client and vendor organisations were inputted into MateItRational, where a final vendor ranking was displayed.

4.1 Demographic Results

This section summarises the biographical characteristics of the respondents and their organisations. The questions focused on the current job title of the respondent, the nature of the organisation, the different functions the organisation outsources, the methodology used to choose an appropriate vendor and the methods that were used during the tender process.

4.1.1 The positions (by job title)

This question examines the different job titles of the respondents. Table 4-1 illustrates the varied nature of the respondents. This was done to obtain respondents from specialist positions within their organisations. It was envisaged that the broad spectrum of respondents to the questionnaire would give a more realistic overview of their organisation's approach to outsourcing. It can be observed from Table 4-1 that most of the respondents were from senior management. 'Directors' received 2 responses, whilst 1 response each were received from the 'IT director'; 'managing director'; 'CEO'; 'finance manager'; 'ICT manager'; 'IT manager'; and 'procurement manager', respectively. Local weights are defined as the weight of each criterion within its own section of the hierarchy. Global weights are based on the contribution that each criterion makes to the overall result. MakeItRational TM/_®/_© reflects local weights

as equal to the global weights due to sub criteria being absent. This is reflected in all tables which follow.

Table 4-1: Clients Job Title

Criterion	Global Weight [%]	Local Weight [%]
Director	12.5	12.5
CEO	6.3	6.3
Engineer	6.3	6.3
Engineering Superintendent	6.3	6.3
Estate Agent	6.3	6.3
Finance Manager	6.3	6.3
HOD – Procurement	6.3	6.3
ICT Manager	6.3	6.3
IT Director	6.3	6.3
IT Manager	6.3	6.3
Managing Director	6.3	6.3
MMI Product/Strategic Exec	6.3	6.3
Payroll Administrator	6.3	6.3
Procurement Manager	6.3	6.3
Tax Practitioner	6.3	6.3

Key: 6.3% represents 1 response; 12.5% represents 2 responses

4.1.2 The nature of the organisations

This question examines the nature of the clients’ core business. Table 4-2 illustrates the varied nature of the organisations, which have participated in this questionnaire. Responses were received from ‘higher education’; ‘health’; ‘inspection and testing’; and ‘property consortiums’ which were each represented by 1 response. No responses were received from ‘local government authority’; ‘state owned enterprises’; ‘storage companies’; ‘shipping companies’; and ‘transportation’, which limited this study.

Table 4-2: Nature of the Organisations

Criterion	Global weight [%]	Local weight [%]
Health	15.4	15.4
Higher Education	15.4	15.4
Inspection and Testing	15.4	15.4
Local Government Authority	7.7	7.7
Property	15.4	15.4
Shipping	7.7	7.7
State Owned Enterprise	7.7	7.7
Storage	7.7	7.7
Transportation	7.7	7.7

Key: 15.4% represents 1 response; 7.7% represents 0 responses

The respondent was given the option ‘other’ in addition to those that were provided in Table 4-2. Table 4-3 refers to the responses received from ‘other’, which illustrates the varied nature of the organisations. Multiple responses were allowed, not initially provided in the questionnaire. This was done to obtain organisations from various industry sectors that provide an intricate and in-depth response rate for the purpose of this study. Fast Moving Consumer Goods (FMCG) received 2 responses whilst 1 response each was received from the balance of the organisations. It must be noted that FMCG are also associated with the nature of the other organisations hence cannot be deemed to be isolated.

Under ‘other’ these were the following: 1) ‘actuarial consulting’; 2) ‘chemical manufacturers’; 3) ‘chemicals and engineering consultants’; 4) ‘chrome smelter’; 5) ‘electrical contractors’; 6) ‘finance’; 7) ‘FMCG’; 8) ‘freight company’; 9) ‘insurance company’; 10) ‘payroll company’; 11) ‘petrochemical manufacturing company’; and 12) ‘wholesale and distribution company’.

Table 4-3: Nature of the Organisations (Other)

Criterion	Global Weight [%]	Local Weight [%]
Actuarial Consulting	7.7	7.7
Chemicals	7.7	7.7
Chemicals + Engineering	7.7	7.7
Chrome Smelter	7.7	7.7
Electrical contractors	7.7	7.7
Finance	7.7	7.7
FMCG	15.4	15.4
Freight	7.7	7.7
Insurance	7.7	7.7
Payroll company	7.7	7.7
Petrochemical	7.7	7.7
Wholesale and distribution	7.7	7.7

Key: 15.4% represents 2 responses; 7.7% represents 1 response

4.1.3 The functions that the organisations outsource

This question examined functions that the organisations outsource. Table 4-4 illustrates the varied functions that the organisations outsource. This was done to obtain information on the different type of functions that the organisations outsource. Multiple responses were allowed.

These outsourced functions are as follows: ‘payroll services’ (4 responses); ‘off-site backup’ (7 responses); ‘company website design/hosting’ (11 responses); ‘IT support/training’ (9 responses); ‘recruitment’ (1 response); ‘credit control’ (1 response); and ‘computer and hardware purchasing’ (7 responses). This table shows outsourced functions, namely: ‘off-site

backup’; ‘company website design/hosting’; ‘IT support/training’; and ‘computer and hardware purchasing’ were popular as opposed to ‘payroll services’; ‘recruitment’; and ‘credit control’.

Table 4-4: Outsourced Functions

Criterion	Global weight [%]	Local weight [%]
Company Web Site Design/Hosting	27.5	27.5
Computer and Hardware Purchasing	17.5	17.5
Credit Control	2.5	2.5
IT Support/Training	22.5	22.5
Off-Site Backup	17.5	17.5
Payroll Services	10	10
Recruitment	2.5	2.5

Key: 27.5% represents 11 responses; 22.5% represents 9 responses; 17.5% represents 7 responses; 10% represents 4 responses; 2.5% represents 1 response

Table 4-5 further illustrates ‘other’ outsourced functions specified by the respondents. The outsourced function was not initially provided in the questionnaire. Multiple responses were allowed. One response each was received from the respondents who selected ‘other’. Below ‘other’, these were the following from the respondents: 1) ‘compliance + core system design’; 2) ‘core system updating’; 3) ‘courier services + repairs and maintenance’; 4) ‘engineering services’; 5) ‘financial services, including Procure to Pay (PTP) + financial services including Month End Processes (MEP) + financial servicing including other Back Office Finance (BOF)’; and 6) ‘workstation support + network support + call desk’.

Table 4-5: Outsourced Functions (Other)

Criterion	Global weight [%]	Local weight [%]
Compliance	14.3	14.3
Core System Design + Core System Updating	14.3	14.3
Courier Services + Repairs and Maintenance	14.3	14.3
Engineering Services	14.3	14.3
Financial Services including PTP + MEP + other BOF	14.3	14.3
Workstation Support + Financial Services including PTP	14.3	14.3
Workstation Support + Network Support + Call desk	14.3	14.3

Key: 14.3% represents 1 response;

4.1.4 Does your organisation use the tender process to select an appropriate IT outsourcing vendor?

This question is designed to determine whether the client uses the tender process during selection. Table 4-6 illustrates that from the 16 respondents, 8 respondents indicated that they use the tender process, with an equal amount indicating that they do not use the tender process when selecting an outsourcing vendor. Based on these results, it is evident that organisations require assistance in vendor selection. This is due to 50% of the organisations eliminating the tender process.

Table 4-6: Does the Organisation use the Tender Process

Criterion	Global weight [%]	Local weight [%]
No	50	50
Yes	50	50

Key: 50% represents 8 responses

4.1.5 The method that is used to select the best vendor

Table 4-7 illustrates the methods used during the tender process to select the best-suited vendor. Multiple responses were allowed by the respondent. The following methods were provided: ‘decision support system’ (2 responses); ‘group decisions’ (3 responses); ‘evaluation by elimination’ (2 responses); ‘evaluation models’ (3 responses); and ‘evaluation by elimination and evaluation models’ (3 responses). This shows ‘group decisions’, ‘evaluation models’ and ‘evaluation by elimination and evaluation models’ were more popular as opposed to ‘decision support system’ and ‘evaluation by elimination’.

Table 4-7: Tender Process Method

Criterion	Global weight [%]	Local weight [%]
Decision Support System	12.5	12.5
Evaluation by Elimination	12.5	12.5
Evaluation by Elimination and Evaluation Models	25	25
Evaluation Models	25	25
Group Decisions	25	25

Key: 25% represents 3 responses; 12.5% represents 2 responses

Table 4-8 illustrates ‘other’ tender process methods that were not initially provided in the questionnaire. Table 4-8 illustrates other methods used during the tender process to select the best suited vendor. Only 2 respondents answered this question. One respondent chose ‘BEE requirements’ (1 response) only, whereas the other respondent chose ‘BEE Requirements + Technical + Price’ (1 response). It is noted that ‘BEE requirements’ appear in both of the responses.

Table 4-8: Tender Process Method (Other)

Criterion	Global weight [%]	Local weight [%]
BEE Requirements	50	50
BEE Requirements + Technical + Price	50	50

Key: 50% represents 1 response

4.2 Why and How Organisations Outsource IT Services

4.2.1 The Main Reasons for Outsourcing

This question analyses the main reasons for outsourcing, which comprised of 7 benefits, namely: 1) ‘cost effectiveness’; 2) ‘number of in-house expertise’; 3) ‘do not have necessary resources’; 4) ‘management can concentrate on their core activities’; 5) ‘quality of work increases as experts are handling the tasks’; 6) ‘work is carried out more quickly and more effectively’; and 7) ‘do not have to employ additional staff’. Each of the benefits was analysed separately, and their results are presented below.

4.2.1.1 Cost Effectiveness

Table 4-9 represents cost effectiveness. In ‘cost effectiveness’, 9 responses were received for ‘Strongly Agree’, and 7 responses were received for ‘Agree’. It is evident from the responses that a significant reason for outsourcing is saving on cost. Hans and Mithas (2013) and Nduwimfura and Zheng (2016) also concluded that the introduction of ITO can assist in cost reduction.

Table 4-9: Cost Effectiveness

	Alternative	Score
<input checked="" type="checkbox"/>	Client 7	0.143
<input checked="" type="checkbox"/>	Client 6	0.143
<input checked="" type="checkbox"/>	Client 5	0.143
<input checked="" type="checkbox"/>	Client 3	0.143
<input checked="" type="checkbox"/>	Client 16	0.143
<input checked="" type="checkbox"/>	Client 14	0.143
<input checked="" type="checkbox"/>	Client 13	0.143
<input checked="" type="checkbox"/>	Client 10	0.143
<input checked="" type="checkbox"/>	Client 1	0.143
<input checked="" type="checkbox"/>	Client 9	0.114
<input checked="" type="checkbox"/>	Client 8	0.114
<input checked="" type="checkbox"/>	Client 4	0.114
<input checked="" type="checkbox"/>	Client 2	0.114
<input checked="" type="checkbox"/>	Client 15	0.114
<input checked="" type="checkbox"/>	Client 12	0.114
<input checked="" type="checkbox"/>	Client 11	0.114

Key: 0.143% represents ‘Strongly Agree’; 0.114% represents ‘Agree’

4.2.1.2 Number of In-House Expertise

Table 4-10 represents number of in-house expertise. In ‘number of in-house expertise’, 2 responses were received for ‘Strongly Agree’, 10 responses were received for ‘Agree’, and 3 out of 16 responses were received for ‘Neutral’. A client did not choose any option. It is evident from the responses that many of these organisations do not possess in-house expertise, as Corbett (2004) also posits that many organisations rely heavily on external expertise by increasingly outsourcing their IT services.

Table 4-10: Number of In-House Expertise

	Alternative	Score
<input checked="" type="checkbox"/>	Client 5	0.143
<input checked="" type="checkbox"/>	Client 1	0.143
<input checked="" type="checkbox"/>	Client 9	0.114
<input checked="" type="checkbox"/>	Client 8	0.114
<input checked="" type="checkbox"/>	Client 6	0.114
<input checked="" type="checkbox"/>	Client 3	0.114
<input checked="" type="checkbox"/>	Client 2	0.114
<input checked="" type="checkbox"/>	Client 14	0.114
<input checked="" type="checkbox"/>	Client 13	0.114
<input checked="" type="checkbox"/>	Client 12	0.114
<input checked="" type="checkbox"/>	Client 11	0.114
<input checked="" type="checkbox"/>	Client 10	0.114
<input checked="" type="checkbox"/>	Client 4	0.086
<input checked="" type="checkbox"/>	Client 16	0.086
<input checked="" type="checkbox"/>	Client 15	0.086
<input checked="" type="checkbox"/>	Client 7	

Key: 0.143% represents ‘Strongly Agree’; 0.114% represents ‘Agree’; 0.086 represents ‘Neutral’

4.2.1.3 Do not have the necessary resources

Table 4-11 represents do not have the necessary resources. In the ‘do not have the necessary resources’, 6 responses were received for ‘Strongly Agree’, 7 responses were received for ‘Agree’, 2 responses were received for ‘Neutral’ and 1 response was received for ‘Strongly Disagree’. It is evident from the responses that a majority of the respondents does not possess the necessary in-house resources, and in this regard, Feeny *et al.* (2005) have concluded that in order to evaluate a vendor, due understanding of the areas of expertise, such as resources, methods and values, must be considered.

Table 4-11: Do not have the necessary resources

	Alternative	Score
<input checked="" type="checkbox"/>	Client 7	0.143
<input checked="" type="checkbox"/>	Client 6	0.143
<input checked="" type="checkbox"/>	Client 5	0.143
<input checked="" type="checkbox"/>	Client 14	0.143
<input checked="" type="checkbox"/>	Client 12	0.143
<input checked="" type="checkbox"/>	Client 1	0.143
<input checked="" type="checkbox"/>	Client 9	0.114
<input checked="" type="checkbox"/>	Client 8	0.114
<input checked="" type="checkbox"/>	Client 3	0.114
<input checked="" type="checkbox"/>	Client 2	0.114
<input checked="" type="checkbox"/>	Client 16	0.114
<input checked="" type="checkbox"/>	Client 15	0.114
<input checked="" type="checkbox"/>	Client 11	0.114
<input checked="" type="checkbox"/>	Client 13	0.086
<input checked="" type="checkbox"/>	Client 10	0.086
<input checked="" type="checkbox"/>	Client 4	0.029

Key: 0.143% represents ‘Strongly Agree’; 0.114% represents ‘Agree’; 0.086 represents ‘Neutral’; 0.029 represents ‘Strongly Disagree’

4.2.1.4 Management can concentrate on their core activities

Table 4-12 represents management can concentrate on their core activities. In ‘management can concentrate on their core activities’, 10 responses were received for ‘Strongly Agree’, 5 responses were received for ‘Agree’, and 1 response was received for ‘Neutral’. It is evident from the responses that a significant number of the respondents prefer to concentrate on their core activities, as Ha and Krishnan (2008) also stated that organisations prefer to concentrate on their core activities and leave some or all of its non core activities to the vendors. Halvey and Melby (2005) have further stated that outsourcing is the responsibility of the vendor when it comes to the non core organisational activities, hence, they concluded that the vendors possess the required expertise to carry out their duties.

Table 4-12: Management can concentrate on their core activities

	Alternative	Score
<input checked="" type="checkbox"/>	Client 9	0.143
<input checked="" type="checkbox"/>	Client 7	0.143
<input checked="" type="checkbox"/>	Client 6	0.143
<input checked="" type="checkbox"/>	Client 5	0.143
<input checked="" type="checkbox"/>	Client 4	0.143
<input checked="" type="checkbox"/>	Client 2	0.143
<input checked="" type="checkbox"/>	Client 15	0.143
<input checked="" type="checkbox"/>	Client 14	0.143
<input checked="" type="checkbox"/>	Client 13	0.143
<input checked="" type="checkbox"/>	Client 1	0.143
<input checked="" type="checkbox"/>	Client 8	0.114
<input checked="" type="checkbox"/>	Client 3	0.114
<input checked="" type="checkbox"/>	Client 16	0.114
<input checked="" type="checkbox"/>	Client 12	0.114
<input checked="" type="checkbox"/>	Client 11	0.114
<input checked="" type="checkbox"/>	Client 10	0.086

Key: 0.143% represents ‘Strongly Agree’; 0.114% represents ‘Agree’; 0.086 represents ‘Neutral’

4.2.1.5 Quality of work increases as experts are handling the tasks

Table 4-13 represents the quality of work increases as experts are handling the tasks. In ‘quality of work increases as experts are handling the tasks’, where 7 responses were received for ‘Strongly Agree’, 7 responses were received for ‘Agree’, and 1 response was received for ‘Neutral’. Meanwhile, a response was not received from 1 client. It is evident from the responses that the majority of the respondents believed that the quality of the work increases as experts are handling the tasks. Dibberns *et al.* (2004) have also highlighted that ITO vendors were more knowledgeable in the IT stream, hence their work will be more efficient than it being handled internally. Chang and Gurbaxani (2012) posit that a vendor will produce more efficient results in service delivery due to their IT knowledge, when compared to the client.

Table 4-13: Quality of work increases as experts are handling the tasks

	Alternative	Score
<input checked="" type="checkbox"/>	Client 6	0.143
<input checked="" type="checkbox"/>	Client 5	0.143
<input checked="" type="checkbox"/>	Client 15	0.143
<input checked="" type="checkbox"/>	Client 14	0.143
<input checked="" type="checkbox"/>	Client 13	0.143
<input checked="" type="checkbox"/>	Client 12	0.143
<input checked="" type="checkbox"/>	Client 1	0.143
<input checked="" type="checkbox"/>	Client 9	0.114
<input checked="" type="checkbox"/>	Client 8	0.114
<input checked="" type="checkbox"/>	Client 4	0.114
<input checked="" type="checkbox"/>	Client 3	0.114
<input checked="" type="checkbox"/>	Client 2	0.114
<input checked="" type="checkbox"/>	Client 16	0.114
<input checked="" type="checkbox"/>	Client 10	0.114
<input checked="" type="checkbox"/>	Client 11	0.086
<input checked="" type="checkbox"/>	Client 7	

Key: 0.143% represents ‘Strongly Agree’; 0.114% represents ‘Agree’; 0.086 represents ‘Neutral’

4.2.1.6 Work is carried out more quickly and more effectively

Table 4-14 represents the work is carried out more quickly and more effectively. In ‘work is carried out more quickly and more effectively’, 7 responses were received for ‘Strongly Agree’, 6 responses were received for ‘Agree’, 2 responses were received for ‘Neutral’. Meanwhile, 1 client did not answer this option. It is evident from the responses that the bulk of the respondents believes that work is carried out more quickly and more effectively when activities are outsourced, as Pfannenstein and Tsai (2004) also stated that activities ought to be given to vendors, because they can do these activities better, and probably faster.

Table 4-14: Work is carried out more quickly and more effectively

	Alternative	Score
<input checked="" type="checkbox"/>	Client 6	0.143
<input checked="" type="checkbox"/>	Client 2	0.143
<input checked="" type="checkbox"/>	Client 15	0.143
<input checked="" type="checkbox"/>	Client 14	0.143
<input checked="" type="checkbox"/>	Client 13	0.143
<input checked="" type="checkbox"/>	Client 12	0.143
<input checked="" type="checkbox"/>	Client 1	0.143
<input checked="" type="checkbox"/>	Client 9	0.114
<input checked="" type="checkbox"/>	Client 8	0.114
<input checked="" type="checkbox"/>	Client 5	0.114
<input checked="" type="checkbox"/>	Client 4	0.114
<input checked="" type="checkbox"/>	Client 16	0.114
<input checked="" type="checkbox"/>	Client 10	0.114
<input checked="" type="checkbox"/>	Client 3	0.086
<input checked="" type="checkbox"/>	Client 11	0.086
<input checked="" type="checkbox"/>	Client 7	

Key: 0.143% represents ‘Strongly Agree’; 0.114% represents ‘Agree’; 0.086 represents ‘Neutral’

4.2.1.7 Do not have to employ additional staff

Table 4-15 represents do not have to employ additional staff. In ‘do not have to employ additional staff’, 5 responses were received for ‘Strongly Agree’, 8 responses were received for ‘Agree’, 2 responses were received for ‘Neutral’ and 1 response was received for ‘Disagree’. It is evident from the responses that most of the respondents believe that by outsourcing additional staff need not be employed. Nduwimfura and Zheng (2016) also elaborated that organisations believe that by outsourcing their IT they do not need to employee more staff and increase divisions and departments.

Table 4-15: Do not have to employ additional staff

	Alternative	Score
<input checked="" type="checkbox"/>	Client 7	0.143
<input checked="" type="checkbox"/>	Client 5	0.143
<input checked="" type="checkbox"/>	Client 14	0.143
<input checked="" type="checkbox"/>	Client 13	0.143
<input checked="" type="checkbox"/>	Client 1	0.143
<input checked="" type="checkbox"/>	Client 9	0.114
<input checked="" type="checkbox"/>	Client 8	0.114
<input checked="" type="checkbox"/>	Client 4	0.114
<input checked="" type="checkbox"/>	Client 3	0.114
<input checked="" type="checkbox"/>	Client 2	0.114
<input checked="" type="checkbox"/>	Client 15	0.114
<input checked="" type="checkbox"/>	Client 12	0.114
<input checked="" type="checkbox"/>	Client 10	0.114
<input checked="" type="checkbox"/>	Client 16	0.086
<input checked="" type="checkbox"/>	Client 11	0.086
<input checked="" type="checkbox"/>	Client 6	0.029

Key: 0.143% represents ‘Strongly Agree’; 0.114% represents ‘Agree’; 0.086 represents ‘Neutral’; 0.029 represents ‘Disagree’

The **main reasons for outsourcing**, the benefits ‘cost effectiveness’; ‘management can concentrate on their core activities’; and ‘quality of work increases as experts are handling the tasks’ were rated as most popular. ‘Strongly Agree’ and ‘Agree’ were the 2 most common options chosen.

4.2.2 The Frequency of Meetings with the Vendor

This question deals with how often the client and vendor meet illustrated in Table 4-16. Responses were received for all of the options provided. Some of the respondents chose more than one option. The highest frequency was ‘monthly’, with a rating of 33%. The second highest rating of 27% was for ‘quarterly’. The third highest rating of 20% was for ‘ad hoc’. A low rating of 13% was received for ‘yearly’. ‘Daily/weekly depending on needs’, had the lowest rating of 7%. It is evident from the information provided that the client/s does not wish to meet with the vendor as often as ‘daily/weekly depending on needs’, but still prefer meeting frequently to ensure targets are being met. ‘Monthly’, ‘quarterly’ and ‘ad-hoc’ are more popular, as opposed to the other 2 options. As stated by McFarlan and Nolan (1995), one of the most important problems associated with the successfulness of outsourcing relationships is monitoring the vendor’s performance constantly. The vendor may produce

good results at the beginning of the relationship, but this can slowly change if constant monitoring is not taking place. Therefore, King (2005) stressed that constant monitoring of progress ought to be included as one of the critical success factors in order for outsourcing to be effective.

Table 4-16: Meeting with the vendor

Criterion	Global weight [%]	Local weight [%]
Ad-hoc	20	20
Daily/Weekly depending on needs	6.7	6.7
Monthly	33.3	33.3
Quarterly	26.7	26.7
Yearly	13.3	13.3

4.2.3 The Factors that Respondents would like to Improve with their Vendors

This question provides options on what the client would like to see improvement with their vendor. There are 5 options in this question, namely: 1) ‘communication’; 2) ‘trust’; 3) ‘meeting more frequently’; 4) ‘prompt delivery’; and 5) ‘no improvements required, all requirements met’. Each of the options was analysed separately, with their results are presented below.

4.2.3.1 Communication

Table 4-17 represents communication. In ‘communication’, 2 responses were received for ‘Strongly Agree’, 9 responses were received for ‘Agree’, 1 response was received for ‘Neutral’, 1 response was received for ‘Disagree’, 1 response was received for ‘Strongly Disagree’ and 2 clients did not answer this option. It is evident from the responses that communication is pertinent in outsourcing hence Lui (2003) found poor communication has been one of the main reasons for client dissatisfaction in the client-vendor relationship. Jain (2013) also stressed that the vendor is encouraged to be culturally compatible so as to ensure effective communication.

Table 4-17: Communication

	Alternative	Score
<input checked="" type="checkbox"/>	Client 14	0.2
<input checked="" type="checkbox"/>	Client 1	0.2
<input checked="" type="checkbox"/>	Client 9	0.16
<input checked="" type="checkbox"/>	Client 8	0.16
<input checked="" type="checkbox"/>	Client 4	0.16
<input checked="" type="checkbox"/>	Client 3	0.16
<input checked="" type="checkbox"/>	Client 2	0.16
<input checked="" type="checkbox"/>	Client 16	0.16
<input checked="" type="checkbox"/>	Client 15	0.16
<input checked="" type="checkbox"/>	Client 11	0.16
<input checked="" type="checkbox"/>	Client 10	0.16
<input checked="" type="checkbox"/>	Client 13	0.12
<input checked="" type="checkbox"/>	Client 12	0.08
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 6	
<input checked="" type="checkbox"/>	Client 5	

Key: 0.2% represents ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.08 represents ‘Disagree’; 0.04 represents ‘Strongly Disagree’

4.2.3.2 Trust

Table 4-18 represents Trust. For ‘trust’, 4 responses were received for ‘Strongly Agree’, 4 responses were received for ‘Agree’, 3 responses were received for ‘Neutral’, 1 response was received for ‘Disagree’, 1 response was received for ‘Strongly Disagree’ and 3 clients did not answer this option. It is evident that 50% of the respondents will like trust to be improved with their vendor. Nguyen *et al.* (2006) found that vendors must not only be satisfied with trust that has been given to them by their client organisations, but that they must also work to strengthen that trust for ongoing business relationships, where trust is a key factor (Stralkowski and Billion, 1988).

Table 4-18: Trust

	Alternative	Score
<input checked="" type="checkbox"/>	Client 4	0.2
<input checked="" type="checkbox"/>	Client 15	0.2
<input checked="" type="checkbox"/>	Client 14	0.2
<input checked="" type="checkbox"/>	Client 1	0.2
<input checked="" type="checkbox"/>	Client 8	0.16
<input checked="" type="checkbox"/>	Client 3	0.16
<input checked="" type="checkbox"/>	Client 11	0.16
<input checked="" type="checkbox"/>	Client 10	0.16
<input checked="" type="checkbox"/>	Client 2	0.12
<input checked="" type="checkbox"/>	Client 16	0.12
<input checked="" type="checkbox"/>	Client 13	0.12
<input checked="" type="checkbox"/>	Client 12	0.08
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 9	
<input checked="" type="checkbox"/>	Client 6	
<input checked="" type="checkbox"/>	Client 5	

Key: 0.2% represents ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.08 represents ‘Disagree’; 0.04 represents ‘Strongly Disagree’

4.2.3.3 Meeting more frequently

Table 4-19 represents meeting more frequently. In ‘meeting more frequently’, 1 response was received for ‘Strongly Agree’, 4 responses were received for ‘Agree’, 5 responses were received for ‘Neutral’, 2 responses was received for ‘Disagree’, 1 response was received for ‘Strongly Disagree’, and 3 clients did not answer this option. As briefly discussed in section 4.2.2, the client does not wish to meet with the vendor as often, but still prefers some frequent meeting so as to ensure targets are being met.

Table 4-19: Meeting more frequently

	Alternative	Score
<input checked="" type="checkbox"/>	Client 15	0.2
<input checked="" type="checkbox"/>	Client 8	0.16
<input checked="" type="checkbox"/>	Client 2	0.16
<input checked="" type="checkbox"/>	Client 10	0.16
<input checked="" type="checkbox"/>	Client 1	0.16
<input checked="" type="checkbox"/>	Client 4	0.12
<input checked="" type="checkbox"/>	Client 14	0.12
<input checked="" type="checkbox"/>	Client 13	0.12
<input checked="" type="checkbox"/>	Client 12	0.12
<input checked="" type="checkbox"/>	Client 11	0.12
<input checked="" type="checkbox"/>	Client 3	0.08
<input checked="" type="checkbox"/>	Client 16	0.08
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 9	
<input checked="" type="checkbox"/>	Client 6	
<input checked="" type="checkbox"/>	Client 5	

Key: 0.2% represents 'Strongly Agree'; 0.16% represents 'Agree'; 0.12 represents 'Neutral'; 0.08 represents 'Disagree'; 0.04 represents 'Strongly Disagree'

4.2.3.4 Prompt Delivery

Table 4-20 represents prompt delivery. In 'prompt delivery', 7 responses were received for 'Strongly Agree', 4 responses were received for 'Agree', 2 responses were received for 'Neutral', 1 response was received for 'Strongly Disagree', and 2 clients did not answer this option. It is evident from the responses that 'prompt delivery' is a factor that needs to be considered, hence Jain (2013) enunciated that performance delivery and satisfaction of the client decreases due to vendor delays.

Table 4-20: Prompt delivery

	Alternative	Score
<input checked="" type="checkbox"/>	Client 4	0.2
<input checked="" type="checkbox"/>	Client 2	0.2
<input checked="" type="checkbox"/>	Client 15	0.2
<input checked="" type="checkbox"/>	Client 14	0.2
<input checked="" type="checkbox"/>	Client 11	0.2
<input checked="" type="checkbox"/>	Client 10	0.2
<input checked="" type="checkbox"/>	Client 1	0.2
<input checked="" type="checkbox"/>	Client 9	0.16
<input checked="" type="checkbox"/>	Client 8	0.16
<input checked="" type="checkbox"/>	Client 3	0.16
<input checked="" type="checkbox"/>	Client 12	0.16
<input checked="" type="checkbox"/>	Client 16	0.12
<input checked="" type="checkbox"/>	Client 13	0.12
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 6	
<input checked="" type="checkbox"/>	Client 5	

Key: 0.2% represents ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.04 represents ‘Strongly Disagree’

4.2.3.5 No improvements required, all requirements are met

Table 4-21 represents no improvements required, all requirements are met. In ‘no improvements required, all requirements are met’, 3 responses were received for ‘Strongly Agree’, 1 response was received for ‘Agree’, 5 were received for ‘Neutral’, 3 responses were received for ‘Disagree’ and 4 clients did not answer this option. It is evident from the responses that the respondents are not entirely satisfied with their current outsourcing.

Table 4-21: No improvements required, all requirements are met

	Alternative	Score
<input checked="" type="checkbox"/>	Client 7	0.2
<input checked="" type="checkbox"/>	Client 6	0.2
<input checked="" type="checkbox"/>	Client 5	0.2
<input checked="" type="checkbox"/>	Client 13	0.16
<input checked="" type="checkbox"/>	Client 4	0.12
<input checked="" type="checkbox"/>	Client 2	0.12
<input checked="" type="checkbox"/>	Client 16	0.12
<input checked="" type="checkbox"/>	Client 12	0.12
<input checked="" type="checkbox"/>	Client 10	0.12
<input checked="" type="checkbox"/>	Client 3	0.08
<input checked="" type="checkbox"/>	Client 15	0.08
<input checked="" type="checkbox"/>	Client 11	0.08
<input checked="" type="checkbox"/>	Client 9	
<input checked="" type="checkbox"/>	Client 8	
<input checked="" type="checkbox"/>	Client 14	
<input checked="" type="checkbox"/>	Client 1	

Key: 0.2% represents ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.08 represents ‘Disagree’

The factors that **respondents would like to improve with their vendors**, ‘communication’; ‘prompt delivery’; and ‘trust’ need to be considered and improved in the client-vendor relationship, when compared to the other 2 factors.

4.2.4 The Perceived Current Disadvantages of Outsourcing

This question provides limitations on what the clients feel as disadvantages of outsourcing with their current vendor. There are 5 limitations in this question, namely: 1) ‘we no longer have full control of the business process’; 2) ‘the cost of reversing outsourcing contracts is too high’; 3) ‘it is not cost effective’; and 4) ‘the vendor does not have a good understanding of our organisation’. Each of these limitations was analysed separately, and their results are presented below.

4.2.4.1 We no longer have full control of the business process

Table 4-22 represents we no longer have full control of the business process. For ‘we no longer have full control of the business process’, 2 responses were received for ‘Strongly Agree’, 2 responses were received for ‘Agree’, 5 responses were received for ‘Neutral’, 4 responses were received for ‘Disagree’, 2 responses were received for ‘Strongly Disagree’, and 1 client did not answer this limitation. When it comes to this limitation, the responses vary, so these clients do have some control over their business process, however, Currie (2000), Faisal and Raza (2016) emphasised that the outsourcing organisations do not have full control of the business process when activities are outsourced.

Table 4-22: We no longer have full control of the business process

	Alternative	Score
<input checked="" type="checkbox"/>	Client 10	0.2
<input checked="" type="checkbox"/>	Client 1	0.2
<input checked="" type="checkbox"/>	Client 9	0.16
<input checked="" type="checkbox"/>	Client 11	0.16
<input checked="" type="checkbox"/>	Client 8	0.12
<input checked="" type="checkbox"/>	Client 2	0.12
<input checked="" type="checkbox"/>	Client 15	0.12
<input checked="" type="checkbox"/>	Client 14	0.12
<input checked="" type="checkbox"/>	Client 13	0.12
<input checked="" type="checkbox"/>	Client 4	0.08
<input checked="" type="checkbox"/>	Client 3	0.08
<input checked="" type="checkbox"/>	Client 16	0.08
<input checked="" type="checkbox"/>	Client 12	0.08
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 6	0.04
<input checked="" type="checkbox"/>	Client 5	

Key: 0.2% represent ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.08 represents ‘Disagree’; 0.04 represents ‘Strongly Disagree’

4.2.4.2 The costs of reversing outsourcing contracts are too high

Table 4-23 represents the costs of reversing outsourcing contracts are too high. For ‘the cost of reversing outsourcing contracts are too high’, 2 responses were received for ‘Strongly Agree’, 3 responses were received for ‘Agree’, 3 responses were received for ‘Neutral’, 5

responses were received for ‘Disagree’, 2 responses received for ‘Strongly Disagree’, and 1 client did not answer this option. When it comes to this limitation, the responses vary. Ketler and Willems (1999) have stated that the vendor selection and contract terms are factors that will determine whether the outsourcing is successful, or simply a disaster, hence Currie (2000), Faisal and Raza (2016), and Lacity and Willcocks (1998; 2000) posit that termination of contracts can often prove prohibitively expensive.

Table 4-23: The costs of reversing outsourcing contracts are too high

Alternative	Score
<input checked="" type="checkbox"/> Client 15	0.2
<input checked="" type="checkbox"/> Client 1	0.2
<input checked="" type="checkbox"/> Client 2	0.16
<input checked="" type="checkbox"/> Client 11	0.16
<input checked="" type="checkbox"/> Client 10	0.16
<input checked="" type="checkbox"/> Client 8	0.12
<input checked="" type="checkbox"/> Client 14	0.12
<input checked="" type="checkbox"/> Client 12	0.12
<input checked="" type="checkbox"/> Client 9	0.08
<input checked="" type="checkbox"/> Client 4	0.08
<input checked="" type="checkbox"/> Client 3	0.08
<input checked="" type="checkbox"/> Client 16	0.08
<input checked="" type="checkbox"/> Client 13	0.08
<input checked="" type="checkbox"/> Client 7	0.04
<input checked="" type="checkbox"/> Client 6	0.04
<input checked="" type="checkbox"/> Client 5	

Key: 0.2% represents ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.08 represents ‘Disagree’; 0.04 represents ‘Strongly Disagree’

4.2.4.3 It is not cost effective

Table 4-24 represents it is not cost effective. For ‘it is not cost effective’, 1 response was received for ‘Strongly Agree’, 2 responses were received for ‘Agree’, 6 responses were received for ‘Neutral’, 4 responses were received for ‘Disagree’, 2 responses were received for ‘Strongly Disagree’, and 1 client did not answer this limitation. It is evident from the responses the cost is important. As briefly discussed in section 4.2.1.1, outsourcing assists organisations in saving on cost.

Table 4-24: It is not cost effective

	Alternative	Score
<input checked="" type="checkbox"/>	Client 1	0.2
<input checked="" type="checkbox"/>	Client 2	0.16
<input checked="" type="checkbox"/>	Client 15	0.16
<input checked="" type="checkbox"/>	Client 8	0.12
<input checked="" type="checkbox"/>	Client 4	0.12
<input checked="" type="checkbox"/>	Client 14	0.12
<input checked="" type="checkbox"/>	Client 12	0.12
<input checked="" type="checkbox"/>	Client 11	0.12
<input checked="" type="checkbox"/>	Client 10	0.12
<input checked="" type="checkbox"/>	Client 9	0.08
<input checked="" type="checkbox"/>	Client 3	0.08
<input checked="" type="checkbox"/>	Client 16	0.08
<input checked="" type="checkbox"/>	Client 13	0.08
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 6	0.04
<input checked="" type="checkbox"/>	Client 5	

Key: 0.2% represents ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.08 represents ‘Disagree’; 0.04 represents ‘Strongly Disagree’

4.2.4.4 There is no regular meeting with the vendor

Table 4-25 represents there are no regular meeting with the vendor. For ‘there are no regular meeting with the vendor’, 1 response was received for ‘Strongly Agree’, 2 responses were received for ‘Agree’, 5 responses were received for ‘Neutral’, 4 responses were received for ‘Disagree’, 2 responses were received for ‘Strongly Disagree’, and 1 client did not answer this limitation. As briefly discussed in sections 4.2.2 and 4.2.3.3, the client/s does not wish to meet with the vendor as often, but still prefers meeting frequently to ensure targets are being met.

Table 4-25: There is no regular meeting with the vendor

	Alternative	Score
<input checked="" type="checkbox"/>	Client 1	0.2
<input checked="" type="checkbox"/>	Client 8	0.16
<input checked="" type="checkbox"/>	Client 2	0.16
<input checked="" type="checkbox"/>	Client 4	0.12
<input checked="" type="checkbox"/>	Client 15	0.12
<input checked="" type="checkbox"/>	Client 14	0.12
<input checked="" type="checkbox"/>	Client 11	0.12
<input checked="" type="checkbox"/>	Client 10	0.12
<input checked="" type="checkbox"/>	Client 9	0.08
<input checked="" type="checkbox"/>	Client 3	0.08
<input checked="" type="checkbox"/>	Client 16	0.08
<input checked="" type="checkbox"/>	Client 13	0.08
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 6	0.04
<input checked="" type="checkbox"/>	Client 12	0.04
<input checked="" type="checkbox"/>	Client 5	

Key: 0.2% represents 'Strongly Agree'; 0.16% represents 'Agree'; 0.12 represents 'Neutral'; 0.08 represents 'Disagree'; 0.04 represents 'Strongly Disagree'

4.2.4.5 The vendor does not have a good understanding of our organisation

Table 4-26 represents the vendor does not have a good understanding of our organisation. For 'the vendor does not have a good understanding of our organisation', 2 responses were received for 'Strongly Agree', 2 responses were received for 'Agree', 5 responses were received for 'Neutral', 4 response were received for 'Disagree' and 3 responses were received for 'Strongly Disagree'. The responses vary for this limitation, however, Lee and Kim (1999) buttressed that the vendors sometimes do not have a good understanding of the client organisations.

Table 4-26: The vendor does not have a good understanding of our organisation

	Alternative	Score
<input checked="" type="checkbox"/>	Client 5	0.2
<input checked="" type="checkbox"/>	Client 2	0.2
<input checked="" type="checkbox"/>	Client 3	0.16
<input checked="" type="checkbox"/>	Client 1	0.16
<input checked="" type="checkbox"/>	Client 8	0.12
<input checked="" type="checkbox"/>	Client 4	0.12
<input checked="" type="checkbox"/>	Client 15	0.12
<input checked="" type="checkbox"/>	Client 14	0.12
<input checked="" type="checkbox"/>	Client 11	0.12
<input checked="" type="checkbox"/>	Client 9	0.08
<input checked="" type="checkbox"/>	Client 16	0.08
<input checked="" type="checkbox"/>	Client 13	0.08
<input checked="" type="checkbox"/>	Client 10	0.08
<input checked="" type="checkbox"/>	Client 7	0.04
<input checked="" type="checkbox"/>	Client 6	0.04
<input checked="" type="checkbox"/>	Client 12	0.04

Key: 0.2% represents ‘Strongly Agree’; 0.16% represents ‘Agree’; 0.12 represents ‘Neutral’; 0.08 represents ‘Disagree’; 0.04 represents ‘Strongly Disagree’

In the perceived current disadvantages of outsourcing, ‘we no longer have full control of the business process’, ‘the cost of reversing outsourcing contracts are too high’ and ‘the vendor does not have a good understanding of our organisation’ are the common disadvantages reported by the clients.

4.2.5 Is the Current Method of Outsourcing Workable?

This question analyses whether the client is content with the outsourcing relationship illustrated in Table 4-27. Table 4-27 illustrates whether the current method of outsourcing is workable. ‘Good, but room for improvement’ received the highest rate of response, about 40%. ‘Excellent’ had the second highest rating of 30%. ‘Nothing to be changed’ had the third highest rating of 20%. ‘Needs significant improvement’ had the lowest rating of 10%. More than half indicated that the relationship was ‘good, but that there was room for improvement’. Therefore, the clients can be determined to be satisfied thus far with their relationship with their vendor.

Table 4-27: Current method of outsourcing workable

Criterion	Global weight [%]	Local weight [%]
Excellent	30	30
Good but room for improvement	40	40
Needs significant improvement	10	10
Nothing to be changed	20	20

4.2.6 Definition of Criteria

This question provides the different multiple criteria. There are 11 criteria in this question, namely: 1) ‘cost’; 2) ‘quality’; 3) ‘commitment’; 4) ‘additional resources’; 5) ‘additional expertise’; 6) ‘prior work’; 7) ‘contract terms’; 8) ‘confidentiality’; and 9) ‘location’. The respondents will rate the criteria according to their organisation’s importance. Each criterion is discussed separately.

4.2.6.1 Cost

Table 4-28 represents a cost. In the category of ‘cost’, 10 responses were received for ‘Very Important’, 5 responses were received for ‘Important’ and, 1 response was received for ‘Neutral’. It is evident from the responses that cost is significant in outsourcing, as Khan and Lacity (2012) also concluded cost to be one of the main drivers in their research.

Table 4-28: Cost

Alternative	Score
<input checked="" type="checkbox"/> Client 9	0.091
<input checked="" type="checkbox"/> Client 7	0.091
<input checked="" type="checkbox"/> Client 6	0.091
<input checked="" type="checkbox"/> Client 5	0.091
<input checked="" type="checkbox"/> Client 4	0.091
<input checked="" type="checkbox"/> Client 2	0.091
<input checked="" type="checkbox"/> Client 16	0.091
<input checked="" type="checkbox"/> Client 14	0.091
<input checked="" type="checkbox"/> Client 10	0.091
<input checked="" type="checkbox"/> Client 1	0.091
<input checked="" type="checkbox"/> Client 8	0.073
<input checked="" type="checkbox"/> Client 3	0.073
<input checked="" type="checkbox"/> Client 13	0.073
<input checked="" type="checkbox"/> Client 12	0.073
<input checked="" type="checkbox"/> Client 11	0.073
<input checked="" type="checkbox"/> Client 15	0.055

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’

4.2.6.2 Quality

Table 4-29 represents quality. For the category of ‘quality’, 15 responses were received for ‘Very Important’, 1 response was received for ‘Important’. It is evident from the responses that ‘quality’ is imperative in outsourcing, as Jain (2013) also stressed that poor quality of service or product causes organisations reputational damage, as well as damage to client, employees and vendor relationships.

Table 4-29: Quality

Alternative	Score
<input checked="" type="checkbox"/> Client 9	0.091
<input checked="" type="checkbox"/> Client 8	0.091
<input checked="" type="checkbox"/> Client 7	0.091
<input checked="" type="checkbox"/> Client 6	0.091
<input checked="" type="checkbox"/> Client 5	0.091
<input checked="" type="checkbox"/> Client 4	0.091
<input checked="" type="checkbox"/> Client 3	0.091
<input checked="" type="checkbox"/> Client 2	0.091
<input checked="" type="checkbox"/> Client 16	0.091
<input checked="" type="checkbox"/> Client 14	0.091
<input checked="" type="checkbox"/> Client 13	0.091
<input checked="" type="checkbox"/> Client 12	0.091
<input checked="" type="checkbox"/> Client 11	0.091
<input checked="" type="checkbox"/> Client 10	0.091
<input checked="" type="checkbox"/> Client 1	0.091
<input checked="" type="checkbox"/> Client 15	0.073

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’

4.2.6.3 Commitment

Table 4-30 represents a commitment. When it comes to ‘commitment’, 11 responses were received from ‘Very Important’, and 5 responses were received for ‘Important’. It is evident that ‘commitment’ is significant in outsourcing. Goles and Chinn (2005) highlighted commitment to be one of the criteria used in their research on outsourcing relationships.

Table 4-30: Commitment

	Alternative	Score
<input checked="" type="checkbox"/>	Client 8	0.091
<input checked="" type="checkbox"/>	Client 7	0.091
<input checked="" type="checkbox"/>	Client 6	0.091
<input checked="" type="checkbox"/>	Client 5	0.091
<input checked="" type="checkbox"/>	Client 16	0.091
<input checked="" type="checkbox"/>	Client 14	0.091
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 12	0.091
<input checked="" type="checkbox"/>	Client 11	0.091
<input checked="" type="checkbox"/>	Client 10	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 9	0.073
<input checked="" type="checkbox"/>	Client 4	0.073
<input checked="" type="checkbox"/>	Client 3	0.073
<input checked="" type="checkbox"/>	Client 2	0.073
<input checked="" type="checkbox"/>	Client 15	0.073

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’

4.2.6.4 Additional Resources

Table 4-31 represents additional resources. In ‘additional resources’, 4 responses were received for ‘Very Important’, 8 responses were received for ‘Important’, 3 responses were received for ‘Neutral’ and 1 response was received for ‘Less Important’. It is evident that ‘additional resources’ are essential in outsourcing, as briefly discussed in section 4.2.1.3.

Table 4-31: Additional Resources

	Alternative	Score
<input checked="" type="checkbox"/>	Client 6	0.091
<input checked="" type="checkbox"/>	Client 5	0.091
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 9	0.073
<input checked="" type="checkbox"/>	Client 8	0.073
<input checked="" type="checkbox"/>	Client 2	0.073
<input checked="" type="checkbox"/>	Client 16	0.073
<input checked="" type="checkbox"/>	Client 14	0.073
<input checked="" type="checkbox"/>	Client 12	0.073
<input checked="" type="checkbox"/>	Client 11	0.073
<input checked="" type="checkbox"/>	Client 10	0.073
<input checked="" type="checkbox"/>	Client 7	0.055
<input checked="" type="checkbox"/>	Client 4	0.055
<input checked="" type="checkbox"/>	Client 15	0.055
<input checked="" type="checkbox"/>	Client 3	0.036

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’; 0.036% represents ‘Less Important’

4.2.6.5 Additional Expertise

Table 4-32 represents additional expertise. In ‘additional expertise’, 5 responses were received for ‘Very Important’, 8 responses were received for ‘Important’, 2 responses were received for ‘Neutral’ and 1 response was received for ‘Less Important’. It is evident from the responses that additional expertise is also essential in outsourcing as briefly discussed in section 4.2.1.2.

Table 4-32: Additional Expertise

	Alternative	Score
<input checked="" type="checkbox"/>	Client 6	0.091
<input checked="" type="checkbox"/>	Client 5	0.091
<input checked="" type="checkbox"/>	Client 15	0.091
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 9	0.073
<input checked="" type="checkbox"/>	Client 8	0.073
<input checked="" type="checkbox"/>	Client 2	0.073
<input checked="" type="checkbox"/>	Client 16	0.073
<input checked="" type="checkbox"/>	Client 14	0.073
<input checked="" type="checkbox"/>	Client 12	0.073
<input checked="" type="checkbox"/>	Client 11	0.073
<input checked="" type="checkbox"/>	Client 10	0.073
<input checked="" type="checkbox"/>	Client 7	0.055
<input checked="" type="checkbox"/>	Client 4	0.055
<input checked="" type="checkbox"/>	Client 3	0.036

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’; 0.036% represents ‘Less Important’

4.2.6.6 Prior Work

Table 4-33 represents prior work. In the ‘prior work’, 5 responses were received for ‘Very Important’, 8 responses were received for ‘Important’, 2 responses were received for ‘Neutral’ and, 1 response was received for ‘Less Important’. It is evident that ‘prior work’ is an important criterion for outsourcing, as Faisal and Raza (2016) indicated that knowledge of industry is also a criterion.

Table 4-33: Prior Work

	Alternative	Score
<input checked="" type="checkbox"/>	Client 6	0.091
<input checked="" type="checkbox"/>	Client 5	0.091
<input checked="" type="checkbox"/>	Client 3	0.091
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 9	0.073
<input checked="" type="checkbox"/>	Client 8	0.073
<input checked="" type="checkbox"/>	Client 4	0.073
<input checked="" type="checkbox"/>	Client 16	0.073
<input checked="" type="checkbox"/>	Client 15	0.073
<input checked="" type="checkbox"/>	Client 12	0.073
<input checked="" type="checkbox"/>	Client 11	0.073
<input checked="" type="checkbox"/>	Client 10	0.073
<input checked="" type="checkbox"/>	Client 2	0.055
<input checked="" type="checkbox"/>	Client 14	0.055
<input checked="" type="checkbox"/>	Client 7	0.036

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’; 0.036% represents ‘Less Important’

4.2.6.7 Contract Terms

Table 4-34 represents the category of contract terms. In ‘contract terms’, 6 responses were received for ‘Very Important’, 5 responses were received for ‘Important’, 4 responses were received for ‘Neutral’ and, 1 response was received for ‘Less Important’. It is evident from the responses that ‘contract terms’ are also important. Goo *et al.* (2000) posit that contracts, service level agreements, compensation plans, measurement systems, etc., can only be aligned more closely to yield successful outsourcing results when objectives and drivers are more clearly understood and articulated, therefore the contract must be understood by client-vendor at the start of the relationship.

Table 4-34: Contract Terms

	Alternative	Score
<input checked="" type="checkbox"/>	Client 8	0.091
<input checked="" type="checkbox"/>	Client 6	0.091
<input checked="" type="checkbox"/>	Client 4	0.091
<input checked="" type="checkbox"/>	Client 16	0.091
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 9	0.073
<input checked="" type="checkbox"/>	Client 3	0.073
<input checked="" type="checkbox"/>	Client 2	0.073
<input checked="" type="checkbox"/>	Client 14	0.073
<input checked="" type="checkbox"/>	Client 10	0.073
<input checked="" type="checkbox"/>	Client 7	0.055
<input checked="" type="checkbox"/>	Client 5	0.055
<input checked="" type="checkbox"/>	Client 12	0.055
<input checked="" type="checkbox"/>	Client 11	0.055
<input checked="" type="checkbox"/>	Client 15	0.036

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’; 0.036% represents ‘Less Important’

4.2.6.8 Confidentiality

Table 4-35 represents the category of confidentiality. In ‘confidentiality’, 13 responses were received for ‘Very Important’, 3 responses were received for ‘Important’. It is evident by the responses that ‘confidentiality’ is significant in outsourcing, where Gritzalis *et al.* (2007) likewise believed that it is risky to outsource sensitive personal information to a vendor for security reasons.

Table 4-35: Confidentiality

	Alternative	Score
<input checked="" type="checkbox"/>	Client 9	0.091
<input checked="" type="checkbox"/>	Client 8	0.091
<input checked="" type="checkbox"/>	Client 7	0.091
<input checked="" type="checkbox"/>	Client 6	0.091
<input checked="" type="checkbox"/>	Client 5	0.091
<input checked="" type="checkbox"/>	Client 4	0.091
<input checked="" type="checkbox"/>	Client 2	0.091
<input checked="" type="checkbox"/>	Client 16	0.091
<input checked="" type="checkbox"/>	Client 15	0.091
<input checked="" type="checkbox"/>	Client 14	0.091
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 11	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 3	0.073
<input checked="" type="checkbox"/>	Client 12	0.073
<input checked="" type="checkbox"/>	Client 10	0.073

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’

4.2.6.9 Location

Table 4-36 represents the category of location. In ‘location’, 3 responses were received for ‘Very Important’, 3 responses were received for ‘Important’, 6 responses were received for ‘Neutral’, 3 responses were received for ‘Less Important’ and, 1 response was received for ‘Not important’. It is evident from the responses that some respondents deem ‘location’ as less significant. Aruldoss *et al.* (2013) used the location of the vendor as one of the criteria in their study for vendor selection, however, King (2008) stated that outsourcing IT jobs to vendors outside multi-cultural areas is a gamble in terms of choice.

Table 4-36: Location

	Alternative	Score
<input checked="" type="checkbox"/>	Client 8	0.091
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 16	0.073
<input checked="" type="checkbox"/>	Client 11	0.073
<input checked="" type="checkbox"/>	Client 10	0.073
<input checked="" type="checkbox"/>	Client 6	0.055
<input checked="" type="checkbox"/>	Client 5	0.055
<input checked="" type="checkbox"/>	Client 2	0.055
<input checked="" type="checkbox"/>	Client 15	0.055
<input checked="" type="checkbox"/>	Client 14	0.055
<input checked="" type="checkbox"/>	Client 12	0.055
<input checked="" type="checkbox"/>	Client 9	0.036
<input checked="" type="checkbox"/>	Client 4	0.036
<input checked="" type="checkbox"/>	Client 3	0.036
<input checked="" type="checkbox"/>	Client 7	0.018

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’; 0.036% represents ‘Less Important’; 0.018 represents ‘Not Important’

4.2.6.10 On Supplier Database

Table 4-37 represents the category on supplier database. In ‘on supplier database’, 2 responses were received for ‘Very Important’, 2 responses were received for ‘Important’, 6 responses were received for ‘Neutral’, 4 responses were received for ‘Less Important’ and, 2 responses were received for ‘Not Important’. It is evident by the number of responses that ‘on supplier database’ is not a popular criterion from these respondents, however, Faisal and Raza (2016) opine that vendors should be evaluated based on criteria which are selected from an outlined list. The reputation of the vendor was one of the criteria used in their research.

Table 4-37: On Supplier Database

	Alternative	Score
<input checked="" type="checkbox"/>	Client 13	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 7	0.073
<input checked="" type="checkbox"/>	Client 10	0.073
<input checked="" type="checkbox"/>	Client 6	0.055
<input checked="" type="checkbox"/>	Client 5	0.055
<input checked="" type="checkbox"/>	Client 4	0.055
<input checked="" type="checkbox"/>	Client 16	0.055
<input checked="" type="checkbox"/>	Client 12	0.055
<input checked="" type="checkbox"/>	Client 11	0.055
<input checked="" type="checkbox"/>	Client 3	0.036
<input checked="" type="checkbox"/>	Client 2	0.036
<input checked="" type="checkbox"/>	Client 15	0.036
<input checked="" type="checkbox"/>	Client 14	0.036
<input checked="" type="checkbox"/>	Client 9	0.018
<input checked="" type="checkbox"/>	Client 8	0.018

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’; 0.036% represents ‘Less Important’; 0.018 represents ‘Not Important’

4.2.6.11 Black Economic Empowerment

Table 4-38 represents the category of BEE. In ‘BEE’, 6 responses were received for ‘Very Important’, 5 responses were received for ‘Important’, 1 response was received for ‘Neutral’, 2 responses were received for ‘Less Important’ and, 2 responses were received for ‘Not Important’. It is evident from these responses that BEE is a popular criterion from these respondents, therefore Akinsomi *et al.* (2015) illustrated that BEE compliant organisations have higher returns and are deemed as less risky than are non-BEE compliant organisations.

Table 4-38: Black Economic Empowerment

	Alternative	Score
<input checked="" type="checkbox"/>	Client 9	0.091
<input checked="" type="checkbox"/>	Client 6	0.091
<input checked="" type="checkbox"/>	Client 5	0.091
<input checked="" type="checkbox"/>	Client 4	0.091
<input checked="" type="checkbox"/>	Client 10	0.091
<input checked="" type="checkbox"/>	Client 1	0.091
<input checked="" type="checkbox"/>	Client 8	0.073
<input checked="" type="checkbox"/>	Client 3	0.073
<input checked="" type="checkbox"/>	Client 2	0.073
<input checked="" type="checkbox"/>	Client 16	0.073
<input checked="" type="checkbox"/>	Client 15	0.073
<input checked="" type="checkbox"/>	Client 13	0.055
<input checked="" type="checkbox"/>	Client 12	0.036
<input checked="" type="checkbox"/>	Client 11	0.036
<input checked="" type="checkbox"/>	Client 7	0.018
<input checked="" type="checkbox"/>	Client 14	0.018

Key: represents 0.091% ‘Very Important’; 0.073% represents ‘Important’; 0.055% represents ‘Neutral’; 0.036% represents ‘Less Important’; 0.018 represents ‘Not Important’

In the **Definition of the criteria**, ‘quality’ (15 responses); ‘confidentiality’ (13 responses); ‘commitment’ (11 responses); and ‘cost’ (10 responses) were all rated as more popular than other criteria.

4.3 Results of the Criteria Importance

The client questionnaire was designed to extract data about the multiple criteria, which was the core of this research. Question five in the client questionnaire dealt with multiple criteria, which the clients rated in accordance to the level of importance within and relevant to their organisations. The researcher analysed the data entered from the clients for the multiple criteria. The researcher then took only the number of responses for ‘Very Important’. These were converted into a percentage as follows:

Table 4-39: Responses for ‘Very Important’

CRITERIA	No. of Responses ‘Very Important’	%
Cost	10	62.5
Quality	15	93.8
Commitment	11	68.8
Additional Resources	4	25
Additional Expertise	5	31.3
Prior Work	5	31.3
Contract Terms	6	37.5
Confidentiality	13	81.3
Location	3	18.8
On Supplier Database	2	12.5
BEE	6	37.5

These percentage values were entered into MakeItRational™/®/© and were converted in average criteria weighting. These weightings are displayed in Table 4-40.

4.3.1 Criterion Weights


The weight of each criterion is illustrated in Table 4-40.

Table 4-40: Criterion Weights

CRITERION	Global weight [%]	Local weight [%]
Additional Expertise	6.3	6.3
Additional Resources	5	5
BEE	7.5	7.5
Commitment	13.8	13.8
Confidentiality	16.3	16.3
Contract Terms	7.5	7.5
Cost	12.5	12.5
Location	3.8	3.8
On Supplier Database	2.5	2.5
Prior Work	6.3	6.3
Quality	18.8	18.8

These values from Table 4-40 were entered into the AHP software. The software took all the values into account and ranked the multiple criteria from highest to lowest. The final ranking of the multiple criteria for ‘Very Important’ is illustrated in Table 4-41.

Table 4-41: Client Criteria Rating



Most Important	RATING OF CRITERIA
	Quality
	Confidentiality
	Commitment
	Cost
	Contract terms
	BEE
	Prior work
	Additional Expertise
	Additional Resources
	Location
	On Supplier Database
	Least Important

4.4 Results of Ranking IT Outsourcing Vendors

The vendor questionnaire was designed to acquire the valued input of the vendor to determine the criteria rating according to importance from their point of view. The vendors rated the criteria from ‘Most Important’ to ‘Least ‘Important’. It was imperative to collect data from the vendor as well. This will assist in getting a better understanding of this outsourcing process.

The data collected from the 3 vendors are illustrated in Table 4-42.

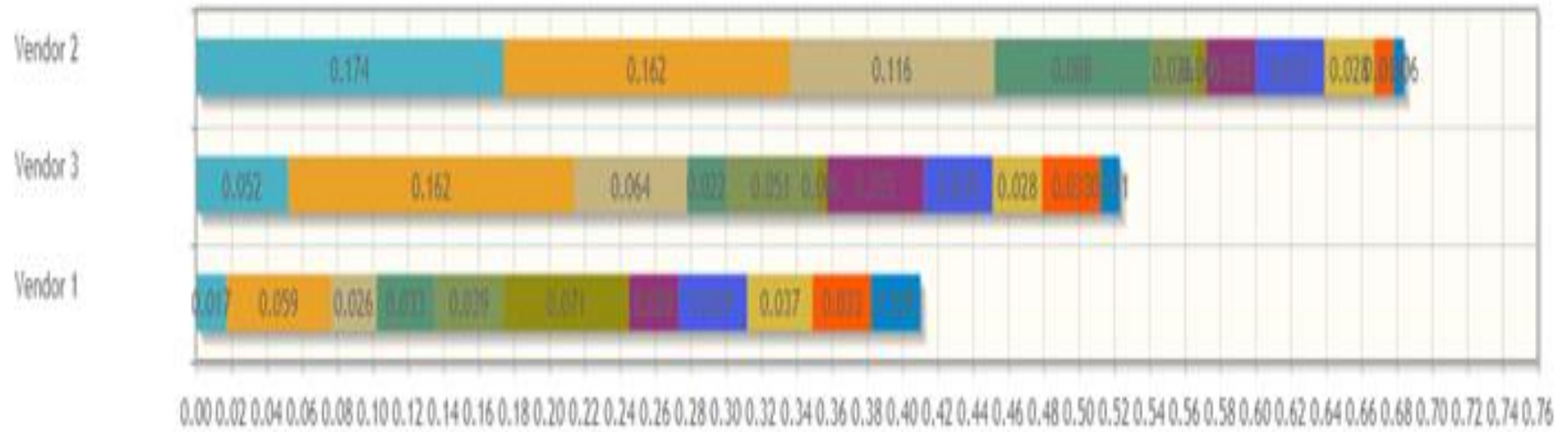
Table 4-42: Vendors Criteria Rating

	VENDOR 1 Rating of Criteria	VENDOR 2 Rating of Criteria	VENDOR 3 Rating of Criteria
Most Important	BEE	Confidentiality	Confidentiality
	On supplier database	Quality	Prior work
	Location	Commitment	Location
	Additional resources	Cost	Contract terms
	Additional expertise	Additional expertise	Additional expertise
	Contract terms	Additional resources	Additional resources
	Prior work	Prior work	Commitment
	Confidentiality	Contract terms	On supplier database
	Cost	Location	Quality
	Least Important	Commitment	On supplier database
Quality		BEE	BEE

The data from the global client ranking in Table 4-41 and the data from the vendor criteria rating in Table 4-42 were entered into the MakeItRational™/®/© for the ranking of vendors. The final results of the vendor ranking are illustrated in Table 4-43.

Table 4-43: Vendor Rating

	Alternative	Score
<input checked="" type="checkbox"/>	Vendor 2	0.682
<input checked="" type="checkbox"/>	Vendor 3	0.523
<input checked="" type="checkbox"/>	Vendor 1	0.408

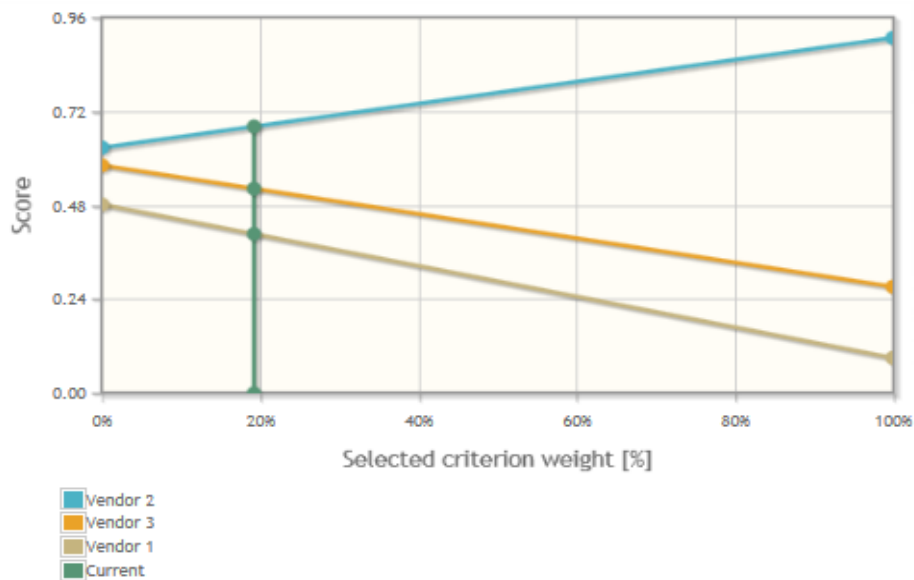


Graph 4-1: Vendor Rating

Graph 4-1 illustrates the global client ranking data and vendors criteria rating data that were taken into account. The results are shown in the above graph were the vendors have been rated according to the criteria importance. Vendor 2 has been chosen as the most suitable vendor for this research.

Sensitivity Analysis

According to Yadav and Sharma (2016), the objective of the SA is to graphically view the changes in alternatives in terms of importance of criteria ranking. In Graph 4-2 the criterion ‘quality’, Vendor 2 is ranked on top, followed by Vendor 3 and Vendor 1. Any change of the priority of ‘quality’ will result in a change in vendor ranking.



Graph 4-2: Sensitivity Analysis for Quality

4.5 Conclusion

This chapter looked at outsourcing holistically from a client and vendor perspective, hence has been separated in 3 parts. First the client questionnaires were analysed. Then the multiple criteria were rated according to their importance, and finally, the most appropriate vendor was chosen. There were two questionnaires that were distributed namely a client questionnaire and a vendor questionnaire. There were 16 clients and 3 vendors that filled out the questionnaire.

Part 1 analysed the client questionnaire. Firstly, an analysis was conducted on the respondents' job titles, nature of the organisations and outsourced functions. There were clients from different job sectors that completed this questionnaire, and a variety of organisations that were listed, but no responses were received from 'local government authority', 'state owned enterprises', 'storage companies', 'shipping companies' and 'transportation'. The most popular outsourced functions were 'off-site backup', 'company website design/hosting', 'IT support/training' and 'computer and hardware purchasing'. An analysis was conducted on the tender process, where 50% reported using the tender process, the more popular methodologies for which were 'group decisions', 'evaluation models' and 'evaluation by elimination and evaluation models'.

The benefits of outsourcing were 'cost effectiveness', 'where management can concentrate on their core activities' and 'quality of work increases as experts are handling the tasks'. These were rated as most popular, because 'Strongly Agree' and 'Agree' were the two common options chosen. The clients preferred to meet with the vendor 'monthly', 'quarterly' and 'ad-hoc' so as to ensure targets were met. The clients preferred 'communication', 'prompt delivery' and 'trust' to be improved in their relationships with their vendors.

The common disadvantages from the clients were that they 'no longer had full control of the business process'; 'the cost of reversing outsourcing contracts was too high' and 'the vendor did not have a good understanding of their organisation'. More than half indicated that the relationships were 'good, but that there was room for improvement'. From the 11 criteria that were listed, the respondents rated the criteria according to their organisation's importance, where 'quality', 'confidentiality', 'commitment' and 'cost' were rated as being more popular.

Part 2 of this chapter involved rating of the multiple criteria. The multiple criteria were given to client to analyse and finding were recorded. In this section, the researcher looked at the multi criteria responses for 'Very Important' and worked out its percentages. These values were entered into MakeItRational TM/_®/_© and the software weighted these values. The software then ranked the multiple criteria from the 'Most Important' to 'Least Important'.

Part 3 analysed the data entered from the vendor questionnaire. The multiple criteria were ranked from 'Most Important' to 'Least Important' for each of the vendors. It was now required to find a model to compare each of the vendor ranking to that of the global client ranking. The vendors' values were entered into MakeItRational TM/_®/_©, including the global client ranking. The software analysed all the data entered and provided a ranked list of the 3

vendors. The vendor that matches the clients global ranking closely should be chosen by the client. This is the functionality of MakeItRational TM/_®/_©, where the software took the clients global ranking and compared it to each vendor's ranking, thus providing a ranked list of the vendors.

In this chapter, input data from the client was analysed and the criteria was ranked. Criteria supplied by vendors was also analysed and ranked. Finally, all the multiple criteria data from the client and vendor was input into MakeItRational TM/_®/_©, which finally presented the final ranking of the most suitable vendor. This model can be applied to any organisation that might assist in ranking of the vendors.

CHAPTER 5

CONCLUSION

The researcher analysed the need for organisations that seemingly require assistance in selection of the most appropriate vendor in IT outsourcing. This was based on critical analyses which were performed on criteria for selection, the most befitting and the selected AHP model and the MakeItRational™/®/© software. The aim of this research was to develop a decision making process for effectively selecting ITO vendors. This has been detailed in the objectives below.

Objective 1 of this study is to establish the decision criteria that influence the selection of ITO vendors. In terms of the first objective, an extensive literature survey was carried. It became obvious that there were a number of criteria involved in the evaluation of vendors. Evaluation of multiple criteria is complex, and as such, required an MCDM approach.

Objective 2 of this study is to use the AHP, a mathematical multiple criteria optimisation method to determine the importance of a criterion in vendor selection decision. In order to achieve this effectively, it is necessary to examine the various approaches already reported on by previous authors. Criteria are important issues in vendor selection, since it measures the performance of the vendor. Organisations needs differ from one another, where models need to be developed for different situations. Since vendor selection is also dependent on multiple criteria, MCDM approach was necessary. The literature study also revealed that there a number of MCDM methods/models/approaches available for the evaluation of multiple criteria. After a comparative analysis of the methods and models, the AHP was chosen as the most suitable model for vendor selection. Organisations will accumulate more savings if the vendor selection is conducted more efficiently. The researcher chose the AHP approach because AHP can be used to effectively analyse ITO decisions. The decision making process can be consistently repeated and documented while sensitivity analysis can be performed on the best option before any action is taken. The AHP assisted in the multi criteria problem and the decision making problem for the selection of a vendor. Questionnaires were used to obtain data from the client and the vendor. Bearing this in mind there may have been some inconsistencies when these

questionnaires were completed. The AHP was an excellent tool, as it factored in inconsistencies and human judgement. There was a comparative analysis of the different multi criteria decision analytical software. MakeItRational™/®/© was the chosen software for this research. This software was most flexible as compared to the other multi criteria decision analytical software. The results were presented in the form of tables and graphs. The client questionnaire was analysed. The multiple criteria from the client questionnaire were ranked from highest to lowest. The vendor questionnaire was analysed. The ranked multiple criteria and data from the vendor questionnaire were fed into the software and the final ranking of the three vendors were conducted.

Objective 3 of this study is to develop and validate a decision making process for guiding the decision of ITO vendor decision. This decision making process should serve as a heuristic for determining a set of criteria, to evaluate and rank ITO vendors soliciting for ITO services in an organisation. An extensive decision making process was constructed which entailed criteria determination and validation, determination of MCDM method, determination of software and finally comparing the criteria which was ranked.

5.1 Limitations during the study

- 1) The researcher found there to be limitations with the software. The SPSS was initially used to analyse the data but could not assist with the ranking. The researcher looked at other AHP tools. The AHP software MakeItRational™/®/© took a while to acquire. The researcher then used MakeItRational™/®/© for all questions including the questions that was already analysed by SPSS. This process was time consuming.
- 2) The researcher was acquainted with some of the clients but not with any of their vendors. It was difficult in acquiring the vendor questionnaire timeously.
- 3) There were a variety of organisations that were listed but no responses were received from ‘local government authority’; ‘state owned enterprises’; ‘storage companies’; ‘shipping companies and transportation’.

5.2 Suggestions for future research

- 1) There were 11 criteria that were analysed for this research. More criteria can be included for further research. The questionnaire should be designed to broaden feedback from clients.
- 2) More extensive research could be done in terms of deciding on the MCDM approach to be used in vendor selection.
- 3) More extensive research (more MCDM software) could be evaluated to determine which is the best available.
- 4) In this study there were only three vendors used. For future research, feedback from more vendors could be analysed.
- 5) 'Most Important' was used to analyse the multiple criteria final rating. Future research can include 'Important' and a combination of 'Most Important' and 'Important'.

5.3 Concluding remarks

Outsourcing is a tool that is useful to assist organisations to compete more effectively if planned and implemented correctly. For successful outsourcing, good management of relationships and contracts must be maintained. The literature has shown that there hasn't been a sufficient decision making processes available from research carried out in South Africa. This research is beneficial, as it will assist organisations in making informed decisions in the vendor selection process.

The main objective of the vendor selection process is to lower the risk and increase the savings for the client. The literature revealed that in the selection process, however, is a complex problem because one is dealing with multiple criteria. Apart from choosing a suitable vendor, it is also significant to choose the correct approach. This research provided evidence that MCDM method is necessary for the selection of an ITO vendor. This method

helped structure the selection process in a clear and systematic way in the corporate environments used in this study.

AHP was a suitable model used in this research. MakeItRational™/®/© was used in the analysis and ranking of the multiple criteria for the client and the vendor. The final process in MakeItRational™/®/© was presenting the final ranking of the most suitable vendor. MakeItRational™/®/© has few steps therefore it was easy to follow. The decision making process produced by this research will assist client organisations make informed decisions when selecting an ITO vendor.

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Annexure A: Client Questionnaire

Outsourcing Questionnaire

SECTION A:

1. Please state your current job title. _____

2. What is the nature of your organisation?

- Local Government Authority
- Higher Education
- State Owned Enterprise
- Health
- Storage
- Shipping
- Inspection and testing
- Property
- Transportation
- Other (Please specify) _____

3. What function/s does your organisation outsource?

- Payroll services
- Off-site backup
- Company web site design/hosting
- IT support/training
- Recruitment
- Credit control
- Computer and hardware purchasing
- Other (Please Specify) _____

SECTION B:

4. Does your organisation use the tender process to select an appropriate IT outsourcing vendor? If answer is No, please continue to question 5.

- Yes
- No

4.1 What method is used during the tender process to select the IT outsourcing vendor that is best suited for your organisation? (Please tick all that apply)

- Decision Support System
- Group Decisions
- Evaluation by elimination
- Evaluation models
- Evaluation by elimination and evaluation models
- Other (Please specify) _____

5. How did you rate the criteria when selecting your current IT outsourcing vendor?
Please complete the table below by marking a 'X' in the appropriate column.

CRITERIA	Very Important	Important	Neutral	Less Important	Not important
Cost					
Quality					
Commitment					
Additional resources					
Additional expertise					
Prior work					
Contract terms					
Confidentiality					
Location					
On supplier database					
BEE					

6. What are the main reasons for outsourcing? Please complete the table below.

BENEFITS	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Cost effectiveness					
Number of in-house expertise					
Do not have necessary resources					
Management can concentrate on their core activities					
Quality of work increases as experts are handling the tasks					
Work is carried out more quickly and more effectively					
Do not have to employ additional staff					

SECTION C:

7. How often **do you and your management** team meet with the IT outsourcing vendor?

- Monthly
- Quarterly
- Half yearly
- Yearly
- Other (Please Specify) _____

8. What would you like **to improve** in your relationship with your IT outsourcing vendor? Please complete the table below.

FACTORS	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Communication					
Trust					
Meeting more frequently					
Prompt delivery					
No improvements required, all requirements are met					

9. What are the current disadvantages of outsourcing? Please complete the table below.

LIMITATIONS	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
We no longer have full control of the business process					
The cost of reversing outsourcing contracts are too high					
It is not cost effective					
There are no regular meeting with the vendor					
The vendor does not have a good understanding of our organisation					

10. Is the current method of outsourcing workable?

- Excellent
- Nothing to be changed
- Good but room for improvement
- Needs significant improvement
- I don't know

Thank you for your time and cooperation.

Annexure B: Vendor Questionnaire



Dear respondent,

I am conducting research on vendor selection in IT outsourcing. The purpose of my study is to ascertain the most important criteria an organisation will look for to suit their needs when selecting an IT outsourcing vendor.

This research requires your valued input as a vendor to determine the criteria your organisation would use to service your client. As a result please can you assist in rating the criteria below from most important to least important?

Below table indicates the rating to be used.

CATEGORY	RATING
Most important	1
	2
	3
	4
	5
	6
	7
	8
	9
	10
Least important	11

Please circle the appropriate rating value with the corresponding criteria.

Note: Rating values can only be used once e.g. if 1 is circled for quality, then the value cannot be used again for other criteria.

CRITERIA	RATING (IMPORTANCE)										
	Most Important					Least Importance					
Cost	1	2	3	4	5	6	7	8	9	10	11
Quality	1	2	3	4	5	6	7	8	9	10	11
Commitment	1	2	3	4	5	6	7	8	9	10	11
Additional resources	1	2	3	4	5	6	7	8	9	10	11
Additional expertise	1	2	3	4	5	6	7	8	9	10	11
Prior work	1	2	3	4	5	6	7	8	9	10	11
Contract terms	1	2	3	4	5	6	7	8	9	10	11
Confidentiality	1	2	3	4	5	6	7	8	9	10	11
Location	1	2	3	4	5	6	7	8	9	10	11
On supplier database	1	2	3	4	5	6	7	8	9	10	11
BEE	1	2	3	4	5	6	7	8	9	10	11

Annexure C: Covering Letter



Dear Participant

I am studying towards a Master's Degree in Information Technology at the Durban University of Technology. The title of my research is: Investigating Vendor Selection Criteria in Information Technology Outsourcing using Multiple Criteria Decision Making.

Please complete the questionnaire to enable me in gathering data for my research. The information you provide will be strictly confidential. Only my research supervisors and I will have access to the completed questionnaires. Please be assured that you will remain completely anonymous throughout the research process and in any reporting or write-ups related to my research.

Please read and sign the attached consent form. Please return the consent form and completed questionnaire to Roshelle Bugwandin at the address below.

Thank you very much.

Roshelle Bugwandin

Tel : 031 3735639

Cell : 083 7998976

E-mail : roshelleb@dut.ac.za

Annexure D: Ethical Clearance



LETTER OF INFORMATION

Title of the Research Study: Investigating Vendor Selection Criteria in Information Technology Outsourcing using Multiple Criteria Decision Making.

Principal Investigator/s/researcher: R Bugwandin

Co-Investigator/s/supervisor/s: Prof O.O Olugbara and Prof T.N Andrew

Brief Introduction and Purpose of the Study: The purpose of this study is to assist organisations in making informed decisions when choosing the most appropriate I.T. Outsourcing vendor that best suits their needs.

Outline of the Procedures: Each participant is required to complete the consent form and the questionnaire.

Risks or Discomforts to the Participant: No risks

Benefits: Publication

Reason/s why the Participant May Be Withdrawn from the Study: No adverse consequences

Remuneration: None

Costs of the Study: No cost

Confidentiality: Information provided will be strictly confidential.

Research-related Injury: No research related injury.

Persons to Contact in the Event of Any Problems or Queries:

Please feel free to contact the researcher, Roshelle Bugwandin or Supervisor Prof O.O Olugbara (031 3735591) or the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 or dvctip@dut.ac.za.

General: Participation is voluntary and the approximate number of participants is 25.

Annexure E: Informed Consent Form



CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, R Bugwandin, about the nature, conduct, benefits and risks of this study.
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research, which may relate to my participation will be made available to me.

_____	_____	_____	_____
Full Name of Participant Thumbprint	Date	Time	Signature / Right

I, Roshelle Bugwandin herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

<u>R Bugwandin</u>	_____	_____
Full Name of Researcher	Date	Signature