THE IMPACT OF E-PROCUREMENT ON NAMAKWA SANDS

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Abstract

In this dissertation the impact of e-procurement on Namakwa Sands was studied. Clear objectives were set in this regard. Firstly the impact on the respective users was to be established. Secondly, the preparedness of the company as well as all users was discussed. The last objective was to render some recommendation as to the implementation of e-procurement.

A thorough empirical study was conducted to study and analyse the current status of user groups and to establish the expected impact of e-procurement on Namakwa Sands. In this regard suppliers, end users in operations and the Materials Management department were addressed.

A literature study provided support for the empirical study and also identified advantages, areas of concern and added some valuable initiatives as to the implementation of e-procurement solutions.

Recommendations were made to support the objectives of this study. Further recommendations were made that may assist in future studies within this field.

The importance of this project cannot be overstressed. Namakwa Sands, as a division of the greater Anglo American worldwide, has to be at the forefront of implementing e-procurement solutions in South Africa and globally. Any e-procurement initiative requires extensive capital investment and change management within the company to realise the benefits thereof. To be well prepared can only assist the company in obtaining its objectives:

- Improve efficiency
- Reduce costs
- Increase profit margins for sustainable development.
Opsomming

In hierdie skripsie word die impak van e-aankope op Namakwa Sands bestudeer. Duidelike doelstellings is in hierdie opsig gestel. Eerstens moes die impak op die respektiewe eindgebruikers bepaal word. Tweedens is die voorbereidheid van die maatskappy asook die eindgebruikers bespreek. Die laaste doelstelling was om voorstelle te maak om die implementering van e-aankope te faciliteer.

'n Deeglike empiriese studie en analise is gedoen om die status van die verskillende eindgebruikers groepe te bepaal en daardeur ook die verwagte impak van e-aankope op Namakwa Sands. In hierdie verband is verskaffers, eindgebruikers in die maatskappy asook die Materiaalbestuur departement geadresseer.

'n Literatuurstudie het ondersteuning gebied aan die empiriese studie. Dit het verder ook voordele, probleem areas en waardevolle inisiatiewe geïdentifiseer in die implementering van e-aankope in 'n maatskappy.

Laastens is voorstelle gemaak wat die doelstellings van die studie ondersteun het. Verdere voorstelle wat moontlik kan bydra tot toekomstige studies in hierdie area is aangeheg.

Die belangrikheid van hierdie projek kan nie oorbeklemtoon word nie. Namakwa Sands, as 'n afdeling van die groter Anglo American wêreldwyd, moet aan die voorpunt staan van die implementering van e-aankope in Suid-Afrika asook globaal. Enige e-aankope inisiatief in 'n maatskappy verg intensiewe kapitaal investering en veranderingsbestuursinisiatiewe om die voordele daarvan te geniet. Om voorbereid te wees kan die maatskappy help om sy doelwitte te bereik:

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Special Circumstances

The sensitivity of information contained herein is evident. Confidentiality thereof is of utmost importance to all role players.

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Chapter 1: Introduction

General

Since the inception of business, the common goal was to obtain a profit. In today’s competitive environment, maximizing a sustainable profit has become the distinction between successful businesses and those collapsing. Over the world companies are seeking new and better ways to develop their businesses and maximising profit.

It is therefore imperative to explore all avenues to achieve this objective. In most companies the main focus for increasing profit margins has fallen within the so-called traditional area.

Figure 1: Under-Exploited Profit Margins

The external spend on goods and services, which often represents between 50% and 60% of a mining company’s total revenues has not been an area of focus.

As detailed in Figure 1, companies usually attempt to increase turnover by directing their attention to the reduction in costs in areas such as overheads, direct labour and indirect labour. The concept of increased turnover due to a focus on purchased goods and services has received minimal attention.

The traditional area can be seen as to concentrate on three main aspects:

- Increased productivity,
- Decreased cost,
- Increased volume.

Increased productivity utilises concepts such as process re-engineering, total quality management and continuous development.

Decrease of costs focuses on the lowering of overheads, direct and/or indirect labour, downsizing and automation with the objective of decreasing the labour cost component and increasing production.

Increase of volume is preferred where the company has high fixed cost and low variable cost. In this case, the higher product volume allows cheaper production. This has a positive impact on profit margin, due to the lowering of overall cost of the product and a stable selling price. All of the above traditional initiatives are commonly found within modern business’s drive to sustainable development.

Anglo American has continuously explored all of the abovementioned approaches, but discovered, by observing detailed cost reports, that these drives only contributed 40 to 50% of their mining company’s turnover (Owen, 2001:5). This effectively means that 50 to 60% of the company’s turnover was unexplored. An in depth investigation revealed that the remainder of the turnover fell under the purchase of goods and services by Anglo American’s various Procurement
divisions, which consisted collectively of a total annual procurement expenditure of 6.3 billion US Dollars.

Anglo American has various divisions, all with mainly decentralised purchasing and contract functions, under the wide umbrella term of “Procurement”. A few calculations (refer Appendix A) were done to establish the impact of the Procurement function on the profit margin. The result is demonstrated in Figure 2. It was made evident that an approximate 5% reduction in purchase cost could result in a 50% increase in the profit margin. To obtain an equivalent profit from the traditional area of focus, at least the following must be realised:

- An increase in sales of 50%,
- A reduction of overheads of 20%,
- Significantly reduced staff numbers.

**Figure 2: Effect on Turnover**

![Figure 2: Effect on Turnover](image)

Reductions in the total spent on goods and services translate directly to the bottom line. Achievement of this impact requires recognition of procurement as a strategic function.

This means that an almost impossible improvement in the traditional area of focus is equivalent to a minor improvement in a historically “non-focus/non-core area” (Owen, 2001:5).

The realisation by Anglo American top management of these dramatic results, indicated two major new focus areas:

- Reductions in the total expenditure on goods and services translate directly to the bottom line
- Achievement of this impact requires recognition of Procurement as a strategic function.

Background

Anglo American has come to the realisation that optimising their relationship with their suppliers is of fundamental importance to their businesses. However, few companies in the world have been able to implement effective sourcing or supplier relationships on a consistent and continuous basis.

To understand the reach of the terms procurement and purchasing, definitions thereof are helpful (Smit, 2002b). Within the Anglo Group companies the two terms of procurement and purchasing is viewed as separate but interlinked processes to enable a company to effectively manage commercial relationships:

- Procurement: The process by which a company establishes commercial relationships with suppliers. This encompasses all the components of supply market sourcing, the establishment of contracts and the ongoing monitoring of supplier performance. This is increasingly known as Supplier Relationship Management (Smit, 2002b)
Purchasing: The process by which employees of a company order goods and services from suppliers. The process may include the use of e-procurement systems (Smit, 2002b).

Up to date, the processes associated with procurement and purchasing have been largely manually driven and consequently very costly processes within Anglo American.

The standard procurement environment within Anglo American can be summarised as follows:

- Transactional data not captured effectively or analysed effectively
- Labour intensive and entailing multiple processes
- Excessive numbers of suppliers to manage
- Disorganised supplier database
- Focus on internal expenditure, with minimum regard to external expenditure (traditional approach)
- Inconsistent management tools, for example spreadsheets, databases.

A basic example of the purchasing process within a division would be as follows:

- An electronic requisition is raised within an ERP-system
- The buyer source suppliers from existing database and process a request to quote, which is printed in hard copy and faxed to the suppliers
- The supplier answers by fax
- The buyer would negotiate on each proposed order to obtain cost reductions for the division
- An order is raised electronically and faxed to the successful supplier
- The supplier would be expected to deliver the goods/service
- The supplier invoices the division in original hard copy
- The accounts department would match the invoice to the order
• The supplier would be paid by cheque deposited into its account
• The order would then be completed.

Once the realisation was manifested that Procurement could substantially increase the profit margin, Anglo American made the decision to transform Procurement into a strategic and core business function. Streamlining this function would entail time saving initiatives to allow staff to utilise their negotiation and technical skills more effectively as well as staying abreast of technological advances in the field of procurement worldwide. After conducting a market analysis Anglo American made the strategic decision to focus on two major drives in the procurement field, i.e. strategic sourcing and E-Procurement.

Following the Project Angelo Base Metals Presentation June 2001, the first major drive, strategic sourcing, entails a common purchasing strategy between the respective groups within Anglo American (Coal, Gold, Platinum and Base Metals). Making strategic purchases and negotiating collectively for best prices would increase the holistic buying power of the group. This would be especially beneficial in the areas of fuels, lubrication, explosives as well as travel. Travel could be subdivided into airline fares, car rentals and accommodation. It is anticipated that global savings of between 5% and 10% is possible on travel expenditure alone (Dunn, 2001:3).

The second major drive is e-procurement and can be defined as the purchasing of goods and services as well as the management of the supply chain via the Internet, whereas e-purchasing would refer to the simple buying of goods and services through the Internet. Common characteristics of e-procurement are the following:

• It functions online
• It utilises common catalogues
• It has global capabilities
• It consists of a large pool of suppliers and buyers.

According to Franz (2001:37), the objective of implementing e-procurement within the company is to identify inefficiencies and inadequacies through the transparent processes, allowing elimination thereof, promotion of contractual compliance and ultimately achieving a "slick" supply chain. This can be effectively planned through the following:

• Simplifying the individual transactions of purchases
• Increase the responses and response times through less paperwork and on-line transactions
• Increased buyer/supplier network and networking.

E-procurement is one of the fastest mediums whereby the purchasing process can be streamlined and procurement enhanced to increase the profit margin.

With the above as backing, Anglo American embarked on an e-procurement project that will be implemented in its operations and divisions worldwide. This project was named Project Angelo.

The purpose of the Project is to firstly source high expenditure items and initialise on-line trading with these supplier partnerships. Ultimately all suppliers are to be connected electronically and interfaced with Anglo American. This will substantially decrease procurement costs within the group.

The e-marketplace selected by Anglo American to facilitate the trading is Quadrem. Quadrem is the first global mining, minerals and metals E-Market Place. It offers a base from which sellers and buyers can trade 24 hours a day and 7 days a week, regardless of the geography, language or currency (Anon, 2002b:2). This E-Warehouse provides an independent trading forum, never interfering in the transactions taking place, but only facilitating it.
Namakwa Sands is part of Anglo Base Metals in the Anglo American family. It has 3 sites, all on the West Coast, the first a Smelter situated 140 kilometres from Cape Town. The second is a Mineral Separation Plant, situated 400 kilometres north in the Koekenaap area. The last is the Mine Site, situated another 50 kilometres north at Brand-se-Baai. The company as a whole is totally committed to the upliftment of local communities and the development of businesses in the area. The major segment of the supplier base is locally based.

Problem statement

Taking the above into account, the need was raised to investigate the impact of e-procurement and specifically the rollout of Project Angelo at Namakwa Sands. This study is to include the effect on all suppliers, local, national and international, as well as customers and the company itself. As the supplier situation is almost identical on all three sites, the study was conducted on Namakwa Sands as a company, and not on any individual site.

Objectives of study

The first goal of this study is to establish the anticipated impact of the Project on the suppliers, company as well as internal and external customers. In the light of the remoteness of the areas concerned, it is anticipated that the effect of the Project on especially the local suppliers may be substantially greater than the suppliers in metropolitan areas. The following objective is to prepare the suppliers, company and customers for the rollout of the Project in light of the anticipated impact. Lastly recommendations for an effective and timeous rollout can be suggested.

The following research questions must be addressed to achieve above-mentioned objectives:
• What is the anticipated impact of the Project on the suppliers, Namakwa Sands as a company as well as on internal and external customers?
• What is actually required from the suppliers, the company and the customers to reach the project goals?
• What infrastructure do the company and suppliers require (hardware and software)?
• What is the perception of the suppliers, the company and the customers on the Project?
• What conclusions can be drawn and recommendations made to facilitate an effective rollout at Namakwa Sands?

Contributions of study

The rollout of Anglo American’s e-procurement drive in South Africa has, as of yet, been limited to metropolitan areas and high economically active areas. The launch of the Project at Namakwa Sands shall be the first endeavoured in a remote location.

Realising the impact of the Project shall enable Namakwa Sands as well as its suppliers to prepare themselves for the rollout and facilitate the transition period. Areas of concern can be identified and action plans set taking these into consideration.

Lastly, the rollout itself can be planned with knowledge of the supplier market and company characteristics. Possible problem areas can therefore be foreseen and minimised and the success of the Project be optimised.
Overview

After identifying the problem and discussing the background thereto, clear objectives were set as to what this study is to contribute. A thorough literature study shall assist in defining the theoretical background to the problem. This shall be accompanied by an empirical study to establish the practical situation at Namakwa Sands. All data shall be analysed and conclusion as well as recommendations drawn from these. Areas will be identified where possible studies or analyses may contribute to optimise implementation and daily operations.
Chapter 2: Theoretical Overview of E-Procurement

Introduction

'With continued softness in the economy and increased competitive pressures, companies are finding themselves besieged by investors and corporate boards demanding stronger financial results. This escalating demand for enhanced performance, coupled with the rising scrutiny and scepticism of the financial markets, indicates that fresh and creative approaches are needed to improve bottom line performance and maintain year-to-year corporate growth." (ICG Commerce Executive Series, 2001:1.)

Although the letter "e" has lost much of its language domineering swagger with the fall of the dot.com economy, it has now also opened a more realistic and mature perspective on the markets and financial environment. Avoiding the pitfalls of over eagerness, the economy recognises the potential of e-markets, but also attempts to establish its limitations when venturing into the portals.

What is E-Procurement and E-Purchasing?

These terms are often used interchangeable, yet is defined in most sources as two separate but inter-linked processes.

Definitions

According to Smit (2002b) procurement is the process by which a company establishes a commercial relationship with its suppliers. This shall include all components of sourcing of the supply market, establishment of contracts, as well as the ongoing monitoring of supplier performance. This concept is increasingly known as Supplier Relationship Management (SRM). Purchasing is however defined as the process by which employees of a company order goods and
services from suppliers. Above definition clearly details purchasing as the physical component of the total procurement process.

This definition is supported by Community B2B (Community B2B, 2002). Here procurement is defined as to refer to all aspects of buying of materials and services including but not limited to strategy, sourcing, purchasing and inventory control.

Purchasing here refers to the process of buying and may include spot purchasing using exchange or auction, as well as systematic purchasing utilising a catalogue mechanism or contract schedules. Once again purchasing is defined as a sub-component of procurement.

In short e-procurement would therefore refer to the online sourcing and buying of services and goods as well as computer enabled supplier performance management.

**Figure 3: E-procurement**

![Diagram of E-procurement](image)


E-procurement can be demonstrated by Figure 3, where supplier and buyer interact through a common media, namely the Internet and Internet supported
services. The supplier offers goods and/or services to the buyer. All documentation is processed via the Internet from buyer to supplier and supplier to buyer.

**Traditional Processes**

Traditional commercial relationships have been known to include a large number of multidirectional transactions. E-procurement proposes a simpler trail of interaction between supplier and buyer.

According to Gupta (2001:2) the following are some of the disadvantages of the traditional process:

- **Lack of integrated approach to procurement.**
  In a typical production environment, design does not take purchasing efficiency into consideration. Production also creates poor forecasts and/or communicates forecasts poorly as systems are not interlinked. This, in turn, leads to significant increases in costs, poor customer service, material shortfalls and disgruntled suppliers.

- **Lack of decision support for crucial procurement activities.**
  Procurement activities require system support in decision making, especially in areas such as contracts, supplier management, commodity management, supply chain design and inventory planning, i.e. e-business support.

- **Lack of visibility.**
  The single most crucial issue in procurement is the promotion of visibility across the value chain of the organisation. Procurement is to provide up-to-minute information of expenditure and most traditional processes are manual.
- **Maverick buying**
  Maverick buying occurs where buyers do not follow company guidelines dictating which suppliers to use for specific requirements. A typical example would be where the company have entered into a contract for the supply of certain items at discounted prices. Buying from alternate suppliers would result in paying a premium as the negotiated discount is lost. Gupta (2001:2) further states “Employees buying “off-contract” items generate approximately 30 percent of the indirect expenditure”.

- **Inability to tap into a large supplier base due to lack of structured content**
  Access and usage of large standard and custom catalogues are critical to expand the supplier base wisely, aggregating expenditure across the enterprise. In traditional processes, the management of standard product and supplier information have posed difficult challenges for buyers, mainly due to the manual upkeep of supplier base. In the e-procurement solution the supplier base is maintained electronically and all relevant information on the content, catalogues, orders placed, etc. of a specific supplier is administered by the system.

Gupta (2001:2) further proposes that initiatives to improve procurement processes have historically focussed on ordering processes. E-procurement’s predecessor, Enterprise Resource Planning (ERP) has retained a similar focus, namely the automation of purchasing process. Following the definition of e-procurement as not only focussing on the physical purchasing process, it becomes evident that traditional processes fall short of e-procurement.

**How does E-procurement work?**

According to Derome (2002:5) there are two major drivers for the changes in the procurement transaction market. The first and most influential is the emergence of the Internet. Derome (2002:5) contends that the Internet provides “an effective,
low-cost means of transporting mission-critical business information between systems”. The network quality of service required has been developed by software and service providers on top of the network. Data Transport costs can therefore decline substantially. The second driver of change is the emergence of technology standards like Java, XML and Web services. Traditionally the overcoming of communication barriers was costly and cumbersome. Above standards have removed substantial communication barriers and can therefore reduce partner integration costs.

Five essential steps in E-procurement functions

E-procurement functions by addressing the entire procurement value chain and not only the purchasing processes.

ICG Commerce Executive Series (2001:5-6) contends that there are five steps as detailed below.

- **Assess for insight and opportunities**
  A complete expenditure analysis must be conducted to provide detail of the company’s requirements, buying power, as well as the degree to which they are leveraging the power.

- **Source for savings**
  Once a company understands its expenditure and buying power, it can obtain savings through effective sourcing and thereby profitable procurement. A sourcing methodology should be compiled to address product specifications, standard buying practices, use of appropriate sourcing and negotiation strategy and establishing the total cost to company.
• **Enable buyers and suppliers to turn contracts into commerce.**
  The most effective way to e-procurement is through the establishing of, and buying from contracts. The organisation must have easy access to this information to prevent maverick buying.

• **Transact through management tools to capture savings.**
  The buyer still requires the ease and streamlining of processes when utilising the sourced advantages. Procurement solutions to placement of requisitions and orders, as well as receiving of invoices and subsequent payments must still be streamlined to increase cost effectiveness, visibility and system control. This view is supported by Spear (2002). He mentions that there exists three types of e-purchasing, namely people based orders, machine-based orders and strategic purchases. In his view it is especially where orders are placed by people, where businesses can achieve most benefit from e-purchasing as this process is traditionally manual, involving telephone calls, faxes, e-mails and paper-based catalogues. E-purchasing therefore translates to cost and process efficiency. Note that above mentioned specifically relates to the physical purchasing processes within e-procurement.

• **Manager continues improvements in order to maximise procurement performance.**
  Organisations need to drive existing improvement compliance and continuously seek industry best practise.

**E-procurement in Net Markets**

• **Horizontal Markets**
  These markets can be utilised by a wide variety of industries, which typically provide common services, such as financial services, benefits management and maintenance, repair and operating equipment procurement. Well-known examples of these markets are Ariba Network and Commerce One’s Market Site.net.

• **Vertical markets**
  These markets facilitate a specific industry with distinct characteristics and therefore unique requirements, such as the chemical or mining industry. Examples of these markets are Chemconnects for chemicals and Quadrem for the mining industry. According to Planting (quoted by Smit, 2002a) "Quadrem is a procurement initiative for the global mining, minerals and metals industries". When Anglo American embarked on its e-procurement initiative, it decided to invest in Quadrem as its medium wherein to transact. Quadrem therefore provides the electronic warehouse to facilitate trading, but is not involved as an active trading partner. This specific vertical marketplace was established by the world’s biggest mining houses, once again reiterating the global nature of e-procurement.

  **Procure-to-pay**

  As explained by Castelli (2002a:3) e-procurement in its current form comprises ten (10) business processes within its scope:

• **Request for Quotation**
  This is an electronic request for goods and/services sent from the buyer to the seller. It is sent directly between the two (2) parties and outlines any requirements the buyer may have. According to Ruthledge (quoted by Smith, 2002:1) the formulation of the scope of the request for quote is of utmost importance as unclear requirements may lead to over-time and over-budget orders, the so-called "scope creep".
• Quote
The quote is the seller’s online and direct response to the buyer’s RFQ. A quote can however also be sent by e-mail services.

• Order
This refers to the business process whereby a buyer requests from the supplier the delivery of goods and services as detailed in his quote. In traditional processes the order is usually faxed to the supplier. E-procurement however, incorporates this step in the ordering process, also occurs online or alternatively via e-mail.

• Order response
This application acknowledges receipt of the order or indicates changes to the order as received by the Supplier.

• Order status request
A subsequent message is sent from the buyer to the seller to inquire the status of the order. Above status request is an expediting function and substitutes or assists manual telephonic inquiries as to the on time delivery of goods and/or services as ordered.

• Change order
This is a message sent from the buyer to the supplier that indicates changes to the order. The change order function also replaces the previous manual fax of an order amendment.

• Order status response
Above refers to a message sent from the supplier to the buyer in response to the order status request. This can provide the buyer with notice of possible late deliveries or concerns on the order.

• Advanced shipping notice
This is a courtesy notice from the supplier to the buyer and informs the buyer of planned shipment or shipment in progress.
- **Invoice**  
  Payment terms have already been agreed to in the order stage. In above-mentioned process an invoice is created by the seller and is sent to the buyer for payment of goods and services. By automating the invoice production, calculation or copy errors are minimised, thereby simplifying the ease of payment.

- **Remittance advise**  
  This is the process whereby a trading partner is advised of payment for goods and/or services provided.

**Process Design**

Following Owen (2001:26) the basic function of e-procurement can be illustrated by *Figure 4*. The Buyer and seller are interlinked through a vertical market warehouse, in this figure Quadrem is illustratively used. Quadrem facilitates trading by provision of a catalogue facility. In this facility sellers can display their catalogues and authorised buyers can browse.

**Figure 4: Process Design**

![Diagram of Process Design]

As detailed in Figure 5, transactions occur as follows:

- An electronic requisition is raised within the organisation through utilising the specific business system in place, i.e. SAP, MIMS, etc.
- The request for quote is created in the business system and conveyed by a converter into the vertical marketplace (illustrative use of Quadrem).
- The supplier's system is then contacted via the vertical market. The supplier conveys a message back through the Internet, EDI, E-mail or fax.
- Further transactions transfer in similar ways.

**Figure 5: Transactions**

SAP R/3 with EBP eProcurement application  
MIMS Ellipse version with the Envoy Buying Application  
JD Edwards ActivEra with Active Procurement


**Regulation**

Marketplaces facilitating e-procurement specifically note that it does not facilitate aggregation of expenditure across different buying organisations; neither does it take over supply chain functions from their users (Anon, 2002:3). The market places only provide a platform or warehouse where transactions take place. This is confirmed by Microsoft Case Studies, 2001. In creating Bidvest's e-market place, mymarket.com, Microsoft and Commerce One Distributer Operations acknowledged the need for flexibility and allowance of different business rules.
The marketplace could not interfere, neither could it enforce conformity to its own protocols. The buyer and seller in the market, not the facilitator, therefore regulate the ethics and business processes.

**Partnerships**

“When considering an e-commerce implementation, in addition to world-class technologies, companies will do well to think beyond bits and bytes, considering the relationships they establish with providers of critical elements and expertise.” (Ironsode, 2002:1.) Whilst planning to implement an e-procurement solution, the business partnerships established in preparation as well as in the process are pivotal. Relationships with suppliers, exchange market providers as well as internal relationships must be considered at all times.

Lastly and in light of the above quotation it is important to build meaningful and sustainable relationships in e-procurement, not only with your buyer or supplier, but also the facilitating marketplace.

**The impact of e-procurement**

For a high adrenaline activity, commerce seems to be surprisingly conservative. The pace of change seems to be glacial at times. It took centuries, if not a millennium, to progress from barter to money-based transactions and once again a few centuries to advance from cash-in-hand to commerce with credit. The movement of commercial transactions into a virtual reality is, in light of the above, understandable daunting. The question therefore arises: What is the driving factor, which convinces companies to launch e-procurement?

Lawlor (2002:1) captures the essence of the driving force when commenting on a Price Waterhouse Coopers report, namely that electronic procurement is the “low hanging fruit” of cost reduction in modern business. He further states that
although South Africa may be lagging behind their counterparts in Europe and America, the same benefits are sure to follow. It was further found in this report that 441 of South African companies have launched some form of e-procurement, which is not much below the global figure of 481. On the positive side, South African businesses are committed to address their procurement processes, with 66% actively changing the current systems and 85% rationalising their inventories.

According to Eedes (2002:1) South Africa is in the early phases of the e-commerce acceptance and adoption cycle and the shape of future developments are yet to be decided. It is however agreed that e-commerce plays an increasingly important role in the future and sustainability of companies.

ICG-Commerce Executive (2001:1) describes e-procurement as a high reward, low risk opportunity and motivates as detailed below. Companies typically spend 50% to 60% of their revenue on procurement of goods and services. Even small cost improvements to these expenditures can yield significant results. This point is confirmed in chapter 1, page 1 & 2.

When comparing the risks involved in these cost reductions, it is dramatically lower than typical examples of decommissioning plants and lay-offs.

These views are supported by Spear (2002), when reporting that e-purchasing alone can result in a 5% to 10% reduction in material and service expenses. Spear further explains that e-purchasing creates efficient and cost-effective processes, which translates into savings impacting on bottom line.

Companies that implement e-procurement practices can realise savings up to 13 times greater than their investment in the technology, applications, implementation and change management (A.T. Kearny Study, 2002:1). This was found in a study of 147 large companies within 22 industries and on 6 continents.
It further detailed that the 2002 Assessment of Excellence in Procurement found that an expenditure of $1.5 billion on e-procurement would yield savings of $19.1 billion. "At that rate, A.T. Kearny estimates global 500 companies could save $330 billion annually by capturing e-procurement's full potential" (A.T. Kearny Study, 2002:1).

Although these figures seem staggering, it is echoed by Owen (2001:5). The impact of e-procurement cannot be denied when reviewing reports on the cost reductions. Although companies may differ in size and composition, a substantial cost reduction should be reflected.

Advantages and disadvantages of e-procurement.

To understand the effect and possible impact of an e-procurement solution on a company, it is useful to investigate both the positive and negative aspects thereof.

Advantages

According to the A.T. Kearny Study (2002:1-4) companies can drastically improve their bottom line results by developing an e-procurement proactive approach to sourcing, purchasing and supply chain management.

In the same study the following advantages were identified when leveraging e-procurement:

- Reduction of up to 10% of costs for items acquired using e-sourcing tools to support strategic sourcing programs.
- Reduced order cycle times by 41% through the use of e-catalogues and end user ordering.
- Reduced supply management head count up to 10% through elimination or automation of low-value activities.
Smit (2002b) named the following advantages when transforming traditional processes into e-procurement activities:

- Streamlining of request for quote process and thereby eliminating manual processes.
- A positive feedback cycle can be established as collaborative information is available which can be shared with suppliers.
- Purchasing officers become commodity and/or contract specialists as their activities become more strategic and less transactional.
- Information can be effectively leveraged to reduce the cost of business in the supply market. All expenditure can be captured and analysed.
- Contract establishment and coverage can be improved.
- Segmentation and continuous improvement of the supplier base can lead to a reduction in non-performing suppliers and the introduction of new suppliers where the need exists.
- Supplier profiles and contacts can be created and maintained on a central electronic database.
- Strategic relationships with key suppliers can be established and more effectively managed.
- Supplier award schemes can be introduced to recognise and reward performance.

In simplified form, Owen (2001:7) summarised benefits as to entail the following:

- Process enhancements through automation, simplified transactions and reduction of transaction costs.
- The facilitation of reverse auctions and disposal.
- Last, but not least, savings on goods and services.

Owen further mentioned that when strategic sourcing is applied within the e-procurement framework, it can also result in benefits such as savings, common procurement strategies and increased buying power.
The Net Markets can provide advantages uniquely within its sphere. These advantages can be classified as to belong to two (2) wide categories, namely supplier benefits and buyer benefits (Anon, 2002b).

The benefits for suppliers can be detailed as follows:

- **Increased opportunities**
  The supplier has a single access point to a global buyer's pool, which also provides him with more in-depth knowledge of and exposure to customer/buyer requirements.

- **Increased efficiencies**
  The supplier can obtain an improvement in his efficiency through reduced transaction, marketing and sales costs as well as improved customer services.

- **One stop solution**
  E-commerce processes are streamlined by the creation of consistent standards and on a technical level, the using of a single hub connection.

Buyers also encounter specific benefits when utilising a Net Market facility:

- **Improved business processes**
  The above is achieved by improved expenditure control and improved contract compliance.

- **Enhanced channel efficiencies**
  There exist real benefits in the standardisation of technology, data and logistics. Furthermore access to a global supplier base can reduce cost of identifying new suppliers.
• **Increased purchasing efficiencies**
  
  Data errors are minimised when utilising an effective online exchange. Decreasing transactions and thereby reducing order completion costs also reduce costs.

**Disadvantages**

According to Gupta (2001:1) e-procurement is rife with concerns such as a lack of systematic and integrated planning of implementation, a lack of technical support and maintenance as well as process disconnectivity. Yet, when searching for support within alternative sources, little literature could be found on disadvantages of e-procurement. Whilst a new development and trend, plentiful data exists on benefits and advantages, creating discomparity in literature.

References were found to costs involved when building a private online exchange, instead of utilising Net Markets (Castelli, 2002a:3).

In general it is found that advantages are numerous and the collective impact of these benefits dramatic. Costs associated with e-procurement do however seem to be substantial and creates uncertainty and hesitation in both buyer and supplier.

**Implementation of e-procurement**

Lawlor (2002:1) quoting Franke, Price Waterhouse Coopers’ direction for e-business services in South Africa, provides some valuable statistics on e-procurement within the country. In South Africa 66% of companies believe that e-procurement can better position them in the market. This compares to a figure of 73% globally. Local companies are, however, more critical of the concept than overseas counterparts. 60% agrees that e-technology is over-hyped (against 53% globally) and 44% (against 27% globally) views e-business as a luxury, not
a necessity. Despite the above negative responses, half of South African organisations still believe that they will be utilising e-procurement facilities within the next two (2) to three (3) year period.

The implementation of e-procurement should follow a normal well-planned and thought through project route.

Community B2B (2002:6) acknowledges the diversity of buyers, sellers, trades and degrees of readiness to conduct electronic business. It therefore proposes a generic project management outline:

- **Planning and investigation**
  Research should be conducted to analyse the company’s market, its expenditure and different e-solutions.

- **Implementing and deployment**
  Once a solution has been selected, implementation and deployment strategies should be formatted.

- **Change management**
  Users of the e-solution must be properly inducted and familiarised with it.

- **Maintenance and upgrading**
  Once e-procurement is implemented, the system should be properly maintained and upgraded where necessary to ensure sustainable developments in this area.

Some generic actions have been listed by Parker (2000:9) to follow in an implementation plan:

- **Research and development**
  This includes areas such as resources committed or planned and expected results.

- **Facility requirements**
  Infrastructure such as computer hardware and software, hubs, service providers, etc. should be considered.
• **Capital needs**
  Equipment and implementation costs must be evaluated closely.

• **Critical processes**
  Points to consider in this regard are capacity and critical paths.

A more applied e-procurement implementation plan is provided by Smith (2002) and is called the “10 Commandments of Rigorous Requirements Gathering for B2B Project Implementation”:

• Define what your expectations of the new system are.

• Specify the do’s and don’ts of the new system in terms understandable to all partners involved, for example users, technicians, vendors, management.

• Provide stakeholders the opportunity to state their needs and concerns.

• Conduct a step-by-step simulation with users.

• Conduct a hands-on examination of existing systems to identify current problems and advantages.

• Business and functional requirements should be addressed in two (2) separate sections for ease of reference.

• Overlapping needs and requirements between users and business and functional requirements must be clarified and cross-referenced where necessary.

• To promote consistency and clarity the use of standard formats should be encouraged.

• The overall purpose and scope of the project should be clearly defined and documented with table of contents and user distribution lists.

• All user groups should be included in implementation.

Eedes (2002:1) notes that Consultants Ernst & Young Cap Gemini identifies some factors behind failure of B2B exchanges. In any implementation it can be worthwhile to consider these as to prevent re-occurrence thereof. It is noted that companies seemingly underestimate the time, difficulty and impact to implement
new technology. In some cases the traditional processes of procurement differ substantially from the e-procurement exchanges. This can impact drastically on procurement efficiency during the implementation period. Secondly it is also acknowledged that companies experience difficulty in the set-up and marketing of their chosen Net market to specifically their supplier market. The supply market has the same concerns regarding cost, upkeep of customer services and so forth, that the buyer market experience.

These views are echoed by Castelli (2002c:4). Many e-market places gain members slowly due to some of the following reason:

- The general level of industry technology maturity and adoption lagging behind in South Africa.
- Too little user support to establish a recurring customer base.
- Lack of industry knowledge and expertise e.g. lack of mining trade knowledge.
- Flawed pricing models for members to subscribe.
- Over-dependence on core founders and partners for business transactions.
- Reliance on advertising or transaction fees as sole sources of revenue for sustainable development.
- Difficulty in convincing buyers to place sufficient transaction volume over the online exchange facility. Generally buyers are hesitant to do all business on the exchange and only select certain transactions.
- Difficulty in convincing suppliers that e-marketplaces would assist and not deter customer relationships and service.
- Difficulty in convincing suppliers that their products would not be commoditised.
- Flawed business models.
- Lastly, but not least, convincing suppliers and buyers that security is adequate and products, preferential pricing and restricted information would not be jeopardised.
Successful implementation of e-procurement was found in several case studies.

According to Anon (2002c:1) Weidmüller's implementation of e-procurement was cited as one of these. Weidmüller is a global manufacturer of electric and electronic wiring components. This company chose Ironside to partner in an e-business solution, as this exchange offered a direct, interactive, real-time link between buyers and sellers. Once again the importance of partnerships was stressed "the relationship one forges with solution providers are absolutely key constituents of any successful e-commerce strategy" (Anon, 2002c:1).

Technically, Weidmüller decided to provide suppliers with a comprehensive, yet controlled facility. Comprehensive as far as it relates to them directly, controlled as it denies them access to information on other suppliers and users.

Lastly, it was emphasised that when selecting a strategy for the e-procurement solution and implementation, a company must already have an eye set on the future.

Anon (2002a:1-2) describes an extremely successful implementation of B2B at FedEx and quotes Chris Cawein, the Manager of FedEx Business Systems as follows: "Ariba Buyer enables FedEx to lower costs by simplifying internal procurement processes, reducing purchasing cycle times, and decreasing costs. By creating greater purchasing efficiencies for many of our core commodity products – such as PC's, office supplies, and vehicle parts – we are able to better our service to our internal customers while lowering overall costs." (Anon, 2002a:1).

FedEx acknowledges that it had shortcomings as far as its internal processes were concerned, especially within the procurement and related financial fields. It was decided to seek an e-procurement solution to streamline these processes.
The company set very clear requirements as to what it wanted the solution to provide. It required a system that could exist in the heterogeneous computing environment within FedEx, it should streamline processes, be able to grow with the company and be focussed on user satisfaction.

The Ariba B2B Commerce Platform and the Ariba Buyer were selected. Close partnership followed in the planning phase. A strategic decision was made, which defies most literature on implementation period, namely that the physical installation and rollout of the e-procurement system should be completed in a one-month period to minimise disruption of operation. The installation went smoothly and quickly.

Ariba assisted FedEx in user training and change management. A further factor contributing to the success was identified as the cooperation of all end users to minimise disruptions within the procurement environment.

Lastly, the FedEx–Ariba partnership is sustained beyond maintenance responsibilities as they are closely working together to plan and create solution for their shared global futures.

**Summation**

In conclusion it can be noted that the impact of implementing an e-procurement solution as well as the advantages as discussed above, all reiterates the need for companies to reassess their key focus areas. An initiative to streamline the purchasing, procurement and supply chain management functions can impact positively on the bottom line and thereby increasing the profit margin of companies. In the examples of implementations as discussed above, it can be noted that effective rollout of initiatives is achievable.
Chapter 3: Empirical Study

Introduction

In order to meet the requirements of this project, the empirical study was divided into two (2) sections. The first segment contains the supplier data obtained from the Materials Management Department at Namakwa Sands, as well as the identification of focus areas for the analyses thereof. The objective with the second segment is to obtain information from suppliers, end users and Materials Management for analyses.

Methods used in this research

First segment

Data obtained from the Materials Management Department has been accepted as accurate, due to regular audits conducted internally and externally to test the authenticity thereof. Values and data obtained are however often not in a user-friendly form. It therefore has to be screened and processed to be meaningful in this Project. Namakwa Sands is currently still in a transition phase from project to production, explaining the lack of fine-tuning in some reports and data.

The Microsoft Excel package shall be utilised to screen, sort and process all data obtained from the Materials Management department. Excel was chosen for this process as it provides firstly an adequate mathematical calculation ability and secondly an efficient data sorting facility. Its specialisation in spreadsheets makes it a powerful tool to arrange information.
**Second segment**

The information gained in the second segment on suppliers, end users and Material Management shall be used to answer the research questions stated in the objectives of the study.

Although there are various methods of collecting data, two (2) were identified as suitable for this Project’s purpose, namely interviews and questionnaires.

**Interviews:**

Interviews were chosen as the means of information gathering on suppliers, as the Materials Management Department confirmed that most of the suppliers do not respond to information or documentation not directly related to their orders and/or contracts. Furthermore information sessions on the launch of Project Angelo were also scheduled for the suppliers. This was the perfect opportunity to interview suppliers and address objectives in this regard. These sessions also provide a platform from which to observe the interaction between Project Angelo representatives and the suppliers and establish a general atmosphere amongst the suppliers.

As mentioned by Cummings & Worley (2001:115), there are some definite advantages as well as disadvantages in using interviews for an empirical study.

When discussing advantages the following can be mentioned:

- Probing and clarification is an essential part of the interview. If any uncertainty exists on a response it can be further discussed and defined.
- The above flexibility allows the interviewer the opportunity to establish private views and feelings. It is therefore a source of “rich” data, which can provide valuable insight.
- An interview further allows the establishment of a rapport with the interviewee. If the interviewer is observant, the process can be emphatic
to the interviewee, which may result in return in an openness to provide valuable data not gained through formal data collection methods.

There are however also drawbacks inherent in the interview process:

• The first and most obvious disadvantage is the amount of time involved in conducting an interview as well as the consequent analysis thereof. It could become a very tedious process if the interviewers choose to take full advantage of the opportunity to hear respondents.

• A second and very real concern is personal bias that may play a role in the interviewer’s conducting of an interview as well as the analysis thereof.

• Interviews can also become subject to the self-report biases of respondents. The more personal nature of the interview may influence the interviewee to be biased as to self-image and promotion.

The conducting as well as interpretation of interviews must therefore be done with care, caution and objectivity to leverage the advantages inherent therein, but also to limit the disadvantages in the chosen procedure.

**Questionnaires:**

The second method that shall be utilised for data collection is questionnaires. This method shall be applied to information required from end users and Materials Management staff.

This method was selected as the groups involved here are in-house and better responses were therefore expected than with the suppliers. The process involved is also faster, which complements the more tedious process chosen for the supplier data collection. End users as well as Materials Management staff can respond in own time and are not restricted to specific times as with interview schedules. A cut-off time is however set to ensure that all required information could be gathered.
Advantages of this method includes the following:

- It is regarded as a very efficient method of gathering information as responses can be analysed quickly.
- Quantity comparisons and evaluation can be done as it facilitates large samples.
- Personal bias and emotion that could influence an interview is limited when utilising this method.
- It is an inexpensive method of data collection.

As in every methods disadvantages can also be identified:

- Responses are limited to the questions asked in the questionnaire. There is therefore little or no opportunity to probe for additional information or clarification.
- Questionnaires tend to be impersonal.
- Response bias can also be created, for example by answering in a socially acceptable manner.

In the interpretation of questionnaires it must be guarded that it is not over analysed. Attention must be given to identify possible situations compromising the accuracy of the responses.

When gathering the necessary information by using the selected methods, the positive as well as the negative aspects of each method must be kept in mind. Limitation identified during the process must be recorded.

**Detail of chosen procedure**

The chosen methods for the empirical study are discussed below:
First segment

When focussing attention on the supplier base, the most basic action would be to establish what the base consists of. An in-depth study in this regard could reveal the focus areas where maximum benefit can be obtained. This will impact on cost reductions and ultimately improvements in the bottom line.

The following information shall be gathered from the Materials management department:

- Total procurement expenditure
- Quantity of suppliers/size of the supplier base
- Distribution of suppliers based on location
- Expenditure range of suppliers in total
- Expenditure range of suppliers based on location
- Expenditure range of suppliers based on product
- Amount of stock items purchased per annum/usage of stock items
- Prices of stock items

Abovementioned data will be sorted, screened and processed with the aid of Excel. A vast amount of data shall be transacted in a spreadsheet format. Once this data is converged into meaningful information, it shall be utilised in the construction of graphs to assist in the quantification and highlighting of focus areas in the supplier base.

The following graphs will be detailed to assist the explanation of the supplier base:

- The amount of top suppliers as a percentage of total expenditure. This shall be done dependant of the percentages involved, e.g. top 10, top 20, top 40, top 80, etc.
- Different types of suppliers as well as percentages expenditure to total expenditure.
• The average expenditure of a supplier in respective categories
• The amount of top suppliers as a percentage of total expenditure but categorised in respective classes.
• Amount of stock and non-stock expenditure as a percentage of total expenditure.
• The amount of top suppliers, detailing the stock expenditure as a percentage of total expenditure.

These graphs shall assist in the indication of focus areas pertaining to the suppliers. When focus areas are identified, the information can be utilised to assist in the planning of implementation of the e-procurement initiative as well as the prior identification of concerns in this regard. Improved and sustained efficiency can be identified, as a thorough quantifiable knowledge has been established of the role players in the supplier base.

**Second segment**

To ensure a proper understanding of all the role players, further information should be gathered.

As previously discussed interviews will be conducted with suppliers. These suppliers will be interacted with on a one-by-one basis. The interviews have been scheduled during the project Angelo/Quadrem information day to be held for the suppliers. During this briefing session, suppliers will be introduced to the Project Angelo drive in Anglo American and specifically the Base Metals division. They will be inducted into the functionality of the site and subscription as well as information on fees will be provided.

The reactions of the suppliers during these sessions will be observed and documented. Thereafter the interviews will be held and questions asked following a general interview guideline as detailed in Appendix B.
The supplier interviews will have three (3) areas of focus, namely knowledge, infrastructure and attitude. During the interviews, the interviewer shall keep personal notes and allocate a score to the specific topics raised as detailed in the guideline. The allocated scores shall range from one (1) to five (5), with one (1) representing a very low or negative score and five (5) the opposite. Three (3) shall be an indication of neutrality and agreement, whereas two (2) and four (4) will represent moderately low and moderately high scores respectively.

The interviewer shall address all the areas in the guideline by asking questions or evoking discussion thereon. As example, knowledge of the Internet shall be addressed as follows:

Questions will be asked to determine the supplier’s Internet literacy. The degree of difficulty in the question will depend on the answer in the previous question. If uncertainty is observed, the interviewer must minimise technical questions to prevent the interviewee from becoming uncomfortable and therefore withdrawn. If a question is however answered with confidence and further information is required, it must be probed deeper.

When probing is conducted as detailed above, the margins for errors in classification are minimised. There are also key questions that can be asked to establish a supplier’s knowledge level in a specific area. The interviewer should however be sensitive enough as to know when to stop. Adequate and detailed data can be collected when concentrating on both key questions as well as the valuable information and attitude and information conveyed via the supplier’s body language.

Lastly, the interviewer must have in-depth knowledge of all areas probed. If this is not the case, the ratings and assessments would be invalid and unjustified.
On completion, all the data collected must be combined and utilised to establish a general guide as to the attitude, knowledge and infrastructure of the suppliers already categorised in the supplier base. This focus will enhance the data already collected by means of research reports.

With regard to the remaining user groups, selected end users and Materials Management staff shall be provided with a questionnaire. It must be noted that different questionnaires are drafted for the two groups as the areas to be addressed for implementation may vary. The respective questionnaires can be found in Appendix C and D. Questions were formulated to obtain information on focus areas. These areas can then be addressed to ensure a smooth implementation. If it is, for instance, evident that a lack of basic knowledge regarding e-procurement exists, information sessions can be scheduled for the user groups prior to rollout.

Information here obtained can dramatically influence the rollout of an e-procurement initiative. By analysing information obtained from the empirical study, problem areas can be highlighted and conclusions drawn. Recommendations made in this regard may then be addressed in the formulation of action plans, the final and most important objective always in mind, namely to ensure a smooth rollout and successful implementation of e-procurement at Namakwa Sands.

**Limitations of chosen procedure**

In any study it is important to be aware of the limitations in procedures and circumstances. This will assist in valid results analyses as well as the rendering of accurate recommendations.
First segment limitations

Some limitations were identified with reference to the first segment of data collection. Namakwa Sands is, as mentioned before, in a transitional phase from project to production. In the project phase of inception, the Materials function was managed from Anglo American Head Office in Johannesburg. The bulk of the current Materials Management staff was only employed in February 2001. In this period the Materials Management function was newly implemented. The result of this situation is that information has only been captured for a period of twelve (12) months, the first six (6) being an inception period.

Furthermore, it was also found that processes could not be analysed for a period longer than a year as the data would be too bulky to effectively analyse in a spreadsheet format. Current procurement processes also do not provide the information off hand.

Second segment limitations

With regard to suppliers it was identified as a concern that no international suppliers were interviewed. Yet, as they comprise only a small percentage of the total supplier base, this is not considered to have a major impact on results.

When interviews were discussed as method on data collection, it was already mentioned that the process is time consuming. Due to the amount of suppliers interviewed, a general view can be established but string individualistic views may not be analysed in depth.

It was accepted that the conducting of the interviews after an information session on Project Angelo and therefore e-procurement, might influence the supplier interviews. It was however noted that the information session was an opportunity to gather a large and representative sample of suppliers, which would be very difficult under normal circumstances. It is therefore noted that on some aspects
addressed in the interviews, the honesty and integrity of the suppliers were trusted and answers accepted as a true reflection of their knowledge and perceptions.

The questionnaires submitted to end users and Materials Management staff must be analysed considering the possibility of group pressure. As it is a close working community, it may be that questionnaires are discussed and views are influenced by peer pressure. It may also be that a questionnaire was completed after a very positive or negative experience of one of the aspects addressed therein. If a problem has for instance occurred with an important delivery, although it may be a once-off concern, the end user may be negatively inclined towards the Materials Management department or the supplier. This may influence the score allocated in the questionnaire.

**Summation**

It is equally important to know what you study as well as how you propose to conduct that study. Detail as the procedures chosen can assist in accurate analyses and conclusion.

The importance of limitation of procedures cannot be overstressed as this will add to objectivity and minimise inaccurate results.
Chapter 4: Results Analyses, Interpretation, Conclusions and Recommendations

Results Analyses and Discussion

Following the empirical study, results from both segment 1 and 2 can be analysed and interpreted. Conclusions and recommendations can also be derived.

Procurement Reporting

The first section of the empirical study pertained to the supplier base. It was found that Namakwa Sands has a supplier base consisting of more than three thousand (3 000) suppliers.

The study was however based on the suppliers that were active at Namakwa Sands during the past year, i.e. suppliers that did business with the company in this period. The motivation for this decision was discussed before, namely that data may not be available or trustworthy and analyses of the size would be limited.

Taking the above into consideration, it was found that there was 1 406 suppliers active in the past year. The majority of the inactive suppliers were either part of the initial construction process and commissioning of Namakwa Sands or had once-off transactions with the company.

Using the active supplier base and combining all the individual contributions, it was found that the total expenditure for the last year was approximately R460 million. The next logical step was to determine the impact of the suppliers that have financially the highest impact on the total expenditure.
At this point the data was analysed and grouped in workable segments to obtain user-friendly information. The impact of the suppliers with the highest expenditure during the last year was depicted in Figure 6 as a percentage of the total expenditure. These suppliers were grouped as follows: top 10, top 20, top 50, top 100, top 200 and top 450. The top 10 suppliers are therefore those suppliers with the highest expenditure. The same applies to the subsequent groupings.

**Figure 6: Contribution to Total Expenditure**

It is evident from Figure 6 that there are a handful of suppliers that contributes almost half of Namakwa Sands’ procurement value. The top 10 (0.71% of active supplier) has a 47.39% share in the company’s expenditure. This effectively means that less than one (1) percent of the active suppliers constitutes half of the expenditure. The same trend follows in the subsequent segments. The top 450 constitutes about 98% of the total expenditure. It can therefore be stated that less than a third of the active supplier base is responsible for almost all of the procurement expenditure at Namakwa Sands.
This information is very important when constructing a focussed supplier group when planning a briefing session or user induction training. It would imply that when the company launches its introduction sessions and invite only the top 200 (14% of all active suppliers), the company would still be addressing an expenditure base of more than 90%. It is therefore evident that key suppliers make up the bulk of expenditure. The majority of the suppliers are widely spread along the five figure Rand (10 000's) expenditure range.

Although the amount of suppliers that are responsible for the expenditure have now been identified, little is known about the location of the suppliers, i.e. local, national and international. The areas are grouped as follows:

- Local: Vredenburg-Saldanha-Langebaan municipality, Hopefield, Moorreesburg and Malmesbury area, Vredendal-Lutzville municipality, Citrusdal and Ceres area.
- National: All areas within the boundaries of the Republic of South Africa, but excluding the local areas.
- International: Areas outside of the boundaries of Republic of South Africa.

Figure 7: Composition of Total Supplier Base
Purely looking at the amount of suppliers, the composition based on location can be observed in Figure 7. It is evident that the majority (85%) are national suppliers. This is widely accepted due to the remoteness of Namakwa Sands sites. Almost one sixth (14%) is local suppliers and less than one percent (0.6%) are international suppliers.

To ensure proper time management and representation of total expenditure (98%), the basis of the top 450 suppliers was used for the calculation to obtain the expenditure split between the three regions.

It is interesting to note that the expenditure per region, as detailed in Figure 8, follows the same trend as the amount of suppliers per region. On the national front, the expenditure (83%) is close to the percentage of suppliers in this region. There is then a slight drop in percentage when observing the local segment (12%). There is however a major difference on the international front, where 1% of the suppliers is responsible for five percent of the expenditure.

Figure 8: Composition of Expenditure per Region (top 450)
To better understand the supplier base, the average cost per supplier per region was calculated in Figure 9. Here it is evident that the amount of money spent per supplier is much higher on international suppliers than on local or national suppliers. The average R4.3 million per international supplier is more than 4 times more than the R1 million per national supplier and almost 7 times more than what is spent on local suppliers (R641 000.00). This trend to spend large amounts on a limited number of overseas suppliers is however common within the mining environment.

![Figure 9: Average Expenditure per Supplier](image)

These figures should be kept in mind when conducting surveys as well as planning implementations. Although the amount spent on international suppliers is only five percent, the value per supplier is very high. Care should therefore be taken when dealing with international suppliers and all the necessary protection should be obtained.
To further the understanding of the supplier a graph is shown in *Figure 10*, depicting the percentage of total expenditure per region on a top expenditure base. The individual pie charts for these top expenditure scenarios can be observed in Appendix E.

*Figure 10: Percentage Distribution of Total Expenditure*

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
<th>Top 20</th>
<th>Top 50</th>
<th>Top 100</th>
<th>Top 200</th>
<th>Top 450</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International</strong></td>
<td>7.19</td>
<td>7.85</td>
<td>5.23</td>
<td>5.53</td>
<td>5.12</td>
<td>4.82</td>
</tr>
<tr>
<td><strong>National</strong></td>
<td>89.26</td>
<td>62.71</td>
<td>62.71</td>
<td>63.53</td>
<td>63.66</td>
<td>63.27</td>
</tr>
<tr>
<td><strong>Local</strong></td>
<td>3.55</td>
<td>9.28</td>
<td>11.06</td>
<td>10.95</td>
<td>11.20</td>
<td>11.90</td>
</tr>
</tbody>
</table>

When following the trends in abovementioned graph it is evident that the local suppliers do not play a major role in the highest expenditure suppliers (top 10). As from the top 50 (74% of the total expenditure), the distribution between international, national and local fluctuate minimally. This indicates that the highest expenditure items are rarely associated with local suppliers.

Including more than the top 450 suppliers in the graph will still have minor impact as the base already represents 98% of the total expenditure. The inclusion of the 2% will therefore have little to no knowledge on the trend observed.
An important segment in the e-procurement drive is to know what the stock and non-stock ratio is in the composition of the total expenditure. In this scenario all the stock ordered during the last year as well as the respective prices were utilised to calculate the total stock contribution to the expenditure. In Figure 11 it can be seen that 39% of the total expenditure was stock purchases.

**Figure 11: Composition of Total Expenditure: Stock & Non Stock**

![Pie chart showing 61% for Stock and 39% for Non stock]

Usually such a distribution is not regarded as a healthy ratio. In a perfect procurement world it would be preferred that almost all expenditures were stock related. In the light of the above, a 40:60 split scenario is not satisfactory and should be addressed. It may be that goods are ordered as non-stock items, whilst they are catalogued. If this were the case, e-procurement would assist in this concern.

A comforting aspect is that by observing the trend in Figure 12, the deduction can be made that the top 10 suppliers contribute 73% of the stock expenditures.
Above is a comforting notion as the majority of high expenditures are done via stock purchases. Following the trend it can be concluded that stock times fall under the high expenditure items and the majority of non-stock orders on the lower expenditure base.

**Figure 12: Expenditure within Supplier Segments**

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
<th>Top 20</th>
<th>Top 50</th>
<th>Top 100</th>
<th>Top 200</th>
<th>Top 450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock</td>
<td>73.07</td>
<td>78.15</td>
<td>83.88</td>
<td>87.34</td>
<td>90.44</td>
<td>93.84</td>
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<tr>
<td>Total</td>
<td>47.39</td>
<td>52.39</td>
<td>73.61</td>
<td>82.98</td>
<td>91.32</td>
<td>97.77</td>
</tr>
</tbody>
</table>

To ensure a smooth e-procurement rollout, it is not only necessary to know the constituency of the supplier base, but also the perceptions, knowledge and attitudes of those suppliers. Furthermore it is also required to know the perceptions, infrastructure and knowledge of the end users and Materials Management Department regarding e-procurement.

**Suppliers**

The top 200 suppliers were invited to one of Project Angelo’s information sharing sessions. For this exercise 43 of the suppliers that attended were interviewed.
Time constraints allowed minimal use of probing and these finding can therefore be utilised as a general guide rather than absolute percentages of compliance.

Materials management personnel were utilised to assist in the identification of national and local suppliers during this session, which assisted accurate observations during the presentation and questionnaire sessions. Valuable information can be collected by the following:

- Observing the suppliers' reactions
- Observing interaction with the presenters
- Identifying the type of supplier.

Firstly, it could be seen that the national suppliers seemed more knowledgeable than the local suppliers on presentations that were made. The type of questions asked by national suppliers also confirmed this observation, as it was more in-depth and technical.

Three focus areas were identified to address during the interview, namely knowledge, infrastructure and attitude. During the interaction with the suppliers the following conclusions could be drawn from their responses:

**Knowledge**

- **Computer software**
  Approximately 80% of the interviewees have a basic and working knowledge of the basic software on the market. 10% of interviewees have an in-depth knowledge and utilised software to their added benefit, whereas approximately 5% (2 suppliers) self-admittedly have no knowledge.

- **Computer hardware**
  56% of the suppliers interviewed have a general knowledge of what a computer consists of and 10% an in-depth knowledge of hardware
requirements. 29% of the interviewees know only what they see on the outside of the computer, e.g. mouse, screen, keyboard, etc.

- **Internet**

63% of the interviewees could utilise the Internet for basic functions and also possess a basic knowledge of the purpose and use of the tool. 19% know of the Internet, but have not yet used it. This aspect was also difficult to qualify, as insufficient probing was done to substantiate whether this segment would know how to operate the Internet if confronted with the need. 14% of the interviewees were self-sufficient and very knowledgeable about the Internet.

- **E-procurement**

This aspect was understandably difficult to measure as the interviews were conducted directly following the information session on Project Angelo, thereby contributing to e-procurement knowledge. Although an interviewee may have not known anything about e-procurement at the inception of the presentation, he would have at least a basic understanding after participating in the presentation. This point therefore relied on the honesty and frankness of the supplier.

47% had no prior knowledge of what e-procurement entails. 21% knew what it was, but have no exposure thereto and 23% are currently exploring ways to implement e-procurement in their own companies.

- **Namakwa Sands requirements**

This point was raised to establish whether the supplier knows what equipment, materials and services Namakwa Sands require as well as what service levels are expected. As could be expected most suppliers had a fairly good knowledge (84%) of what the company requires as far as the product they currently deliver or service they provide to Namakwa Sands. They had however little to no knowledge as to services and materials required outside the fields they are currently supplying. 12% of the interviewees do however have some knowledge of general Namakwa Sands requirements. This can be interpreted in several ways. Firstly,
suppliers are not adequately diversified. Secondly, it could also indicate that inadequate information sharing exists. Thirdly, suppliers may just not be interested in what Namakwa Sands require outside their companies’ direct scope. There was insufficient time to establish the most common reason for above finding.

Infrastructure
The next step was to acquire information as to the supplier’s infrastructure:

- **Computer hardware and software**
  This area is difficult to qualify as more than 90% of the respondents indicated that they have computers in their businesses, but only approximately 60% can give information on their infrastructure. In wide terms it could be said that 50 to 80% of suppliers have the basic infrastructure required to implement e-procurement.

- **Employees’ computer skills**
  40% of interviewees have little to no knowledge of their employees’ computer skills. Some indicated that they think that the employees have adequate skills, but they are not certain of this. 53% of the suppliers confidently stated that their personnel have adequate computer skills at present to accommodate e-procurement initiatives. The figure of 53% must be seen in correspondence with the knowledge question counterpart. As 80% had general knowledge of software, it can be accepted that the 53% may be a fair reflection.

- **Degree of automation in procurement processes**
  14% of the interviewees have some version of an automated (software) system that keep track of their supply chain as well as various aspects of their broad materials management functions. 63% utilise spreadsheets to manage their order functions. The rest of the suppliers were either unsure or had a manual system in place, e.g. logbook type.
Attitude
The last segment of the interview was focussed on the attitudes of the suppliers:

- **Buy-in on Project Angelo**
  Following both the atmosphere during the presentation as well as the discussion in the interview, it was found that suppliers were very reluctant towards the introduction of Project Angelo. Although the benefits and ease of use were explained, a statement was made that this was how Anglo American was going to conduct business in the near future. A grace period was said to be allowed before all transactions were going to be conducted using Quadrem. Suppliers' views were that they were then effectively forced to subscribe to the system to continue to do business with Namakwa Sands/ Anglo American. Especially to suppliers with no or little knowledge of e-procurement processes, this may seem daunting. 63% indicated that they did not have enough information to comment at all. 28% gave the indication that they will consider project Angelo as an option. No clear-cut opinions were however expressed.

- **Financial implication of e-procurement**
  With less than a quarter of the interviewees actively considering the implementation of an e-procurement solution and almost half not having prior knowledge of e-procurement it was difficult to obtain any answers. The majority indicated that they needed to investigate further before venturing any opinion. 28% indicated that their companies would be prepared to invest in e-procurement.

- **Internet usage**
  9% of the companies were actively using the internet to do business and therefore have a positive attitude towards it. 70% indicated that it has positive attributes, but do not utilise it in their offices. Lastly, 7% views it as purely an amusement tool.

- **E-procurement in general**
  After the information session, the interviewees seemed positive about e-procurement, but 67% indicated that they needed to investigate further.
23% of the suppliers interviewed stated that they are actively studying options of implementation and seemed enthusiastic about the idea.

- **Attitude towards Namakwa Sands**
  86% of the suppliers have a very positive attitude towards Namakwa Sands and indicate that they enjoy doing business with the company. 9% were neutral.

**End users**

The next step in the study was to analyse the questionnaires completed by the end users and ascertain their knowledge, infrastructure and attitude. The score sheets as well as the score sheet analysis can be found in Appendix F and G respectively.

**Knowledge**

- **Computer literacy**
  The end users seem fairly efficient (72.14%) regarding software and 61.43% when it concerns hardware. As far as the Internet is concerned, end users are 77.14% knowledgeable.

- **E-procurement**
  Several questions were asked regarding e-procurement and it seems in general as if there exists a lack of knowledge (45.96%), but this is not too low to rectify this deficit.

**Infrastructure**

- **Computer software/hardware**
  End users have the necessary equipment (65.71%) required at present to perform their duties. There is, however, an information technology (IT) department responsible for all software/hardware requirements.
• **Employee computer skills**
  At 77.86% it seems that the skills to perform present tasks are adequate, but this will not be at the same level when e-procurement is implemented at Namakwa Sands. This can be motivated as the knowledge of e-procurement is below average and thus could become a concern in the near future.

**Attitude**

• **Buy-in on Project Angelo**
  The end users seem very neutral (51.91%) when establishing buy-in on the project. This could be a result of a lack of knowledge and information.

• **Internet usage**
  As end users are computer literate and know how to use the Internet, the attitude towards it is neutral to positive.

• **E-procurement in general**
  The percentage established (38.58%) is very low. This negative attitude is also linked to the lack of e-procurement knowledge.

• **Materials Management department**
  47.86%, which is slightly negative, has been scored on average. This is mainly a result of the Materials Management department not being trusted to perform their duties adequately. Reasons could be a once-off bad experience or a constant performance just below average.

• **Suppliers**
  The end users’ attitude (51.43%) is slightly positive. This means that supplier performance is not bad, but also not exceptionally good.

**Materials Management department**

The abovementioned department was also analysed in terms of questionnaires sent out to staff in this department. The similar three focus areas were pursued,
namely knowledge, infrastructure and attitude. The score sheet and score sheet analysis can be found in Appendix H and I respectively.

Knowledge
- Computer literacy
  The literacy level indication from the questionnaire is adequate (72.50%) for present operations. This is also mirrored in the enjoyment level of using the Internet (76%).
- E-procurement
  The knowledge regarding e-procurement is a bit lower, but still higher than average (52%). This shall assist in the rollout of Project Angelo. It also means that minor or refresher training is required for most of the department’s employees.

Infrastructure
- Computer software/hardware
  As stated in the end users’ results it is adequate (89%) for present purposes. The IT department is responsible for this function and will therefore attend to concerns in this regard.
- Employee computer skills
  For the current position, the skills are sufficient (72.50%), but attention must be given when the move to e-procurement implementation is initiated.

Attitude
- Buy-in on Project Angelo
  This aspect received a rating of 56.00%. It therefore means that the department perceived this statement as fairly neutral. It is slightly positive, but not highly motivational. Care must therefore be taken to develop this attitude into a more positive one. An aspect that can be considered is e-procurement education.
• **Internet usage**
The attitude towards Internet is positive. This indicates that if the e-procurement skills are present, the shift to an Internet based environment would be welcomed.

• **E-procurement in general**
The grading for e-procurement in general is in the same range as the e-procurement knowledge (59.33%). This is moderately positive. It means that with some extra assistance this can become a highly positive aspect, which could then influence a highly positive attitude.

• **End users**
It is observed that the attitude towards the end users is neutral, but leaning a bit to the negative side (46%). This could be a result of the end users’ lack of understanding or perceived lack of understanding of the Materials Management function.

• **Suppliers**
It is interesting to note the positive (62%) attitude towards the suppliers. This is perceived to be directly related to the quality of the suppliers as well as the interaction with Materials Management department and the suppliers.

• **Materials Management department (Internal)**
This evaluation is slightly negative (43%). This is not due to a lack of enjoyment of working in this department, but it seems to be directly linked to the perception that this department is not regarded as a key function in the company.

In this section the perceptions, infrastructure and knowledge of the respective user groups have been established and analysed. Based on these results recommendations can be made as to the impact and implementation of e-procurement.
Recommendations

The impact of e-procurement on the respective user groups has at this stage been established by means of the interviews and questionnaires as well as the analyses thereof.

Firstly, it must be stated that the e-procurement implementation and rollout as well as any preparedness programs must be well planned and thought-through in all facets. Clear goals must be set, all users must be involved and progress must be documented and published. Communication channels must be good and open at all times.

It was noted in both the literature study as well as the results analyses that dire need exists to prepare the suppliers, company and customers for e-procurement. In this regard the following can be considered. When viewing the discussions on the supplier base, the company can realise that it can conduct preparedness programs by focussing on the top 200 suppliers. These suppliers were found to contribute to 91.32% of expenditure within the company. Thereafter the top 450 can be addressed, which provides a total expenditure of 97.77%. By focusing on these figures, Namakwa Sands can greatly minimise on the initial figures thought of to prepare when the total active supplier base was considered.

When considering the interpretation of the analyses, it may be advantageous to focus on the implementation of e-procurement at national and international level. These role-players are more prepared as far as infrastructure and knowledge are concerned and this most probably also explains their more positive attitude towards e-procurement. It is suggested that, as Namakwa Sands is very committed to community involvement and local development, it focuses an e-procurement awareness and education programme on its local suppliers. When
this program has been completed, a rollout of e-procurement on local level can be addresses.

The importance of training and education of all user groups cannot be over-emphasised. Firstly, it is clear from the results analyses that need exist for training of user groups. Secondly, each and every case study on successful implementation worldwide of e-procurement solutions accentuated the importance of training of all user groups, i.e. suppliers, end users, Material Management staff, management, etc.

Furthermore, a clear problem was identified in the stock to non-stock ratios. This concern can be successfully addressed when e-procurement is implemented as visibility of expenditure, use of suppliers and so forth is improved.

The implementation of e-procurement is set to impact greatly on all users involved with Namakwa Sands. It must therefore be realised that change management must be given priority. An action plan must be drafted in this regard to facilitate all user groups.

Lastly, it was reiterated in the literature study and echoed in the attitude concerns mentioned during the information session, that partnerships is of utmost importance in the implementation and rollout of e-procurement. All involved must buy-in and be committed to and involved in the project. It must always be kept in mind that the objective is not only to plan and effect e-procurement effectively in the user groups, but to establish sustainable development with business partners.

**Recommendations for future work/research**

The following can be considered when compiling a study with regards to e-procurement implementation:
• The draft of an encompassing supplier questionnaire that is sent out and followed up by the company’s expediting function may be ultimately time saving.

• Literature regarding disadvantages of e-procurement and case studies of failures in this regard may, although negative, prove useful to prevent re-occurrence. Limited sources could be found in this regard.

• Detailed programs as to change management when implementing e-procurement may be an asset and a topic of a complete study.

Conclusion

The objective of this dissertation was to assess the impact of e-procurement on Namakwa Sands. This was accomplished by focusing on three main areas, namely the impact of e-procurement on the respective end user groups, the preparedness of the company and the implementation of the rollout at the company.

An overview was given of e-procurement. It was supported by a thorough literature study on the subject. Practical as well as theoretical aspects were discussed. This was followed by an empirical study with the objective of establishing the potential impact of e-procurement on Namakwa Sands, its suppliers, end users as well as the Materials Management department. Two basic methods were utilised. Firstly interviews were conducted with suppliers to gain valuable first hand knowledge. Secondly questionnaires were distributed to the end users within the company as well as the Materials Management department. The basic focus areas of all procedures were to establish the knowledge of the respective end user groups, the infrastructure currently in place as well as the attitude of the group towards the e-procurement drive. The limitations of the chosen procedures were also mentioned to minimise biased results.
The results were then analysed and recommendations made to support the basic objectives of the study. It was emphasised that clear goals must be set for the e-procurement drive and that any rollout must be thoroughly planned. All parties concerned must be trained, educated and informed of the steps in the rollout. Lastly it was emphasised that an integral contributing factor to successful e-procurement implementation was to gain buy-in from all user groups. Change management therefore needs to be given priority within the organisation.

How this process looks and feels to the users is only the most tangible surface of a much deeper process of relationship and business strategies that must be deployed into goals and tactics to maintain your e-procurement initiative. As with many business transformations, success is an evolving goal, but it needn’t be an elusive goal. Initial investment in strategic aligned e-procurement creates value opportunities to reduce costs and improve profit margins. Especially in today’s economy, we see compelling evidence of the need for a company to grow, change and partner, breaking though a paradox of traditional thinking and creating value for the company and its micro and macro environment. As has been historically the case, emergent market winners and global players will be those organisations who made strategic investments to improve operating efficiency and long term relationships and partnerships.
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### Appendices

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<td>Appendix A</td>
<td>Profit Margin Calculations</td>
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<tr>
<td>Appendix B</td>
<td>Supplier Interview Guidelines</td>
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<td>Appendix C</td>
<td>End User Questionnaire</td>
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<td>End User Questionnaire Score Sheet</td>
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<td>End User Questionnaire Analysis</td>
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<td>Appendix H</td>
<td>Materials Management Questionnaire Score Sheet</td>
</tr>
<tr>
<td>Appendix I</td>
<td>Materials Management Questionnaire Analysis</td>
</tr>
</tbody>
</table>
Appendix A Profit Margin Calculations

New Purchases:

New Cost = Original Cost – Saving
New Cost = 50 – 50 x [5/100]
New Cost = 47.5%

New Profit:

New Profit = 100 – Other Costs – New Purchases
New Profit = 100 – 45 – 47.5
= 7.5%

Increase in Profit Margin:

Increase = \left[ \frac{\text{New Profit} - \text{Old Profit}}{\text{Old Profit}} \right] \times 100
= \left[ \frac{7.5 - 5}{5} \right] \times 100
= 50%
Appendix B Supplier Interview Guidelines

1. Supplier background

2. Knowledge
   - Computer hardware
   - Computer software
   - Internet
   - E-procurement
   - Namakwa Sands requirements

3. Infrastructure
   - Computer hardware and software
   - Employees' computer skills
   - Degree of automation relating to supply chain and materials management

4. Attitude
   - Buy-in on Project Angelo
   - Financial implications of e-procurement
   - Internet usage
   - E-procurement in general
   - Towards Namakwa Sands

5. Closing of interview
Appendix C End User Questionnaire

Please answer the following question by marking the response you agree with most. All questions must be answered.

The following rating applies:
Least agree 1
Most agree 5

Question 1:
I use e-mail at work.
1 2 3 4 5

Question 2:
The Materials Management Department at Namakwa Sands does a good job.
1 2 3 4 5

Question 3:
I don't use MIMS on a regular basis.
1 2 3 4 5

Question 4:
My supplies are delivered on time.
1 2 3 4 5

Question 5:
My PC is connected to the network.
1 2 3 4 5
Question 6:
I am not satisfied with the service rendered by suppliers at Namakwa Sands.

1 2 3 4 5

Question 7:
I know what e-procurement entails.

1 2 3 4 5

Question 8:
I can use the Internet.

1 2 3 4 5

Question 9:
I don't have all the computer hardware necessary to perform my daily tasks.

1 2 3 4 5

Question 10:
Namakwa Sands is geared for e-business.

1 2 3 4 5

Question 11:
My computer system is always functional.

1 2 3 4 5

Question 12:
I have no knowledge of Project Angelo.

1 2 3 4 5
Question 13:
I trust Materials Management to provide the goods and services I require.

1  2  3  4  5

Question 14:
E-procurement will not positively impact on a company’s profit margin.

1  2  3  4  5

Question 15:
I don’t have all the software on my PC that I require to perform my daily duties.

1  2  3  4  5

Question 16:
I believe project Angelo will work.

1  2  3  4  5

Question 17:
Project Angelo will save Namakwa Sands money.

1  2  3  4  5
Appendix D Materials Management Questionnaire

Please answer the following question by marking the response you agree with most. All questions must be answered.

The following rating applies:
Least agree  1
Most agree   5

Question 1:
Namakwa Sands suppliers are of a good quality.
1  2  3  4  5

Question 2:
I have no knowledge of project Angelo.
1  2  3  4  5

Question 3:
I am connected to the Internet.
1  2  3  4  5

Question 4:
E-procurement is the way to do business.
1  2  3  4  5

Question 5:
I enjoy working in the Materials Management Department.
1  2  3  4  5
Question 6:
I don't have the necessary software on my PC to perform my daily tasks.

1  2  3  4  5

Question 7:
I enjoy interaction with the end users.

1  2  3  4  5

Question 8:
E-procurement is going to increase my workload.

1  2  3  4  5

Question 9:
The Materials Management Department is not regarded as a key function at Namakwa Sands.

1  2  3  4  5

Question 10:
Suppliers cooperate with Namakwa Sands Materials Management.

1  2  3  4  5

Question 11:
My computer system is not always operational.

1  2  3  4  5

Question 12:
Project Angelo will be successful.

1  2  3  4  5
Question 13:
End users understand what the function of Materials Management is.

1 2 3 4 5

Question 14:
I don't know what e-procurement entails.

1 2 3 4 5

Question 15:
Our current materials Management practice is better than using e-procurement.

1 2 3 4 5

Question 16:
I like to use the Internet.

1 2 3 4 5
Appendix E Individual Expenditure Per Region

Top 10 - Distribution of total expenditure

Top 20 - Distribution of total expenditure

Top 50 - Distribution of total expenditure

Top 100 - Distribution of total expenditure

Top 200 - Distribution of total expenditure

Top 450 - Distribution of total expenditure

74
### Appendix F End User Questionnaire Score Sheet

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<th>Knowledge</th>
<th>Average %</th>
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### Appendix G  End User Questionnaire Analysis

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## Appendix I Materials Management Questionnaire Analysis

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