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# Optimizing procurement through process automation

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**Abstract**

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The purpose of this thesis was to research how to optimize procurement through process automation. This thesis aims to examine the current procurement process of a case company, identify challenges and propose an improvement strategy that would increase the efficiency of procurement activities.

The theoretical framework of this research is based on two main topics: procurement, which covers the levels of procurement, e-procurement, and provides an overview of the subject. The second part, economic value added (EVA), which describes how the impact of e-procurement can be measured.

The research method applied in this thesis was a qualitative case study. Both primary and secondary data were used in this study. The primary data consist of direct observation and personal experiences of the author during an internship period in the case company. A qualitative interview was also conducted with a procurement representative of the case company.

In conclusion, after the analysis of the current procurement process of the case company, this thesis suggests that the implementation of an e-procurement strategy into the procurement process of the case company will significantly improve efficiency in the process and eliminate the challenges by automating some procurement activities.

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| Keywords | Procurement process, E-procurement, Optimization, SAP |

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# 1 Introduction

Procurement is one of the most important functions of an organization because of its impact on business operations and overall organizational success. In recent years, this particular aspect of a corporate service has gained focus because it is at the intake area of the supply chain where over 60% of the organization's resources are used to support the business operations (Presutti 2003). For this reason, it is very crucial to find ways to optimize the procurement process for maximum efficiency.

Recognizing the significance of procurement in an organization, it is surprising to see that many business enterprises operate without taking full advantage of having an effective procurement process - especially nowadays, where the way we do business has been completely transformed due to technological advancement. The competition is high more than ever, and we must find ways to improve. One of the means of optimizing the procurement process is through e-procurement, this is the area of focus of this research.

The concept of e-procurement has increasingly become vital in the supply chain. It refers to the use of the internet to communicate and perform business transactions between buyers and sellers. "This technological solution has transformed the way purchasing processes are carried out, allowing improvements in terms of efficiency and quality in the management of physical, information and financial flow" (Piera, Roberto, Giuseppe & Teresa 2014). E-procurement system can be seen as the integration between inter-organization, automating business processes like requesting, order management, purchase approval and accounting processes through internet-based protocols (Rodriguez, Labra & Ordonez 2014). It has also changed the structure of relationships between the stakeholders in the supply chain.

## 1.1 Case company background

The case company used in this research is in the e-commerce industry. This research aims to analyze its procurement process and find ways to optimize it, to achieve maximum efficiency.

Due to confidentiality reasons, the name of the case company will be anonymous and will be referred to in this research as company X.

Company X is the leading online marketplace in Africa that offers easy online and mobile shopping, travel, classified and services platforms. Company X is the parent of a group of nine companies in more than 14 African countries. The company's objective is to deliver comfortable, innovative and inexpensive online goods and services to customers using the power of technology. The company was founded in 2012, and its headquarter is located in Nigeria. The company extended it market presence in other countries, kenya, South Africa, Ivory Coast, Egypt, Morocco and Ivory Coast. In March 2019, the company launched its IPO and listed its shares on the New York Stock Exchange (NYSE) market. Today, the company has a presence in more than 14 African countries (company X 2019).

## 1.2 Current procurement process of the case company

As mentioned earlier, Company X is a parent of a group of nine companies in 14 countries, and each of these companies handles their procurement separately. The procurement process in the case company is very traditional, where every activity in the procurement cycle is done manually, including small and repetitive tasks. Some of these tasks are writing Request for Quotation (RFQ), approvals, negotiations, discussing bids etc. The most time-consuming activity in the procurement cycle is approval which usually takes between 3 - 9 days. Managing the procurement process requires enough staff up to about eight people with lots of paperwork involved. Thus, it is time-consuming and expensive.

The company's procurement department use google drive database system to store all procurement information such as purchase and payment data. Supplier data are also stored on a google drive-based excel sheet. All purchase information is recorded on a google sheet and is updated several times manually daily. This makes the work tedious and prone to error.

The author of this research worked in the procurement department of this case company and has observed that some of the main challenges in the operations of the department are manual data recording and long approval process. The author proposed that a key way to overcome these challenges is to automate the procurement process using an e-procurement solution. By implementing an e-procurement solution, the company will save a lot of time

and scrap some lengthy repetitive processes associated with approvals and negotiations and replace them with automated processes. Thus, research on adopting an e-procurement system is needed.

## 1.3 Research objectives

An effective procurement strategy can increase a company's profitability by reducing purchasing cost. Studies have shown that a 5% reduction in the purchasing cost of a typical company can improve up to a 30% increase in its sales. A common challenge many CPOs and other purchasing leaders often face when securing funds to invest in e-procurement solutions is that they need to present clear evidence of impact and a measurable return on investment (spendmatter.com).

This research aims to highlight some cost-saving areas in the procurement process of the case company through the implementation of an e-procurement system. This research analyzed the current procurement process of the case company and identified some challenges in its procurement process. The purpose of this research is to recommend an improvement strategy for the case company through the implementation of an e-procurement solution. The goal of this research is to provide adequate information and recommendations to improve the current procurement process of the case company.
Furthermore, there are many e-procurement applications available on the market, and it can be difficult for organizations to choose which is most suitable for their businesses. This research will select a reputable business software solution provider and highlights some of its e-procurement features and value offer, to help the company make an informed decision when adopting e-procurement solutions.

## 1.4 Research question

This thesis aims to help the company improve its procurement process by implementing an e-procurement strategy. This is done by providing relevant information about the benefits and risks associated with e-procurement solution. The strategy and implementation impact will also be studied. Finally, a selected e-procurement solution and its features will be analyzed, and a recommendation will be made to the case company.

The major research question of this thesis is "how does implementing an e-procurement solution improve the current procurement process and provide a measurable value-added to the company?"

The research question is further divided into further investigative questions which state as follows;

1. What are the challenges in the procurement process of the case company and how does e-procurement combat these challenges?

Primary data is collected for this research question through discussion with management, procurement staff of the case company, personal working experience and observations during an internship at the case company.

2. What is the value offer of the chosen e-procurement software provider?

Primary data and secondary data will also be collected for this question from an e-procurement vendor through discussion and emails.

3. What are the recommendations for the case company?

The data for this question will be collected from the analysis of the two previous questions.

## 1.5 Definition of the main subject of research

The main purpose of this research is to optimize the procurement process of company X, therefore, defining the main topic is essential.

There are many definitions of procurement, but they ultimately have the same idea. Procurement is defined as "the systematic process of deciding what, when, and how many to purchase; the act of purchasing it; and the process of ensuring that what is required is received on time in the quantity and quality specified" (Baily, Farmer, Crocker, Jessop & Jones 2008, 37).

Procurement is often used interchangeably with purchasing, but the fact is that purchasing is just a part of a much broader procurement process. Van Weele also agrees that procurement is a wider term. He refers to "procurement as all activities required in order to get the product from the supplier to its destination" (2010,10). These activities comprise of purchasing functions, transportation and quality control. According to him, the procurement function is based on the Total Cost of Ownership (TCO) rather than just price. Figure 1

below illustrates the scope of purchasing and procurement functions.

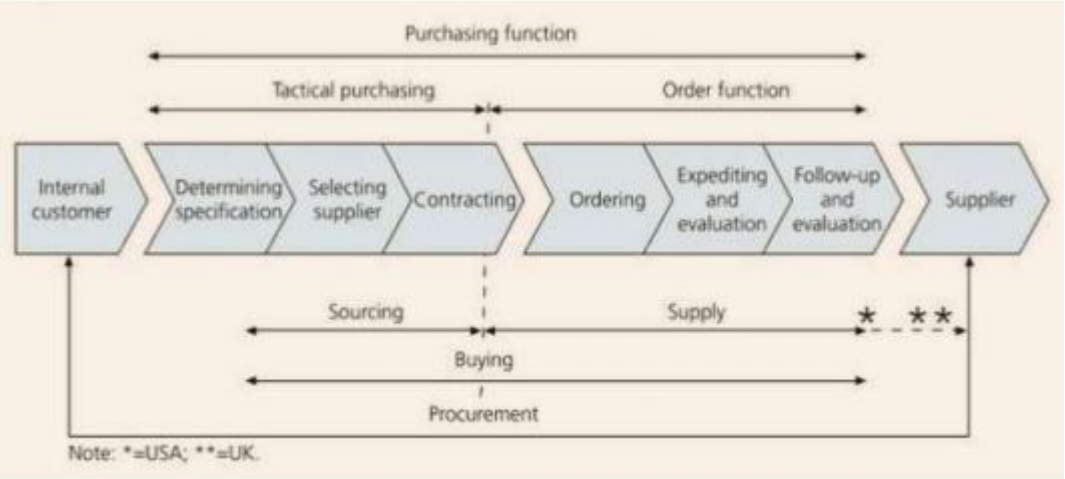


Figure 1: Scope of Purchasing and Procurement (Van Weele 2010, 9).

The national procurement strategy for local government cited in (Lysons & Farrington 2012, 6), defined procurement as "a process of acquiring goods, works and services, covering both acquisitions from third parties and from in-house providers. The process spans the whole lifecycle from the identification of needs, through to the end of the useful life of an asset. It involves options appraisal and the critical 'make or buy' decision". Also, Lysons and Farrington (2012, 6) agree that procurement is broader than purchasing.

Now that the distinction between procurement and purchasing has been established, it is equally important to provide the definition of purchasing.

The classical approach of defining purchasing found in Lysons and Farrington (2012, 6) states that "it refers to the process of buying materials of the right quality, in the right quantity from the right source delivered to the right place at the right time at the right price". However, this definition has been widely criticized. It was argued that the definition portrays a limited view of the concept of purchasing. It implies that purchasing is 'reactive rather than proactive' - this means that purchasing activities are based on instructions rather than using one's initiative to assist in the formulation of purchasing policies. The definition also suggest purchasing is 'transactional rather than relational' - that is, it principally involves placing a one-time order rather than building a long-lasting and mutual supplier relationship. Finally, according to Lysons & Farrington (2012, 6) the definition was criticized that

purchasing is 'tactical rather than strategic' - which means it concentrates on short-term buying rather than achieving long-term corporate goals.

A much more recent definition of purchasing from Winthrop University extracted from Lysons and Farrington (2012, 6) states that "Purchasing is the process of procuring the proper requirement, at the time needed, for the lowest possible cost from a reliable source".

## 1.6. Structure of the thesis

This thesis is structured into five chapters. The first chapter consists of an introduction of the topic subject, objective of the research, the research question, and the definition of the main subject area. The purpose of this part is to give the reader a background of the topic and the case study.

In the second chapter, an extensive literature review is provided for the reader to understand the relevant theories and terms associated with the topic. This chapter consists of the definitions of procurement, procurement processes and levels of procurement. It also includes e-procurement, the benefits and risks associated with e-procurement and the implementation process are discussed. This chapter is applied in the empirical study of this thesis.

The third chapter describes the research methodology used in this thesis and the method of data collection. The qualitative research method was adopted when carrying out this research. Primary data was collected through direct observation method and interviews, while secondary data were collected from books, journals, websites.

In the fourth chapter, the current procurement process of the case company is analyzed, using data collected through direct observation and a qualitative interview. The answers to the research questions are also presented in this chapter.

The final chapter draws a conclusion based on the analysis and research results from the previous chapters and gives recommendations to the case company.

# 2 Literature review

The theory selection for this literature review is targeted to give the readers a background understanding of procurement activities in an organization. This review explains the role of procurement in the value chain, the types of procurement, and the procurement process management.

Additionally, e-procurement suggested in this research as a way of optimizing the procurement function of an organization was elaborated on in this literature review. The benefits and risks that organizations should be aware of before adopting an e-procurement solution are discussed.

## 2.1 The role of procurement in the supply chain

Procurement is a strategic function of an organization and therefore contributes significantly to the success of a company. According to the Supply Chain Resource Cooperative (2011), an essential role of procurement in an organization's value chain is to understand the business requirements and determine important materials and services which help the company's strategies in key performance areas. The function of procurement is to develop supply alternatives and emergency plans that support the organization. Porter (1985, 39) classified procurement as a support activity in the value chain. He argued that procurement provides support to the primary and other support activities in the value chain of an organization by purchasing the inputs used in the firm's value chain which may include raw materials, supplies, consumables and assets such as machinery etc. This purchased inputs may be related to primary activities like logistics, operations and marketing, as well as other support activities like HR and Technology development. Consequently, this illustrates the importance of procurement role in relation to other departmental functions in improving the value proposition of an organization to its final customers.

### 2.1.1 Function of procurement

Procurement has a very important function in an organization. An effective procurement process with a defined policy and framework in the decision-making process can considerably boost sales margin by realizing substantial savings in cost.

### 2.1.2 Types of Procurement

The initial procurement decision of a company has to make is whether to produce or to buy materials needed for its business operations, hence the term 'make-or-buy-decision'. The company also has the option to outsource its procurement function, allowing it to concentrate on its core competencies. Below are the basic types of procurement;

1. Single procurement: the supplier's process of production is triggered by initiating specific customer order (Heiserich et al., 2011).
2. Stock procurement: This type of procurement means goods are restocked periodically without any specific customer order. This is achieved by setting a minimum stock level. A minimum number of stock must be available after completion of production before the next order from a customer. If the stock level drops below this defined threshold, it initiates the procurement process. The advantage here is that demand can be forecasted and this type of procurement allows flexibility. However, it can be quite expensive (Heiserich et al., 2011).
3. Vendor Managed Inventory (VMI): in the VMI-concept, the supplier is in charge of replenishing stock at the customer's company. The close network between customer and supplier allows efficient processes, high flexibility and lower costs (Arnold, 2009).
4. Just-in-time procurement: The supply of goods in this type of procurement is based on low stock levels. Just-in-time procurement is successful when the supplier has a close network with the customer. This is very helpful because it allows cost reduction, lean and balanced processes.
5. Just-in-sequence procurement: This is a successive supply of goods in a prescribed order at a defined time. This type of procurement is very efficient and lean.
6. Ship-to-line: The procurement requires very few logistical steps. The goods are dispatched from the supplier's last value-added location to a location where the customer begins to add value (Heiserich et al., 2011).

### 2.1.3 Methods of Procurement

It is the responsibility of the procurement department to make available goods and services for the daily operations of a business or company. This responsibility may include sourcing

for materials at competitive prices, contracting with suppliers, budgeting and analyzing trends to make sure that the firm's resources are spent wisely.

The right quality product at a reasonable price doesn't necessarily guarantee approval for a new supplier. The procurement analyst in a company applies a range of methods before choosing a new source of supply. There are mainly six procurement methods, and their names vary depending on the industry, they include;

1. Open Tendering

This is alternatively known as competitive bidding. Vendors bid on goods in open competition. When using an open tendering method, the company must;

- Advertise locally or reach out to required vendors.
- Provide impartial and logical technical specifications.
- Set objective assessment measures.
- Consider all qualified vendors.

Arguably, the effective competition encouraged in this method of procurement lays emphasis on price. However, this method is unsuitable for complex procurement because of its procedure-based nature. It concentrates on the output process rather than stringent obedience to standards (Sponaugle 2014).

2. Restricted Tendering

This method is comparable to open tender. The only dissimilarity is that restrictive tendering sets a limit on the number of suppliers that can bid. Restrictive tendering methods can also be called selective tendering because of its selective process. Similar open tendering, restricted tendering is also a competitive method but, the competition is limited to the suppliers that are invited by the company that is procuring the materials. To ensure an effective selection process, the company procuring the materials should establish ground rules when choosing suppliers. The advantage of this method is that it saves time and money in the selection process, and ensures that goods and services are purchased from the most qualified supplier (Sponaugle 2014).

3. Request for Proposals (RFP)

A proposal is a unique document explaining the reasons why a particular business is the right fit for a project. A Request for Proposal method is used by suppliers or service providers to propose their goods or services for review to the procurement team of a company. Having a good understanding of quality service management is vital to winning a bid. Suppliers writing an RFP must also include a quotation proposal so that the RFP can be reviewed thoroughly with its financial component by the procuring company. It is very important to prioritize the quality of a proposal over price when selecting a supplier or service provider (Sponaugle 2014).

4. Two-Stage Tendering

In this method of procurement, there are two processes involved, and each process has two stages. This method is very flexible because it allows room for discussion so that both parties to meet mutual agreements. However, it can be inconvenient for the procurement team if there is a limited time.

The first process in this procurement method is similar to the RFP method. This process requires suppliers to present a technical proposal. The proposal is based on fulfilling the requirements set by the procurement department. The highest scored bid is invited for further discussion in order to reach an agreement. Once the technical proposal is approved, the supplier presents a financial estimate before further discussions on contract negotiations.

In the second process, a partial technical proposal is provided at first to allow modifications and discussion. Once the highest qualified supplier is chosen, they will be invited to present a comprehensive technical specification, including the financial estimate. The bidder is chosen based on the overall score of both financial and technical proposals (Sponaugle 2014).

5. Request for Quotation [RFQ]

This is the simplest method of procurement. The process of RFQ is fast, and less paperwork is required. It is used for low-cost goods or services, and the parties involved this method has no formal proposal drafted. Usually, the procuring team chooses a minimum of three preferred vendors, they analyze their quotes and the most qualified vendor is selected (Sponaugle 2014).

6. Single-Source

This procurement method is a non-competitive. It is used when a company decides to procure goods or services from an exclusive provider. This method is commonly used in case of emergencies, or when the requirements can only be fulfilled by only one supplier (Sponaugle 2014).

Conclusively, the success of any of the procurement methods can be attributed to the effort invested and the acquired goods or services. Each of the mentioned procurement methods should follow a strict legal framework to ensure compliance with standards and quality in the selection process.

## 2.2 E-procurement

### 2.2.1 Definitions of e-procurement

Electronic procurement (EP) has been defined in various ways. A popular definition by Van Weele (1994) states "E-procurement includes web technology-based purchasing solution aimed at simplifying commercial transactions within and between organizations and informational technology solutions for ordering, logistics and handling systems as well as for payment systems" cited in (Sitar 2011). B Another definition of EP by de Boer, Harink and Heijboer (2002), quoted by Piera, Roberto, Giuseppe, and Teresa (2014) states that "its the use of the internet in the purchasing process". Similarly, Presutti (2003, 221) defines e-Procurement as "a technological solution that facilitates corporate buying using the internet".

The Chartered Institute of Procurement and Supply (CIPS), defined e-procurement as "using the internet to operate the transactional aspects of requisitioning, authorizing ordering, receiving and paying processes for the required services or product".

However, the concept of e-procurement can be easily confused with e-sourcing. Baily, Farmer, Crocker, Jossep & Jones shows us that "one of the critical goals of e-procurement is to devolve buying to local users and covers the requisition against a contract, authorization, order, receipt, and payment" (2008, 394). E-sourcing, on the other hand, as defined by CIPS, is "using the internet to make decisions and form strategies regarding how and where services or products are obtained".

### 2.2.2 Relevance of e-procurement

E-procurement is crucial in effective supply chain management, and many managers have realized this. The internet phenomenon has made this concept a powerful tool for organizations to improve the competitiveness of their firms. "Managers are now becoming increasingly aware of the power of effective procurement where more than 60% of the firm's sales revenue is spent to support the business operations" (Presutti 2003). This factor has brought e-procurement to the centre of attention as a critical improvement in supply chain management.

"The impact of internet technology on what has been traditionally called the purchasing process has been pervasive. It starts from how suppliers and the internal members of the firm's buying team get involved with the specification development of the process to the systematic collection of data to completely and objectively evaluate supplier performance" (Presutti 2003). The adoption of this technology involves organizational change and reengineering of process. As Piera, Roberto, Giuseppe, and Teresa state: "The traditional model of acquisition is changed, going from centralized to decentralized and this leads to a fundamental change in the role of employees in the purchasing" (2014). This change will require management to reevaluate the relationship between suppliers and customers, and develop new policy that helps manage this relationship.

E-procurement changes the focus from downstream to upstream activities in the supply chain. It allows the firms to perform all the procurement process online, so they can purchase different types of raw-materials or services using e-procurement solutions. These solutions enable companies to reduce material cost, procurement cycle time and help identify better sources of supply. Procurement is viewed as a strategic function of an organization; therefore, it needs to be approached in a strategic way using the appropriate e-procurement tools.

### 2.2.3 Benefits of e-procurement

This section highlights the benefits associated with the adoption of an e-procurement solution. These benefits are expected to accelerate the adoption of e-procurement and encourage significant resource commitment.

The benefits of e-procurement are enormous, and many organizations recognize these. Davila, Gupta and Palmer (2003, 17) contend that companies that use e-procurement technologies report savings of 42 per cent reduction in purchasing transaction cost. This cost reduction can be linked with less paperwork which results in less error, reduced labour costs, and more efficiency in the purchasing process. E-procurement enables a streamlined purchasing process, which in turn significantly impact the purchasing cycle time. Faster cycle time increases flexibility and provides more up-to-date information when placing a purchase order. It also means that the procurement specialist has more freed up time to focus on strategic tasks like supplier relationship management. A study by Davila et al. quoted in an article by Sitar (2011) ranked the first six benefits of implementing e-procurement as: "reduced purchasing transaction cost, purchasing order fulfilment time, increased number of suppliers, reduced purchasing cycle time, the price paid for goods decrease and headcount to support purchase transaction".

The main benefits of e-procurement can also be classified into three categories (Sitar 2011):

- Management
    - Information management across all areas of purchasing is improved
    - The management has considerable influence and control over the purchasing process
    - The opportunity to oversee the entire supply base is significant

- The operational purchasing
    - Time-saving
    - Cost-saving
    - Reduced inventory level and cost

- Suppliers
    - Improved relationship with the buyer
    - Cost and time saving
    - Reduction in paperwork and duplicated records
    - Bills are paid on time and more quickly.

Figure 2 below illustrates the impacts and KPIs of e-procurement technologies. By implementing e-procurement, companies can realize a significant cost savings throughout the entire procurement process.

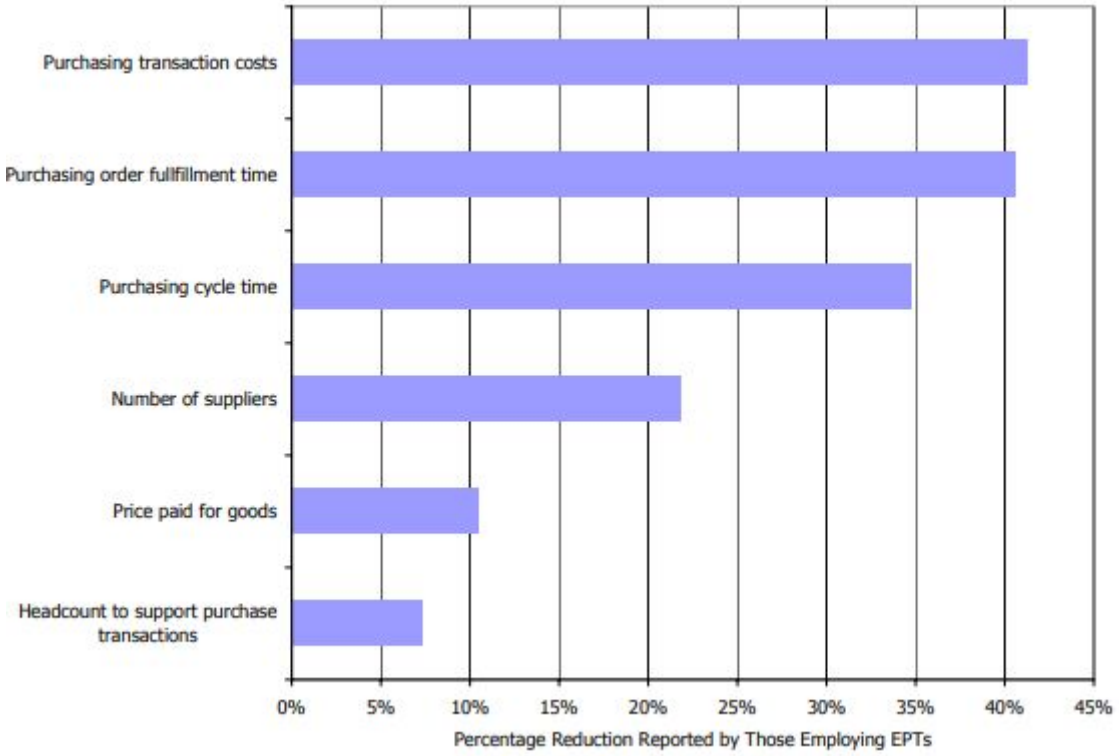


Figure 2. Efficiencies generated from the adoption of e-procurement technologies (Davila, Gupta & Palmer 2003).

As Persutti (2003) writes: "e-procurement systems enable firms to more efficiently and accurately capture and aggregate how much they are spending the corporate revenue in various purchased product areas, allowing them to bring their purchasing power leverage to the market". A research by Aberdeen Group (2001) concludes that the benefits of an e-procurement strategy estimates a reduction of about 5-20% in material cost, 25-30% in the sourcing cycle times and 10-15% in time-to-market. Reducing those cycle time will significantly increase the firm's revenue generation potential as products are delivered faster to the market. This allows the firm to secure the market share of the first-to-market position.

### 2.2.4 E-procurement related risks

Although e-procurement systems have high potentials and benefits, its adoption also comes risks and challenges. Organizations should be aware of these risks and find ways to mitigate them before implementing e-procurement. Some common problems of e-procurement found in many pieces researches include expensive implementation cost, limited resources, and supplier resistance.

According to Sitar (2011), Hawkins conducted a research on the barriers of e-procurement in Australia. He then ranked the barriers in order of importance as follows; "inadequate technical infrastructure, lack of skilled personnel, the inadequate technological infrastructure of business partners, implementation cost, company culture" to mention a few.

Davila, Gupta & Palmer (2003, 19) also explored the risks in adopting an e-procurement technology, and they identified them in four categories as follows:

- Internal business risks

The implementation of an e-procurement solution does not only require a successful electronification of the procurement process but most importantly, that the system integrates with the existing information infrastructure. Such infrastructure includes logistics system, inventory management, human capital, production planning, and asset management systems. Most organizations are already heavily invested in these systems and this should allow a smooth integration with existing platforms. Failure to integrate will create a repetitive work step and jeopardize the reliability of organizational information (Davila, Gupta & Palmer 2003, 19).

- External business risks

Davila, Gupta & Palmer (2003, 19) argues that while e-procurement technology must integrate with the existing internal information infrastructure, it must also communicate with external stakeholders, namely suppliers and customers. These external stakeholders need to develop their internal systems to facilitate this communication. To ensure successful implementation of e-procurement, suppliers will be required to invest in technology to conduct business on the internet. They will also need to provide an e-catalogue as specified by the customer. It may become a challenge for small enterprise and companies with low margin, as they may be unable to meet such demand without guarantee of a future revenue stream. "Lack of a critical mass of suppliers accessible through the organization's

e-procurement system would limit the network effects that underlie these technologies, further hindering the acceptance and adoption of the technology"(Davila, Gupta & Palmer 2003, 19). For new suppliers to join the supply network, they will also be required to meet the organization's business criteria. This means companies using e-procurement system must develop mechanisms to ensure that new suppliers meet industry standards regarding quality service and delivery capacity.

- Technological risks

Davila, Gupta & Palmer findings indicate that the absence of a generally accepted standards and easy comprehension of which e-procurement technology that best suit the needs of each company will create fear of adoption. Consequently preventing the integration of different e-procurement solutions across the supply chain (2003, 19). The risk suggest that e-procurement technologies should have simple and generally accepted standards that would facilitate integration between organizations using different e-procurement solutions. "Without a widely accepted standard for coding, technical, and process specification, e-procurement will fail to deliver the benefits as expected" (Davila, Gupta & Palmer 2003, 19).

- Process risks

This concerns risks of unauthorized control and security in the e-procurement process. When committing to e-procurement technologies, it is very essential that organizations avoid situations that would allow unauthorized actions to disrupt production and other supply chain activities (Davila, Gupta & Palmer 2003, 19).

Organizations must be aware of these risks and challenges, and also identify ways to mitigate them. They should also carefully identify the impacts of e-procurement technologies before implementing the systems. Non-users of e-procurement should be aware that adopting these technologies does not undercut security, privacy and control. Companies with a limited skill set can also use these technologies.

## 2.3 Economic Value Added (EVA)

This is an excellent tool used in measuring the benefits that e-procurement has contributed to an organization's profitability. Stern Stewart and company, a New York consulting firm

developed EVA and defined it as "a comprehensive measure of profitability than traditional measures because it indicates how well a company has performed in relation to the amount of capital employed" (Prober 2000). EVA is expressed as;

EVA = operating profit after-tax - the cost of capital.

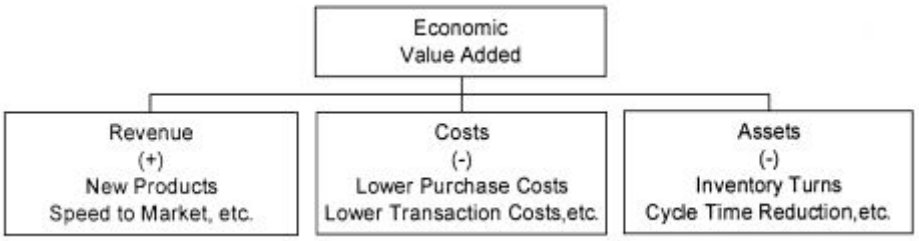


Figure 3. The impact of supply management on economic value added (EVA). Adapted from Presutti (2003).

EVA's advantage over other means of measuring a company's financial performance is that it identifies the activities that help bring about value creation. Figure 3 above categorized those activities as revenue, costs, and assets. When the management is aware of EVA major drivers, it increases their appreciation of the impact of innovation, cost reduction, technological improvements and efforts to reduce the capital base on value creation (Presutti 2003).

Ray (2001) contends that firms have control over activities that can create value and improve profitability, thus, effective management should improve revenue, asset turnover and reduce cost. However, the firm's control is limited when it comes to the cost of capital element of EVA because outside forces largely determine it. It is essential that firms realize that increased productivity will increase its return on capital, therefore boosting EVA. Productivity can be improved in three ways; (1) increasing output while input remain the same; (2) reduce cost of inputs while output stays at the same level; and (3) reduce inputs and increase output.

The linkage between productivity and EVA is visible in whichever path is chosen to increase productivity. And as Ray (2001) concludes, "the firm will find that value is being created whenever productivity has pushed the firm's return on capital past the cost of capital".

### 2.3.1 Measuring the impact of e-procurement with EVA

An important reason to understand EVA as a key financial measure for e-procurement is because of its inescapable impact on the value-creating elements of revenue generation and cost and asset base reduction. "The overall effect of positively affecting revenue while reducing input costs and the asset base is to drive the firm's productivity higher" (Presutti 2003).

- Impact on revenue

As previously mentioned, one of e-procurement benefits in a study conducted by Aberdeen group (2001) is time-to-market cycle reduction of about 10-15%. As Presutti (2003) shows us, "a significant reduction in the time-to-market cycle is important for a successful revenue-boosting product launch". This is not only limited to a new product. When a supplier has the ability to get its existing products faster to the market, it allows its customers to keep lower inventory levels. As a result, the customer's value creation initiatives are positively affected allowing them to operate with a lower asset base (Presutti 2003). Reducing time-to-market gives the supplier a competitive advantage which can help boost its revenue through more market share.

- Impact on cost

Adopting e-procurement can result in a dramatic reduction in material and transaction cost. According to Presutti (2003), the cost of materials can be reduced between 5%-20% while transaction cost reduction can be more significant up to 65%. There is a clear effect on EVA. The operating profit element of EVA is significantly boosted as a result of those cost reductions. Furthermore, one may argue that materials cost also have revenue-boosting implications, so that material cost reductions impacts both the cost and revenue element of EVA. Often, the primary concern of corporate executive is that in a no-growth economic environment, a topline revenue increase may not always be possible (Presutti 2003). In this situation, Presutti (2003) concludes that "the cost component substantially impacted by an e-procurement strategy, may be the key to continued value creation in that circumstance".

- Impact on asset

Presutti (2003) contends that in a firm's asset base, the inventory component is usually very significant. It accounts for as much as 30% of a firm's invested capital. Furthermore, the

firm's profitability can be directly boosted as a result of the reduction in cost derived from a decrease in the inventory component of the asset base. In addition, Presutti (2003) suggests that a significant amount of cash is made available from these savings can be used for more valuable purposes such as investing in capital equipment or continued improvement in e-procurement technology.

# 3 Research Methodology

A research methodology is defined to resolve a research problem systematically. It involves various stages that are commonly used in studying a research problem. "Researchers should understand the implications of using a method or technique and its relevance to the research study. Hence, the results are capable of being evaluated either by the researcher or by others" (Kothari 2004). In business, there are three types of research, they are; exploratory research, descriptive research and causal research (Sachdeva 2008, 14).

## 3.1 Exploratory research

This thesis work explores the procurement process of the case company to define the problems in the current process and suggests ways for improvement.

According to Sachdeva (2008, 14), gathering preliminary information that will help define the problem and recommend hypotheses is the main focus of an exploratory research. He argued that when an issue has not been clearly specified, an exploratory research is conducted. It assists in determining the most appropriate research design, method of data collection and subjects selection. Sachdeva points out that "an exploratory study relies on secondary research such as reviewing available literature and data, or qualitative approaches such as informal discussions with consumers, employees, and more formal methods through in-depth interviews, focus groups, case studies" (2008, 14). Furthermore, he claims that the results of exploratory research are not usually useful for decision-making by themselves, but they can give meaningful insight into a given situation (Sachdeva 2008, 14). Different technique may be used to achieve the objective of exploratory research. Either quantitative or qualitative techniques are suitable, however, qualitative technique is best suited. Thus, a qualitative method was used in this research.

## 3.2 Qualitative research in a case study

Sachdeva (2008, 177) defined a case study as, "a research strategy, an empirical inquiry that investigates a phenomenon within its real-life context". A case studies can either be single or multiple, which may include the combination of both quantitative and qualitative evidence. Researchers gather data from many sources like flyers, company reports, journals, and tabloids and newsletter articles, including direct observation, and join them with interview

data from participants. "The objective is to obtain multiple perspectives of a single organization, situation, event and process at a point in time or over a period" (Sachdeva 2008, 177).

In a qualitative research, the data collection method concentrates on gathering data through open-ended and conversational communication. According to Kothari (2004, 3), "this type of research aims at discovering the underlying motives and desires, using in-depth interviews for the purpose". A qualitative research approach method and data collection through interviews and direct observation method was used in this thesis work. This method is most suitable since this research focuses on a transition from an offline procurement to an e-procurement process, and the most accurate information about the processes lies within the case company.

## 3.3 Data collection method.

When deciding the method of collecting data for a research, there are generally two sources of data to consider; primary and secondary data.

Primary data are original information collected for the first time during the research process. The researcher collects this data through various means such as surveys, direct observation, interviews, questionnaire, including experiments. Primary data is reliable because the researcher will know the origin of the data, how it was gathered and analyzed. However, secondary data are edited primary data i.e. second-hand version. They are data collected by other people for a different purpose. There is an overwhelming amount of secondary data and it is essential that researchers find data that is relevant to their study. As Sachdeva (2008, 109) pointed out, "secondary sources take the role of analyzing, explaining, and combining the information from the primary source with additional information". Secondary data can be collected from external sources such as the internet, published data, and internal sources such as financial information, sales data, etc.

In this research, both primary data and secondary data were collected. The primary data was collected through a method of direct observation in the case company and interviews from both the case company's employee and the e-procurement vendor. The secondary data used in the literature review was collected from external sources (internet, published data) and internal sources (product description) from the e-procurement vendor.

### 3.3.1 Method of direct observation.

Sachdeva (2008, 180) contends that "observation is a scientific inquiry when it is conducted specifically to answer a research question. It is systematically planned and executed, uses proper controls, and provides reliable and valid account of what happened". Data collection through a method of observation essentially require a methodical observation, documentation, description, analysis and interpretation of people's behavior.

According to Saunders, Lewis and Thornhill (2012, 342-355), there are two types of observation; Participation observation is qualitative, and it emphasizes on discovering the meanings that people attach to their work. In this type of observation, the researcher is present in the investigated environment, physically observing the subject of the research. In contrast is a structured observation, which is concerned with the frequency of action (Saunders, Lewis & Thornhill 2012, 342-355). In the case of this thesis work, the author was an intern in the procurement department of the company X, hence, participation observation was used.

### 3.3.2 Interview

In qualitative methodologies, an interview is a method of collecting primary data. "Interview varies based on the number of people involved during the interview, the level of structure: the proximity of the interviewer to the participant, and the number of interviews conducted during the research" (Sachdeva 2008, 167). This method can be performed individually or in a group, and if possible, through telephone interviews.

Individual interviews comprise three types (Sachdeva 2008);

1. Structured
2. Semi-structured
3. Unstructured interview

According to Kothari (2004, 97), "a structured interview involves the use of a set of predetermined questions and of highly standardized techniques of recording". The interviewer adhere to a set of prescribed procedure, asking questions in a manner and order prescribed. This type of interview has very little flexibility. To achieve the major objective, the interviewer remain neutral to collect commensurate information from a potentially large number of subjects. On the other hand, semi-structured and unstructured interviews are

distinguished by increasing flexibility in their manner of questioning. A semi-structured interview normally begin with some set of questions and then allow the interviewer some flexibility and creativity. In an unstructured interview, Sachdeva (2008, 175) claims that there are no predetermined questions or structure of topics to be discussed and each interview is tailored to each participant. In this thesis work, a semi-structured interview was used because it allows both flexibility and structure. It also allows the interviewer to achieve a greater range of data with clarity and further discussion of the answer.

### 3.4 Research introduction

The major focus of this research is to explore the procurement process of company X and identify the challenges in the process. One of the methods of data collection is a direct observation of the activities of the procurement department. The department has about eight (8) employees managing the procurement operations. The author of this thesis work was a trainee in the company between October 2018 to March 2019. During the internship period, the author of this research was able to observe the activities of the company's procurement process, taking the role of participant-as-observer to collect some primary data for this research.

The areas of direct observation covered for this research include:

- Observation of the workflow and document flow in the procurement process.
- Observation of the communications between the end-user and other departments like accounting and logistics.
- Observation of the communication and relationships with suppliers.
- Observation of the purchasing and payment database, as well as supplier database.

The direct observation of the case company's procurement process was done before the literature review of the research, therefore, the data collected is unaffected by theory. It is very important to mention that not all the data collected during observation are reported in this research due to confidentiality agreement.

#### 3.3.2.1 Primary data through interview

Some primary data was collected through a method of a qualitative interview. The purpose of the interview is to shed light on the challenges faced in the procurement process. The

interview questions were derived from the research question "What are the challenges in the procurement process of the case company? and how does e-procurement combat these challenges?" The data collected through direct observation and the literature review were also helpful in formulating the interview questions. The type of interview conducted is a semi-structured interview which starts with some easy questions and gradually progress to more complex ones. The interviewee was informed in advance about the objective of the research. The questions are designed to be as open-ended as possible to give the interviewee the flexibility to provide broad information about the subject.

There are four major questions discussed during the interview. The first interview question is; describe the procurement process of the case company? Although the interviewer is familiar with the process, the question was meant to set the mood of the interview and to get an expert's view on the process structure and other considerations.

The second question that the interviewee was asked is "how effective is the current procurement process?" The purpose of this question is to get the opinion of the current situation of the process.

The third question that the interviewee was asked is to describe the challenges in the process. This question will help identify the areas that can be improved and what can be done to improve them.

In the fourth question, the interviewee was asked to describe the database system used in the department and how effective it is.

During the interview, other questions such as "what are the time-consuming activities in the procurement process? and how information is transferred to other departments such as accounting department, and description of the supplier relationship." Some follow-up questions based on the interviewee's response were also asked. All these questions are important to understand what the procurement process of the case company entails. The interviewee will also be given the freedom to speak on other topics related to the research subject. The interview will be conducted in English to ensure that the interviewee is comfortable and can express freely. Information about the use, the anonymity of the interviewee and objective of the research was communicated in advance in the invitation.

The interview was conducted with a senior procurement analyst of the case company through skype. The employee selected for this interview has a four (4) years working

experience in company X procurement department and a deep insight into the procurement process.

#### 3.3.2.2 Secondary data through email

Some secondary data were collected from an e-procurement solution vendor. The e-procurement vendor used for this research is SAP. The author of this research contacted SAP and requested some information on their e-procurement solution. The vendor was generous to provide the product description of their solution and this material was used in this research. The information was requested from SAP's country manager in Finland - customer solution advisory.

Table 1. Data collection methods, interviewee, date, and topic.

| Data collection method | Contact person position | Date | Topic |
|---|---|---|---|
| Skype Interview | Senior procurement analyst | August 29, 2019 | Procurement process |
| Email & Linkedin | Country manager - customer solution advisory | June 26, 2019 | E-procurement solution |

# 4 Results and analysis

This section presents the major findings of the direct observation of the case company's procurement process, as well as the research interview result. The analysis is also presented in this section using qualitative analysis approach.

## 4.1 Results

### 4.1.1 Observation result

The results obtained from direct observation of the procurement process of company X can be divided into two parts: The activities and document flow in the procurement process, and the challenges identified during observation.

Company X use traditional procurement process. The activities involved in the process from the perspective of direct observation is presented as follows:

- The procurement department receives a purchase request via email from the end-user. A purchase request can come from any department. The request usually contains necessary item specifications.
- There are two trackers in the department, the purchase and payment tracker. Every purchase request is recorded in the department's purchase trackers and they are updated throughout the procurement process. The purchase tracker contains all information about a purchase request such as the item purchased, cost, date, name of requester, department, etc. The purchase tracker is very helpful when treating new purchase requests, especially when purchasing a frequently used item because It shows all the information about a similar item that was previously purchased. This speed up the sourcing process because the source of supply and the previous cost is shown on the tracker. For items with no purchase history, the procurement analyst search for a supply source using the supplier database and the internet. The case company has a google sheet database that contains all information about verified suppliers. Some of the supplier details include tax ID, negotiated discount, payment conditions, etc.

- When treating a purchase request, the procurement analyst liaises with the requester to determine if the item requested is a budgeted item.
- For big purchases, a Request for Quotation (RFQ) is sent to at least three suppliers. When a quotation has been received, the procurement analyst negotiates for the final price and other trade terms. The price and delivery terms of each supplier are presented in a table for comparison. The best supply source is selected and sent forward for approval.
- Each purchase must be approved by the manager of the procurement department, finance department, the manager of the requester's department and finally the general manager. The approval process usually takes between 2-5 days depending on the size of the purchase.
- After approval, a purchase order is prepared using Microsoft excel and then sent to the selected supplier.
- After the receipt of the order, a goods receipt note is issued to the supplier. The payment process is initiated at this point. The item purchased is updated on the purchase tracker as completed.
- When preparing a payment voucher, the procurement analyst must be well informed about the agreements with each supplier. Some suppliers receive a 50% advance payment while some only receive payment after delivery or job completion. This has to be taken into consideration when creating a payment voucher. Before initiating the payment process, several required documents such as the purchase request from the end-user, the quotation from supplier, the approval email, GRN (in case of item request) or a Job Completion Form (JCF) signed by the vendor and the requester (in case of service request), and an invoice from supplier must be available.
- The mentioned documents needed to create the payment for each purchase are scanned and stored in the procurement database for reference purpose. Afterwards, these documents are transferred to the finance department in hard copies for verification and payment completion. The payment tracker is also updated with necessary information about each purchase.

### 4.1.2 Interview result

The interviewee from the case company is a senior procurement analyst whom the author of this research has previously worked with. The first interview question was a description of the procurement process. The description given by the interviewee was like the one recorded during the direct observation at the case company. However, the interviewee mentioned that there has been a little improvement to the purchase requisition process. The end-users now must fill a purchase request form when sending a request to the procurement department. This is automatically updated on the procurement tracker which eliminates the manual entry of the purchase information by the procurement analyst. Although, some requests are still received via email or phone.

The second interview question - "how effective is the procurement process?" The interviewee mentioned the following:

- The process is well structured, and it defines the role of each stakeholder.
- The procurement department has its policy and guidance to allow consistency and control over procurement activities.
- Procurement activities are conducted to allow the business to take advantage of scale and reduce its overall procurement costs.
- The procurement process has guidance on ethical behavior in all procurement related activities in the business.
- There is an emphasis on professionalism and transparency to increase the probability of obtaining the right outcome when purchasing goods and services.

The third interview question - "describe the challenges in the process".

The interviewee mentioned that the procurement process is quite easy, but it is a long and tedious process. He mentioned a few challenges that make the process less effective. Some of the challenges are:

- Supply management - finding and managing qualified suppliers can be very tedious. The traditional approach to procurement reduces supply options and can be very expensive being a lengthy process. Dealing with suppliers can be time-consuming

and it involves a lot of documentation. As a result, the procurement department mainly uses a few frequent suppliers.

- The procurement process is heavily dependent on paperwork. The process has a huge amount of manual and repetitive work. Documents like a quotation, purchase order, payment voucher etc. must be prepared manually with Microsoft excel. This makes the process longer and less effective.
- Long approval process - each purchase request goes through an approval process from the stakeholders which may take about two to five days depending on the type of purchase. These purchases go through the same approval process when preparing the payment. This makes the procurement cycle longer and lengthens the time-to-value.
- Lack of automatic transfer of information and documents - since data are recorded manually and on paper, the documents involved in procurement must be transferred physically to other stakeholders in the process. This must be done before proceeding with the next step in the procurement process leaving room for delays.

In the fourth question, the interviewee was asked to describe the database system used in the department and how effective it is.

The procurement department utilizes a google drive database system. There are several google sheets used to track purchase requests and payments. The purchase tracker contains all information about a purchase request such as the item purchased, cost, date, name of requester, department, etc. The is also a google sheet that contains all supplier information. This data storage method is not the best, but it has proven to be effective.

## 4.2 Key findings and analysis

The table below shows a summary of all the steps involved in the procurement process.

Table 2. Steps in the current procurement process of the company X.

| |
|---|
| Step 1: Purchase requisition raised by any department - operations, sales, finance, etc. |
| Step 2: Purchase request is received and checked with budget by the procurement department. |
| Step 3: The procurement analyst sends an RFQ to different suppliers - minimum 3 quotes |
| Step 4: Analyze quotation, present in a table and put forward for approval. |
| Step 5: Purchase request is approved by the manager of the requesting department, procurement manager, finance manager and the general manager. |
| Step 6: Procurement analyst sends a PO to the selected supplier. |
| Step 7: Delivery is inspected and received by end-user and a finance staff |
| Step 8: Procurement analyst creates payment voucher and attaches necessary documents |
| Step 9: Payment voucher is approved by the managers in step 5. |
| Step 10: The procurement analyst scans and stores all the documents in the procurement folder for reference and updates the payment tracker. |
| Step 11: All the purchase document are transferred to the finance department. |
| Step 12: The finance department receives payment voucher, checks other documents for necessary approvals, validity and accuracy. |
| Step 13: The finance department completes payment. |

The current procurement process has shared information and responsibility flow between different departments. Figure 4 below is a graphical representation of the information and responsibility flow in the procurement process of company X.

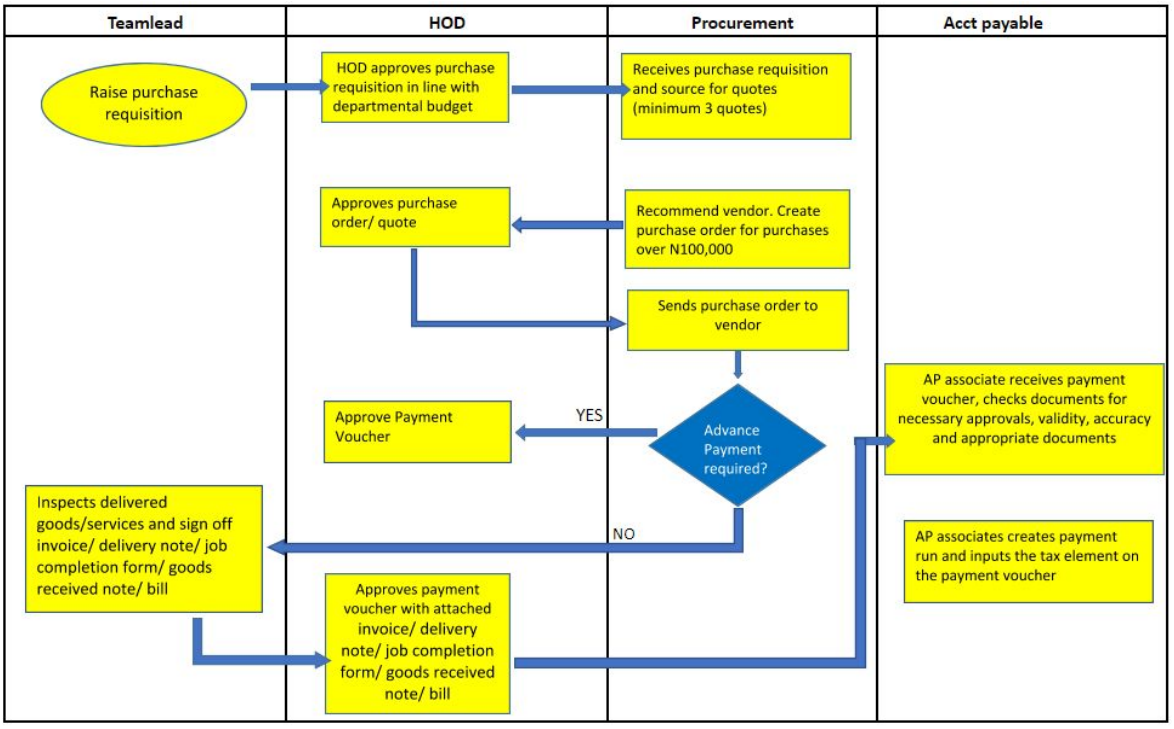


Figure 4. Responsibility flow in the procurement process. Adapted from Company X procurement 2019.

### 4.2.1 Summary of analysis

Challenges

Based on the results of the direct observation and the interview, the main challenges in the procurement process of company X is summarized below:

1. Ineffective supply management - finding and managing qualified suppliers can be very tedious when using a traditional procurement approach. Since the procurement department mainly uses a few frequent suppliers they are unable to capitalize on a wide supply source which can significantly reduce procurement cost. Moreover, finding a new supply through a traditional approach can be time consuming and expensive.
2. Long approval process - each purchase request goes through an approval process from the stakeholders which may take about two to five days depending on the type of purchase. These purchases go through the same approval process when creating the payment. This makes the procurement cycle time longer.

3. Data management - The procurement process has a huge amount of manual and repetitive work. The process is also heavily dependent on paperwork and this opens the possibilities of error or mistake. Tampering and loss of record may also occur, thereby making audit a big challenge.
4. Lack of automatic transfer of information and documents - since data are recorded manually and on paper, the documents involved in procurement must be transferred physically to other stakeholders in the process. This must be done before proceeding with the next step in the procurement process leaving room for delays.
5. Spend analysis - Since all the purchase information are recorded on a google sheet, the visibility of spend and its management can be a very tedious task. Too much time is spent on reporting and spend analysis because they are done manually, thereby making quick decision making a challenge.

### 4.2.2 SWOT Analysis

The analysis below highlights the major strengths and weaknesses of company X procurement process, and also presents some of the opportunities that e-procurement solution will provide to the company.

Table 3. SWOT analysis of the procurement process in the case company.

| **Strengths** | **Weaknesses** |
|---|---|
| • Well-structured procurement process<br>• Clearly defined roles in the procurement process<br>• Experienced professionals that handle complicated procurement | The traditional procurement approach involves challenges such as:<br>• heavily dependent on paperwork<br>• long approval process<br>• too much manual and repetitive tasks. |
| **Opportunities** | **Threats** |
| Introduction of e-procurement will allow:<br>• Cost reduction at the bottom line<br>• reduction in cycle times<br>• supplier management<br>• improved compliance | • Inefficiency may lead to costly procurement<br>• Lost savings due to longer payment timeline and procurement cycle time |

## 4.3 E-procurement Solution

There are many factors to consider when choosing e-procurement solution, and also an overwhelming choices of e-procurement vendors. Panorama Consulting Group categorized e-procurement vendors into three groups (Panorama 2012):

- Tier 1 vendors: this includes big software providers such as Oracle, Microsoft Business Solutions, SAP, etc. They are the major players that offer standard business software solution on the market. Organizations that often use this type solution have complex operational structure and global presence. The solutions offered by these companies are the most comprehensive on the market.
- Tier 2 vendors: according to Panorama consulting, the software packages in these category have medium complexity and size. These solutions are comprehensive and agile enough to fit specific needs of many organizations. They are usually less difficult to implement and maintain when compared with tier 1 solutions. Some vendors in this category are Deltek, Aptean, Batchmaster, etc.
- Tier 3 vendors: vendors in this group develop enterprise solutions for small to mid-sized organizations with relatively simple process structures. Majority of these solutions are customized to a specific industry and, thus, may be able to offer enhanced functionality than tier 1 or tier 2 enterprise solutions.

This research will focus on the enterprise solution offered by SAP because it has the largest business software in the world. SAP has countless business software solutions of an entire supply chain of different industries like manufacturing, service, etc. This software provider was selected because the author is very familiar with this company and has some working experience using their softwIn this section, the SAP e-procurement solution will be analyzed, highlighting some of its value offers and opportunities.

### 4.3.1 Overview of SAP Company

SAP's history dates back to 1972 when it was founded by five former IBM employees in Waldorf, Germany. The acronym SAP stands for System Applications and Product in Data processing. The company dominates the world market for enterprise business software by offering high-quality products and services and help businesses of all sizes to operate profitably and adapt continuously. Today, SAP has over 437,000 customers in more than

180,000 countries and over 98,000 employees. The company also has more than 18,000 partners globally. Some of SAP's customers include; General Motors Corp., Bayer A, DHL, Shell, Daimler AG etc. (SAP corporate fact sheet, 2019).

The product portfolio of SAP encompasses products that are designed to satisfy the information needs for all business sizes - including software for small to large multinational enterprises. "SAP Business One" is a complete package that helps small businesses to streamline processes, gain business insights and make decisions based on real-time data. SAP S/4 HANA is one of the latest solutions for enterprise management. This solution utilizes intelligent automation to unlock new levels of performance across the organization, maximizing business agility with standardized processes and fast time-to-value. (SAP overview, 2019). The S/4 HANA solution covers Sourcing and Procurement, Supply Chain, Finance, Manufacturing, Marketing, Sales, Service, Asset Management, and Research & Development.

SAP system modules are designed to cover all functional areas of a modern business enterprise. Each of the modules contains transactions for entering, changing and displaying data.

### 4.3.2 SAP e-procurement solution

This subsection will discuss SAP e-procurement solution and its features. The data about this solution is obtained from the e-procurement vendor.

SAP Ariba is an e-procurement solution that helps companies maximize efficiency in their procurement process. It enables them to increase visibility and control with operational flexibility to get the best results. This solution helps companies achieve repeatable cost savings and improved compliant processes.

SAP e-procurement solution digitally transforms procurement processes with fast innovations in areas such as user experience, supplier collaboration, and the adoption of intelligence technologies such as machine learning and process automation. This type of digital transformation is enabled by using SAP S/4HANA together with SAP Ariba. SAP S/4HANA is the digital core of the e-procurement solutions, and this allows companies to manage massive amounts of data, and have access to real-time digital visibility into all operational areas.

SAP Ariba solutions provides a complete source-to-settle functionality that broadens the core operational processes. This functionality covers cooperative sourcing and contracting, supplier control, guided buying, and end-to-end supplier collaboration to deliver a new, guided, and easy user experience over Ariba Network. (SAP Ariba, 2018).

Figure 5 below shows the integration between SAP S/4 HANA and SAP Ariba.

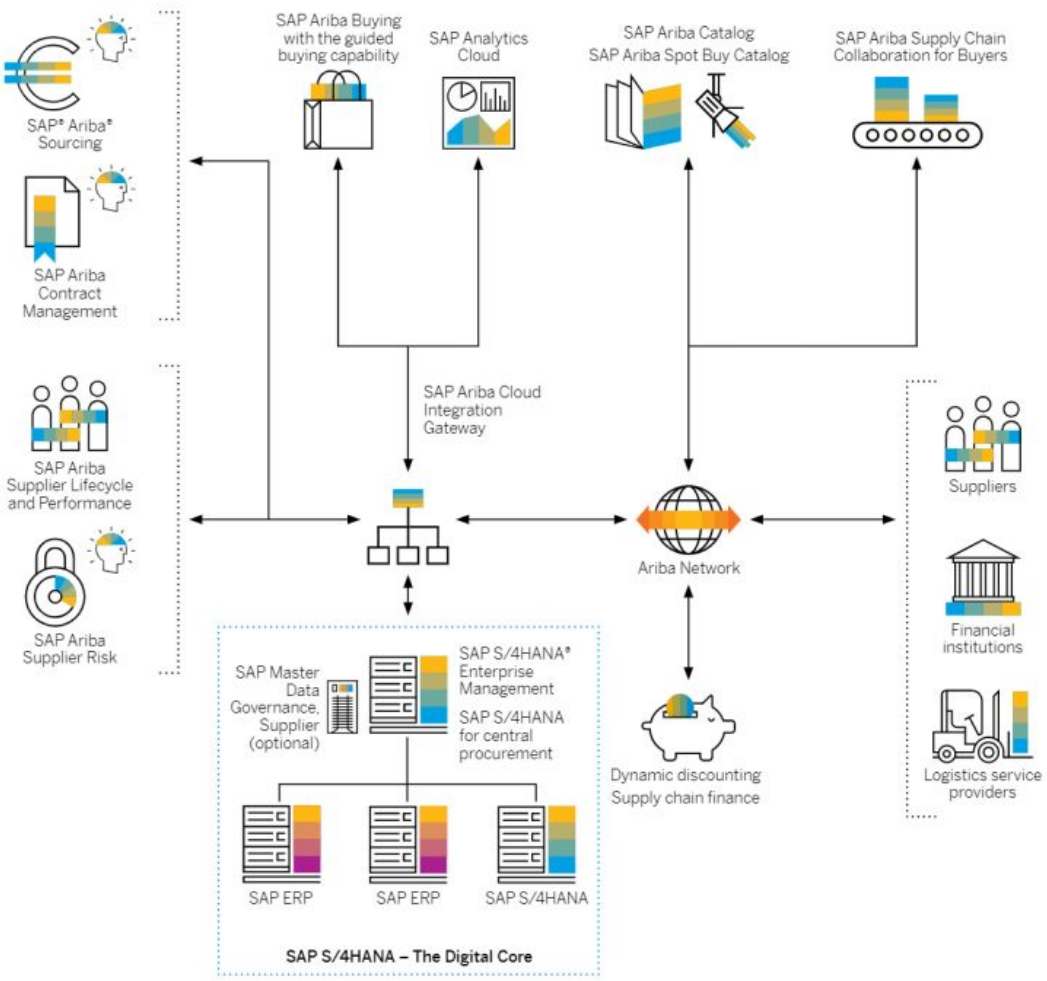


Figure 5. SAP S/4 HANA and SAP Ariba Solution Landscape (SAP 2019).

- Sourcing solution

SAP Ariba allows companies to manage their entire sourcing, contracting and spend on a single platform. With the spend analysis insights, decision making becomes easier for procurement analysts. This solution allows negotiation with suppliers for sustainable savings on both indirect and direct materials. SAP Ariba helps companies minimize risks and expedite

contract lifecycle with built-in contract management functionality. The integration of this solution into the execution and procurement processes helps the company to:

- Accumulate and categorize all purchases across the company
- Gain clarity on expenditure of different segments and recognize saving opportunity
- Create similar source-to-contract processes across business units
- Ensure savings in material cost and improvement in all spend categories
- Guarantee the achievement of bargained savings
- Decrease risk by seeking innovation partners and reliable suppliers

(SAP Ariba, 2018).

- E-procurement solution

SAP Ariba e-procurement solution helps companies improve their end-to-end buying and settlement process. This software solution delivers negotiable saving and improves the bottom line by turning an old cost center into a revenue source. This solution allows greater control over costs and risks in the buying process by; reducing buying cycles by 50%, cutting supply cost by 10 % and lowering processing costs by 25% - 60%. SAP e-procurement solution offers companies a vast set of capabilities on the market like:

1. SAP Ariba Buying and Invoicing

This feature provides a fast, guided buying experience with smooth catalogue maintenance and a customizable interface. The visibility tools and flexible management capability of this solution helps businesses to become more agile. The built-in approval flows that ensure both catalogues and contract compliance helps deliver a quick ROI. According to SAP, this capability enables the bargained savings reach the bottom line. The benefits of SAP Ariba Buying and Invoicing capabilities include:

- By complying with procurement guidelines, SAP Ariba buying and invoicing provides an easy and exquisite shopping experience, as well as guide employees when buying goods and services.

- This solution allows procurement analyst to get more visibility and spend control. As a result, more savings are delivered to the bottom line.
- It allows companies to manage budgets, approvals, suppliers, procure-to-pay processes, and payments settlement globally.
- It allows easy integration with other ERP solutions. This enhances the usability, speed, and performance of procure-to-pay process, from requisition to reconciliation.
- Lower costs and risks – Competition among suppliers reduce costs and risks.

- It broadens procure-to-pay process into the cloud, allowing efficient and effective collaboration with suppliers on Ariba network.

(SAP Ariba buying and invoicing datasheet, 2018).

2. SAP Ariba Guided buying

The guided buying capability of SAP Ariba solution brings buyers and suppliers together to help simplify procurement. This e-procurement capability shifts the buying responsibility of some simple low spend transactions to employees. By following the company's procurement guidelines, employees can buy goods and services in a smart way from approved suppliers with little assistance from the procurement team. With SAP guided buying capability, companies can;

- Expand supplier participation using integrated supplier performance management tools.
- Have direct collaborative supplier relation through the buying interface.
- Ensure compliance with procurement guidelines in the buying process.

The guided buying capability is integrated with other SAP Ariba procurement solutions, allowing the use of existing catalogues an approval flows. This solution also enhances collaboration and information sharing with procurement and colleagues. (SAP Ariba guided buying datasheet, 2017).

3. SAP Ariba Spot Buy

The Spot Buy capability is a custom business-to-business (B2B) marketplace that provides buyers with an easy and controlled way to find and buy non-sourced or emergency purchases with competitive prices and delivery options. Using SAP Ariba Spot Buy Catalogue, buyers and employees can find and the goods they need from high-quality, trusted suppliers. With the built-in, customizable controls, procurement organization can use this capability to improve buying compliance and savings across the enterprise. The benefits that companies realize from SAP Spot Buy capability include:

- Cost savings: this solution provides the tools and insights to capture greater price savings and reduce sourcing costs.
- Productivity and process improvements: The Spot Buy helps streamline the buying process and simplify vendor management.
- Greater spend compliance helps accelerate user adoption, identify buyer demand signals, and access a streamlined and compliant order-to-pay process.

4. SAP Ariba Procurement Mobile App

SAP Ariba mobile app is another procurement solution that helps procurement staff stay in control and connected with the business to make timely and effective decisions on the go. The mobile procurement solution helps to review and approve requisition anytime and anywhere, which leads to faster time-to-value and shorter procurement cycles. This mobile solution has a user-friendly interface and secure access to SAP Ariba's procure-to-pay solutions. It is available for both IOS and Android smartphones. With SAP Ariba's advanced mobile procurement tools, companies can:

- Approve or deny requisition quickly, view requisition details, attachments and add comments.
- Streamline shopping through comprehensive catalogue search by keyword, supplier, and part number.
- Shorten procurement cycle times by enabling staff to quickly approve or deny requisitions on the go.
- See multiple shopping carts with at-a-glance visibility to any pending purchases
- Pin requisitions for fast reference and future follow-up.

(ariba.com/sap-ariba-mobile. 2019)

5. Procurement Operation Desk

SAP Ariba procurement operation desk capability provides a scalable, collaborative, and transparent way to review, validate, source and approve purchases. It helps companies boost procurement operations productivity and performance. This capability automates the procurement operations support process and provides stakeholders with a simple and seamless way to:

- Maintain service-level agreements (SLAs)
- Prioritize requests based on SLAs or to meet critical needs
- Assign procurement desk tasks
- Always know the status of each request
- Work together on service requests across teams
- Track a growing number of procurement support requests.

## 5 Recommendation

The answers to the research questions will be given in the form of a recommendation to the case company. This section will discuss how the e-procurement solution mentioned above can combat the challenges in the current procurement process of company X.

One of the main challenges of the procurement process is inefficient supply management. The current traditional approach to procurement does not allow the company to tap into the advantage of getting a competitive price from its suppliers. The procurement team only send RFQ to a few frequent suppliers, by so doing, the possibility to reach vast supply source and get competitive price is lost. This challenge can be remedied with the adoption of e-procurement. When the company's procurement is taken online, the possibility to reach a broader source of supply will be very easy. The Spot Buy capability of SAP Ariba provides the right solution. The procurement staff can connect with a large amount of high quality and trusted suppliers and easily find the goods they need using the Spot Buy catalogue. This e-procurement solution provides the tools and insights to capture significant price savings and reduce sourcing costs. Using this solution will improve buying compliance and savings across the enterprise. The cost element of economic value added (EVA) is visible here, as lowering purchasing costs will impact the company's profitability.

The second challenge in the current procurement process is the lengthy approval process. Completing a purchase request requires two separate approval from the same set of managers. An approval must be obtained before sending a PO and before processing payment to complete the purchasing cycle. This challenge is significant because the duration for the two-approval process may take more than a week, thereby making the procurement cycle time longer. This challenge can be resolved with the procure-to-pay capability of e-procurement solution, which enables the company's procurement to be more agile by allowing better spend control, with flexible management and visibility control. This solution will deliver a quick ROI through built-in approval flows that ensure both catalogues and contract compliance. As a result, the procurement cycle time is reduced significantly, and the negotiated savings reach the bottom line. Research by Aberdeen Group (2001) reached the same conclusion that the cycle time reduction by e-procurement will significantly impact the revenue generation potential for a firm because products get to market faster allowing the firm to capture the market share of the first-to-market position.

Another challenge in the procurement process is the massive amount of paperwork for each purchase transaction. The process involves a substantial amount of manual and repetitive work that is time consuming such as manual data recording on the purchase and payment tracker, preparing a PO with excel etc. The time spent on these manual tasks can be better spent on strategic tasks like supplier management. The entire procurement process can become more efficient by automating some of these manual tasks. E-procurement enables integration between strategic and operational procurement, allowing the automation of the company's buying governance by integrating internal catalogs, stocked items or outline agreements. Automation of these processes eliminates or minimizes the amount of paperwork and the possibility of mistake, which, as a result, reduces the company's procurement transaction cost. As Davila, Gupta and Palmer (2003, 17) argured, adopting e-procurement can reduce up to 42% procurement transaction cost. Measuring this e-procurement benefit will show an impact of EVA on the company's profitability.

The fourth challenge that was identified in the procurement process of company X is the lack of automatic transfer of information and documents. Since data are recorded manually and on paper, the paperwork involved in the procurement process must be transferred physically to other stakeholders. The physical transfer of paperwork does not only waste time but also opens the possibility of loss or tampering. An e-procurement system eliminates this problem. Procurement staff and other stakeholders have access to real-time data when procurement is done online. Employees with authorization can view procurement information, status and documents on the system. This e-procurement capability saves time, ensures data integrity and efficient information flow throughout the procurement cycle.

The last challenge identified in company X procurement process is the manual method of spend analysis and management. The use of google sheet to record purchase information makes spend analysis and management a time consuming and very tedious task, which leads to ineffective decision making. When e-procurement is adopted, procurement information is already stored in the system, making spend analysis and reporting very easy. The spend analysis on SAP Ariba provides an excellent solution for this problem. It classifies and enhance purchase data, and deliver analytics to that enables the procurement team to identify sourcing opportunities, monitor compliance and develop effective sourcing strategy.

Adopting an e-procurement strategy will significantly improve efficiency in company X's procurement process. Besides solving the challenges in the company's current procurement

process, e-procurement adds countless other benefits such as guided buying - a feature that encourages self-service procurement. It empowers end users with excellent buying experience by enabling authorized employees to purchase low-cost material from suppliers following procurement guidelines. This feature significantly reduces free-text requisitions using catalogues, dynamic forms and templates. It also frees up time for the procurement staff to attend a more complicated procurement task. The mobile solutions also help procurement staff at the case company to make timely and effective decisions on the go.

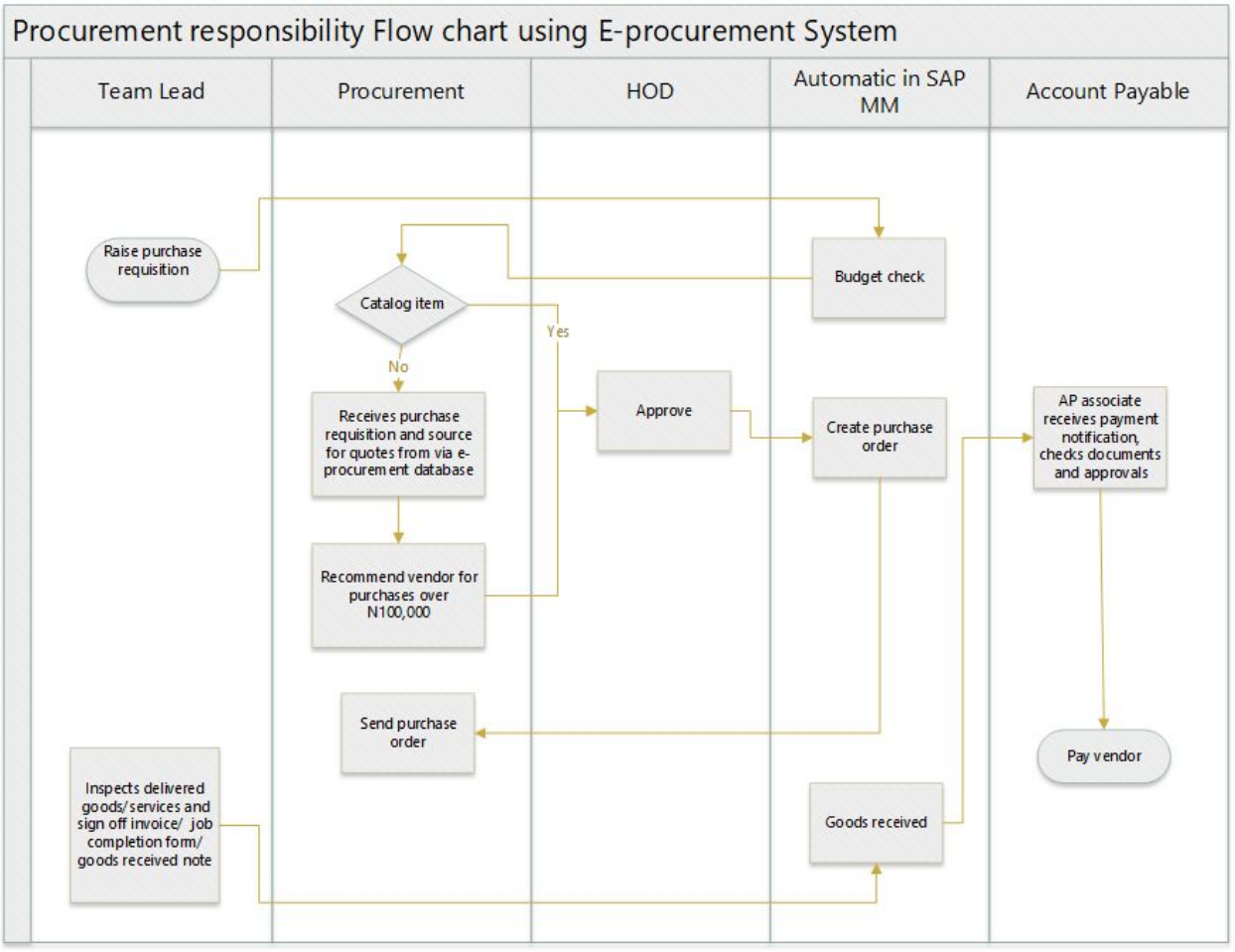


Figure 6. Proposed procurement process with e-procurement solution.

In the proposed procurement process, as shown in figure 6, the responsibility of purchasing some frequent and low-cost materials is shifted from the purchasing coordinators to the

requestors themselves. The e-procurement system enables them to buy the needed materials in compliance with procurement guidelines. The e-procurement system performs budget check, send approval notifications and create the purchase order automatically. After the delivery of the service or products, the requestor acknowledges the receipt and create the Goods Receipt (GR) on the system, and then invoice can be posted for payment.

Table 4. Current challenges and proposed e-procurement solutions

| **Current procurement challenges** | **Proposed e-procurement solution** |
|---|---|
| Too much time spent on purchase analysis and reporting | The system has built-in analytics and reporting templates |
| Two approval process often accompanied by email remainders | Single approval process with automatic notification |
| Huge amount of paperwork | Eliminates paperwork |
| Manual tasks like updating the purchase and payment tracker, preparing PO with excel etc. | System automatic update, in-built PO templates |
| Physical transfer of data and documents | Documents and real time data available on the e-procurement system to all stakeholders |
| Requires many staff | Few procurement staff needed |

## 5.1 Risk of implementing e-procurement

Adopting e-procurement solution will help company x resolve the current challenges in its procurement process as discussed in the previous section. However, new challenges and risks may arise as a result of the adoption of this technological solution. It is imperative that the case company is aware of any possible risks that may arise. Some of the major risks are discussed below:

- Integration challenges

To realize maximum efficiency and to get full e-procurement benefits, these systems must be integrated with the existing internal infrastructure. This is an important factor to consider when adopting e-procurement. The case company already has significant investments in infrastructures such as inventory management system and Logistics system. As pointed out by Davila, Gupta and Palmer (2002, 19), failure to integrate will create a repetitive work step and put the organizational information at risk.

- Supplier resistance

Adopting e-procurement would require that external stakeholders such as suppliers would have to invest in similar technology to perform business online and facilitate communication. Since the case company mainly conduct business with local suppliers, these may be a challenge for small sized businesses, and companies with low margin, as they may be unable to meet such demand without guarantee of a future revenue stream. New suppliers are also required to meet the company's business criteria to be accepted into the supply network. This requirement may limit the case company's access to a large pool of suppliers which is a major benefit of e-procurement.

- Unauthorized access

One of the major benefits of e-procurement systems is that they allow easy access and control of operations and information flow. However, if proper actions and security controls are not in place, unauthorized access can severely disrupt the entire supply chain operations, causing significant negative impact to the company.

## 5.2 Conclusion

The objective of this thesis was to explore the procurement process of the case company, identify the challenges and propose the implementation of an e-procurement solution as a means of eliminating the problems, and optimizing the procurement process. The theoretical analysis of this research has shown the importance of procurement functions in a company. Therefore, an effective procurement strategy is vital to the overall organizational success.

This research was specifically designed for company X (an online marketplace), focusing on its non-trade procurement materials. However, this research can also apply to other companies with similar procurement requirements such as fast cycle times, competitive supply options. The research questions were answered and the analysis of the company X procurement process showed the need to implement an e-procurement strategy to maximize efficiency. The SWOT analysis showed the significant weaknesses and threats in the case company's procurement process. Section 4.3 discussed e-procurement solution from a reputable vendor. The benefits and value of SAP e-procurement solution were also outlined.

The recommendation showed how SAP e-procurement solution would solve the challenges of company X procurement process and improve its efficiency. Figure 5 illustrated the proposed procurement process at company X with e-procurement solution. New risks that may arise from adopting e-procurement solution was also pointed out.

The scope of this research only covers the benefits, risks and impacts of e-procurement solutions. For further study, other aspects such as the need specification of the company, and the financial implications need to be given serious consideration before adopting e-procurement solution. During this research, not many pieces of literature could be found on companies that have adopted e-procurement. Further investigation on the success stories and challenges faced by these companies would be beneficial to companies looking to implement e-procurement strategy.

## 5.3 Reflection on the research

This research provided an opportunity to gain in-depth knowledge of a topic that I was very interested to learn. Procurement as one of the supply chain activities was my favourite topic in school. Combined with my profound interest in technology, I was able to formulate the subject of this thesis. Learning how technology can improve business processes was my biggest motivation for choosing this topic.

This thesis work required me to be strategic and analytical to achieve the objective of this research. My internship experience at company X and previous knowledge using SAP e-procurement software were very useful in this research. This project consisted of different stages and I learned new skills from each step. While gathering data for this research, I

learned to select the most relevant information and maintain an objective view when analysing different arguments. One challenge faced during this research was time. The writing of this thesis took longer than originally planned, mainly because I was working full-time while conducting this research. However, I am happy with the outcome of this research, as I have gained meaningful and invaluable experience, improved many skills, and learned how to conduct research properly.

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Appendix 1

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