

# Project Report

**Improving Procurement Performance with E-business Mechanisms  
In  
Sierra Rutile Ltd**

**Name: xx\*\*\*xx**

**Enroll No.: xxxx\*\*\*xxx**

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A dissertation submitted in partial fulfillment of the requirements of  
\*\*\*Masters in Business Administration – International Business\*\*\*

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## CERTIFICATE

This is to certify that the project work entitled “**Improving Procurement Performance with E-business Mechanisms**” is a record of bonafide work carried out by Mr. **\*\*\*xxxxxx\*\*\*** under my supervision towards partial fulfillment of the management programme course (MBA) of the **\*\*\***.

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**Place**

**Date**

**Name**

**Designation**

**(Project Guide)**

## ACKNOWLEDGEMENTS

In pursuing and completion of my MBA and other commitments, I undertook the task of completing my Project on “**Improving Procurement Performance with E-business Mechanisms**”. To this and I would like to thank and convey my gratitude to the people who guided me to accomplished this wonderful study.

I also record my thanks to some manufacturers, distributors and customers involved in the online transaction. Some of whom were frank and forthright and a few who were slightly apprehensive but nevertheless gave me their full co-operation. To all those I owe a debt of gratitude.

I am fortunate in having sought and secured valuable guidance, continuous encouragement and strong support at every stage of my guide and supervisor **\*\*\*GuideName\*\*\*** and am deeply grateful to him/her.

Finally, I also acknowledge with deep gratitude, the immense support I received from my family members who have always encouraged me and have been a source of inspiration and help in continuing my effort.

Last but not the least my special thanks go to all those who have given all the secretarial support – despite all other commitments.

**\*\*\*Student Name**

# Chapter 1

## Introduction

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# Chapter 1: Introduction

Traditionally the optimisation of each single transaction has been the primary efficiency driver. The focus has therefore often been on the paid price in each transaction. However, managers have realized that procurement behaviour may have a strong impact on indirect procurement costs. These indirect costs, e.g. costs for handling goods, storage, supplier handling, capital, administration of orders, are sometimes better targets for cost reductions than price. To attack indirect costs business partners often have to collaborate. It requires mutual adjustments of equipment, systems and working methods.

Companies have been evaluating business partners' resources to see how they can be used to increase efficiency. As a result the procurement procedures are changing from paper-based labour-intensive to integrated electronic procedures that automate or facilitate human interactions. These new electronic procurement (e-procurement) systems however require complex mechanisms that allow business processes to be integrated across company borders. Successful implementation requires active participation by both trading partners to adapt work- and information flows to get the right information at the right time.

These types of effort to integrate resources across company boundaries and align objectives to deliver greater value are today known as supply chain management (SCM) initiatives. The main stated objectives of SCM are to lower costs and to improve customer service. The interest in SCM has steadily increased since the 1980s when more and more companies began to realize the benefits of collaborative relationships.

SCM follows a recent trend among management concepts. Managers agree that both strategic and operational benefits can be achieved by integrating or coordinating separate functions or activities. SCM involves coordination of an organisation's internal planning,

manufacturing and procurement efforts with its external partners such as suppliers and retailers but also customers.

Coordination of functions and activities between different companies has never been unproblematic. For instance, the adoption of electronic linkages between companies has not been as uncomplicated as first expected. The most common technology has previously been electronic data interchange (EDI). Although EDI achieves integration it still has several weaknesses as for instance inflexibility and low maintainability. However, since the mid 1990s, innovations in new communication systems, such as Internet technologies, have created new opportunities for communication between companies and enabled a unique flexibility in the supply chain. Today there is hardly any dispute about the notion that electronic business (e-business), i.e. conducting business on the Internet, is one of the most remarkable business paradigms of our time. More and more companies bet on its applications as a key imperative for their success.

## **About Sierra Rutile Ltd**

### **Sierra Leone**

The Republic of Sierra Leone is a constitutional democracy located in West Africa. Since the end of a civil war in 2002 the country has held two peaceful democratic elections, which have included a change of governing party and president. It is now regarded as a strong example of post-civil war reconstruction and reconciliation and as a powerful force for democracy in West Africa.

Sierra Leone is ranked by the World Bank as one of the most open countries to foreign investment (ranked 29th out of 183 countries surveyed in the 2012 World Bank Doing Business Report). It enjoys a stable government, well documented laws and property rights, and a responsible fiscal regime.

### **Mining in Sierra Leone**



Sierra Leone is a pro-mining country where mining contributes a significant proportion to the country's GDP and makes up the majority of its exports. It is currently an exporter of rutile, iron ore, bauxite, gold and diamonds, with significant expansion plans for its rutile (Sierra Rutile) and iron ore sectors. The country allows 100% foreign ownership of its mining assets and has recently launched the Extractive Industries Transparency Initiative to ensure the responsible and open development of its significant natural resources.

Sierra Rutile has a strong, longstanding relationship with the people and government of Sierra Leone, being a long-term contributor of significance to the country's GDP and exports.

Sierra Rutile is one of the largest private sector employers in the region of its operations, and in the country as a whole. Sierra Rutile is also committed to local procurement and the sustainable development of its assets.

Sierra Rutile is a leading mineral sands company, operating world-class assets in Sierra Leone. Sierra Rutile is in the process of significantly expanding its core rutile production, with associated increases of zircon and ilmenite by-products.

## **Products**

Sierra Rutile's core product is rutile, one of a group of titanium dioxide minerals ( $\text{TiO}_2$ ), predominantly used in the manufacture of white pigment. Rutile, as well as other  $\text{TiO}_2$  minerals, are used in the pigment industry, due to their particularly high brightness and opacity characteristics. White pigment itself is then used in the global paint, plastics and paper industries.

Rutile is known as a "high-grade" feedstock for pigment manufacture as it requires significantly less processing than other feedstocks in the pigment manufacturing process. This means manufacturing of pigment from rutile consumes less ore, coke and chloride than for other  $\text{TiO}_2$  feedstocks, while at the same time generating less waste; making rutile the premium pigment feedstock.

Rutile is also used in increasing volumes in titanium metal production, where rutile's high titanium content makes it the preferred source of titanium units. Sierra Rutile also produces by-products of ilmenite, a lower-grade pigment feedstock and zircon, used in the global ceramics industry.

## **Statement of the Problem**

EDI (Electronic Data Interchange) have been the most important information communication vehicle but the Internet is being used more and more. This report focuses on the problems and opportunities of industrial goods and services may experience if they decide to integrate their procurement processes with their suppliers via the Internet. We intend to examine which the driving and inhibiting factors are as well as their impact on the distributor's decision to integrate with the supplier or not.

## **Why is the particular topic chosen?**

As a student, I would like to further deepen my knowledge about the process of procurement. I am very interested to investigate all the aspects presented for this study.

I believe that this topic can be utilized as a reference in the study of my course as well as company job profile.

## **What contribution would the project make and to whom?**

This would focus deeply in providing effective solution for procurement performance.

**CHAPTER 2**  
**OBJECTIVE AND SCOPE**

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## **CHAPTER 2: OBJECTIVE AND SCOPE**

### **Objective:**

- Integration of the procurement process affect the purchasing procedures
- Drivers of integration of the procurement process
- Inhibitors to integration of the procurement process

### **Scope:**

This project is developed for Improving Procurement Performance with E-business Mechanisms.

**CHAPTER 3:**  
**THEORETICAL FRAMEWORK**

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## CHAPTER 3: THEORETICAL FRAMEWORK

As supply chains evolve from having an internal to an external focus where collaborative relationships become more and more important, organizations may experience greater benefits. The development model that describes each stage in the e-business development process was deployed by Metts. It is proposed that e-business development takes place in four stages where the model cost, technological demands and complexity increase by each stage. The four stages are:

- Presence
- Portals
- Transaction integration
- Enterprise integration

The model is sequential but it allows companies to enter at any stage. All the previous stages issues must however be addressed.

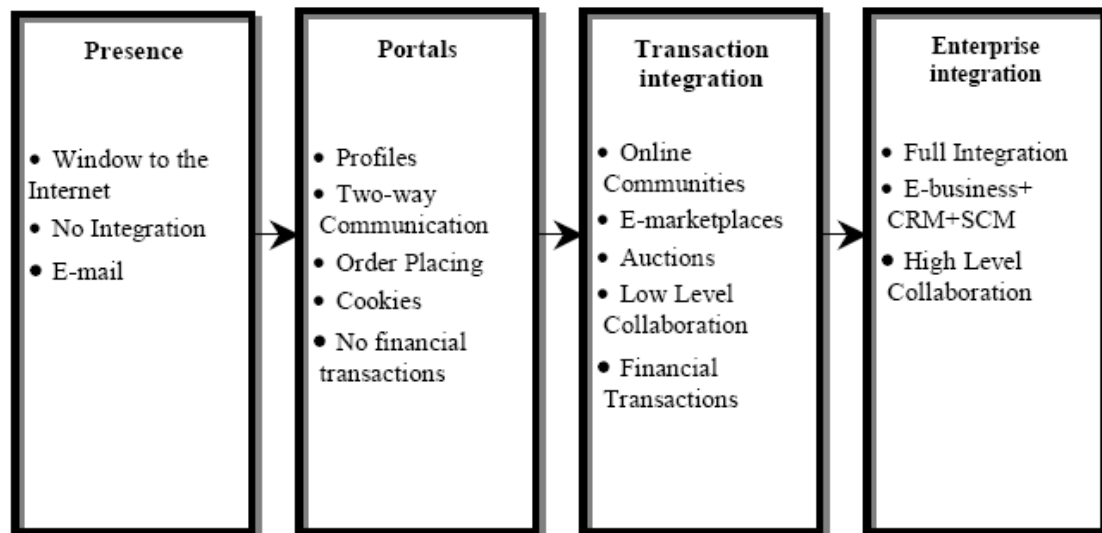


Figure 1: Stages of e-business development

## **Presence**

The presence stage involves the first step that an organisation takes to explore the possibilities of e-business. A company having a Web site for one-way communication to any potential visitor characterizes the first stage. There is no integration with neither internal nor external processes. The presence stage is primarily used to attract new customers.

## **Portals**

The second stage is characterized by the introduction of two-way communication, customer order placing and the use of cookies and customer profiles. Cookies are small text files that are stored on the computer when you access a website. The file contains information that identifies each user. Other than attracting new customers, companies are therefore given the opportunity to engage and retain visitors and relate them to their individual preferences for customization purposes. The portals stage is also characterized by the ability to link displayed information with inventory data and search capabilities for the users. It is however not possible to process financial transactions.

## **Transaction integration**

The third stage is differentiated from the preceding stages, mainly by the presence of financial transactions between partners but also by the fact that interactions can be for both buying and selling. Transaction integration involves participation in online communities, electronic auctions or third party electronic marketplaces (e-marketplace). An e-marketplace is an online market where buyers and seller meet to exchange information, conduct trade and collaborate with each other. Integration at this stage is viewed as the integration of internal processes, which allows the optimisation of all the operations inside the organisation.

## **Enterprise integration**

This level of integration involves high levels of collaboration between trading partners. The collaboration includes e-business, supply chain management and customer

relationship management (CRM). CRM is a way for companies, generally by using software and or Internet capabilities, to manage customer relationships in an organised way. At this stage partners' IS melt together into one system that serves all needs. It is however somewhat of an ideal concept and companies need to solve hard technology problems and over-whelming integration issues to reach this stage. However, those companies that do become successful in this stage can be distinguished by:

- Intimately understanding their partners' current and future strategic needs;
- Working proactively with their partners to create solutions that address these needs;
- Using information sharing;
- Having long-term contracts.

### **Enabling technologies**

There are two main types of inter-organisational systems, i.e. systems that connect two parties and allow them to interact with one another and share data, EDI and the Internet. Both these systems will be covered here. In order to integrate the ERP-system or the internal information-system with the Internet, another solution called application integration is also needed.

### **Electronic data interchange**

The major goal of EDI is to reduce the time that is spent on printing, mailing, and re-entering information. EDI plays an important role in the improvement of process management. It allows companies to exchange data directly through computer-to-computer communications. Paper documents such as purchase orders, shipping documents, invoices and payments are replaced with electronic documents. EDI links the computer processes and allows the electronic documents to be transferred without any duplicate data entry.

To register the information directly in the receiver's system, the electronic documents have to be standardized. There are on the other hand no single common standard among



EDI users. Some of the most frequently used standards are EDIFACT, an international standard developed by UN, and ANSI-X12, the dominant standard in the USA. Many researchers argue that EDI will continue to be an important communication vehicle for years to come. Many companies have already invested heavily in EDI, and have also achieved benefits. Their incentives are consequently not strong enough to switch to other technologies such as the Internet. However, because of the complexity of EDI and the fact that it does not provide the flexibility and maintainability demanded, companies that are not yet integrated are now looking for other technologies instead.

### **The Internet and XML**

EDI has been in use for more than 30 years but its diffusion rate has been slow. It is partly because of its complexities and because it is still viewed as an insecure and vulnerable vehicle for sending business documents, but also due to that EDI over private lines or value-added networks (VAN) is too expensive for SME. There is however hope that the event of Internet-EDI (I-EDI) will turn the tide. With the development of the Internet new possibilities have risen for e-business. Since the Internet is open to everybody, is accessible all over the world and has an easy interface in the form of the World Wide Web (WWW), many organisations can be reached. The Internet is also cheaper than VAN that charge money for each message or collection of messages. The Internet gives small companies a new opportunity for integrating with suppliers.

The documents and messages that are sent between organisations via the Internet must be manageable for each involved enterprise, independent on which information system that is used internally. A way to solve this problem is by using the extended mark-up language or XML. XML is a programming language that is designed to improve the functionality of the Internet by structuring the information in a flexible manner. Researchers argue these changes brought by Internet technologies could have a profound effect on companies and especially SME.

The flexibility of XML however also brings some risks. Each organisation can develop its own dialect of XML messages suited to its own business processes. If that is the case they will not be able to understand other dialects. Applications using XML is driving the adoption of e-procurement. Therefore standards or mapping (matching of document standards between trading partners) has to be used.

### **Application integration**

In the last decades companies have used EDI for electronic exchange of structured business documents. The development of the Internet and XML has however led to an increased use of new software called Application integration (AI

AI is a software system that is implemented with other software systems and that manages interactions between applications and other information resources. One application puts (publishes) a message to a message-broker. The message-broker then transforms the message to the appropriate format before the receiving application gets (subscribe) the message. AI systems are designed to let applications share processes and data as if they were a single system. One of the advantages of AI is that they leave systems as they are, minimising change, and still allow information to be shared.

There is a need to define the range of AI applications as well as to categorise the types of systems that can be integrated through these applications. The proposed classification is to divide AI into two different categories:

- Intra-organisational AI
- Inter-organisational AI

The first category includes the integration of different systems within the company. Many organisations consist of a set of complex, heterogeneous internal information systems that cannot communicate with each other. AI can bridge the gaps created by these systems, since it allows functionality from the different systems to be integrated. The second subcategory is inter-organisational application integration and these seek to incorporate cross-enterprise business processes and systems in the supply chain.

## **e-Procurement**

Research suggests that the organisational procurement process involves a complex series of events that allow a firm to go from the recognition of a need, through technical specification and potential supplier evaluation towards a final purchase decision. Although a general pattern exists, execution of the procurement event varies greatly from decision to decision, due to the difference of complexity of the product bought. It is also suggested that there are three different buy classes that affects the procurement process. These are; straight re-buy, modified re-buy and new task buying. It is further proposed that the three buy classes differ in the extent to which decision makers;

- consider the purchase situation to be new or unfamiliar (newness of the problem),
- gather additional information (information requirements),
- Seriously consider new alternatives (consideration of new alternatives).

It is predicted that these three criteria increases in value as the buying situation change from straight re-buy to modified re-buy to new task buying.

For decades companies have been searching for ways to cut paperwork, reduce costs and to increase the efficiency of their procurement procedures. The Internet now penetrates every corner of our society and its use for determining optimal order size, making orders and identifying the best supplier can now be applied by most companies. For some companies the move into online procurement has been a necessity to survive.

### **Buying centre characteristics**

The buying centre contains of a group of employees that initiates, considers and makes a purchase decision in an organizational setting.

The structure of the buying centre is characterized by;

- Size: number of individual participants

- Hierarchical level: managerial authority levels
- Functional level: specialization by work area
- Participation: involvement in procurement stages by members

## **Size**

Research shows that the size of the buying centre increases as roles in the buying centre become more formalised and as the complexity of the purchase process increases. The buying centre for e-procurement, i.e. the buying centre when using e-business tools for procurement, decrease both the formalisation of the buying centre roles and the complexity of the purchase decision. This also brings a reduced size of the buying centre.

In addition to traditional modes for communication, documents, opinions, commercial and technical information can be exchanged through e-mail, Web-based videoconferencing and chat. Formalization, i.e. the extent by which activities are prescribed by rules, policies and procedures, is reduced as effective communication replaces the need to manage the information flow and paper work tightly. The perhaps largest benefit of e-procurement applications is that they eliminate these obstacles of formalisation. Further, because of the increased level of communication between members, the business relations between buying centre members become more informal.

Regarding the complexity of the purchase decision, e-commerce tools, such as comprehensive online databases of purchase history, enable buying centre members to access relevant product information quickly and efficiently, which increases the accuracy of information and decreases the time spent on searching for information.

Consequently, reduced formalisation and overall complexity in the purchasing process are expected results from the adoption of e-procurement tools. As information is easier to access and transfer among buying centre members, fewer members are required to make decisions. Thus, the adoption of e-procurement tools is expected to decrease the size of the buying centre.

## **Hierarchical level**

An individual's formal rank is strongly connected to the acquisition and utilization of procurement information. Individuals of different hierarchical levels, senior managers, plant managers, production technicians, and others, differ in the number of decision stages that they participate in.

As software automation results in fewer levels of management actively engaging in each particular procurement episode, the structure of the buying centre tends to be flattened. For instance, when a low-ranking user logs on to a procurement application, the employee's profile contains the pre-authorizations necessary, such as approved multi-vendor catalogues, product types and expenditure levels. It means that individuals can move swiftly through vendor selection and product purchase without involving senior managers.

## **Functional level**

The automation of procurement tasks that e-procurement applications provide tend to streamline the buying centre by reducing the number and type of job functions that are actively involved in the procurement process. Technical details, performance metrics, regulatory requirements, and other key facets of raw material can be archived by using intranet procurement applications. The buying centre members are thereafter able to query such information directly through online databases, without involving personnel from product planning, engineering or production. Hence, e-procurement applications lower procurement cycle times and reduces the functional range of employees directly involved in procurement episodes.

## **Participation**

The degree of participation from each buying centre member is important to study since it is suggested to affect the level of influence projected on other members.

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### **Participation**

The degree of participation from each buying centre member is important to study since it is suggested to affect the level of influence projected on other members. The participation in the buying centre is defined as the:

"Amount of written or verbal communication offered to others in the decision making unit (DMU) during the course of the purchase decision... ".

Research suggests that the more an employee's position is at stake, the higher is his/her participation degree. The previously suggested overall decrease in the size of the buying centre leads to that the relative weight of each member's responsibility for the purchasing decision increases. It will therefore enhance the probability of bearing personal

consequences for the decision. Further, e-procurement allows much more information to be accessed and exchanged among members. Members can participate in online discussions without leaving their offices, which encourages both more frequent and longer discussions.

### **The buying centre processes**

Other than changes to the structure, research suggests that buying centre processes, i.e. the attitudinal and behavioural facets of member interactions, also are changing. Especially the influence of technical personnel and the conflicts and coordination within the DMU are affected by e-procurement applications.

### **Influence of technical personnel**

Buying centres often include technical personnel such as engineers, technicians and system experts. Their ability to influence buying decisions is substantial in buying centres responsible for major capital purchases, materials and component parts. It is due to their high degree of technical knowledge and expert power. Further, industrial buyers are likely to use e-business tools to obtain highly technical information about products. The information is maybe only understood by the technicians in the buying centre. Thereby technical personnel are likely to increase their influence over the buying decision.

### **Conflict**

Conflicts often arise in buying centres because of divergent objectives, task interdependence and incompatible management styles and approaches. It is damaging to performance and causes mistrust, misunderstanding and anxiety. The main contributor to conflict is a communication barrier between departments.

Electronic business tools can increase the inter-departmental communication. The risk for conflicts is then lowered because the increased communication and access to additional information allows similar understandings of goals, wider access to documents and fewer opportunities to suspect hidden agendas and information batching by individual buying centre members. It builds understanding across the various departmental perspectives.

## **Coordination**

Interaction patterns and activities within the buying centre are complex and their interdependencies are embedded in the overall organisational network of communications. For instance, when purchasing a piece of complex machinery an engineering member may be in charge for checking technical specifications, an accounting member may be responsible for calculating costs and depreciation schedules etc. These tasks are not performed simultaneously. Relevant information is often processed through communication dyads of only two members. The coordination among all members is therefore a difficult task. The advantage of a many-to-many communication interface is that it allows members to communicate better. All members of the buying centre have the possibility to post, view and track inputs of others on the company's Web site, which bring less confusion and a higher degree of clarity regarding scheduling and evaluation. An accountant can check order updates made by an engineer in real time and update cost projections accordingly.

## **Impact on outcomes**

Adoption of e-procurement applications opens the possibility to increase both efficiency and effectiveness. To be effective is to produce a desired result, while efficiency is to function effectively with little waste of effort.

E-business tools reduce transaction costs between organisations by facilitating communication and enabling tasks to be completed more rapidly. The conversion of paper documents for ordering, invoicing and tracking into electronic documents lowers expenses associated with accounting, record keeping and the various archival tasks. Other benefits include reduced order cycle time and better timeliness in ordering and delivery. Order cycle cost reductions occur when Internet-based buying lowers managerial involvement in purchase activities in the number of separate buying tasks that must be carried out. E-business tools offer the opportunity to group tasks such as vendor identification, specification transfer and pricing into a seamless communication stream, lowering time and cost investments.



Streamlining the buying centre (reduced size, hierarchical, and functional levels) along with more informed participation implies faster and more efficient decision-making. Further, highly knowledgeable technical personnel, reduced conflict and better coordination imply better product selection and inventory management.

## **Drivers of integration**

The adoption drivers for integration systems in the procurement process can be divided into three different categories, operational, strategic and external drivers.

### **Operational drivers**

It is suggested that one of the most important benefits of electronic exchange of information between organisations is decreased transaction cost, i.e. inefficiencies in the market that add to the cost of a product or service. These decreased transaction costs are derived from eliminating the need for re-keying data. The result is an improved information flow, i.e. more and better updated information, and therefore also an error reduction. Because the orders are sent directly to the sellers' system and registered automatically, the buyers can benefit from an improved efficiency. The order routines are improved and the paperwork is reduced. Better timeliness in order routines and deliveries as well as receiving timely order confirmations is valuable. Integrated procurement processes can also shorten the lead-time and as a consequence decrease the inventory levels.

Where only order information is shared between partners, the benefits are usually efficiency gains such as lower transaction costs as mentioned above. Vendor managed inventory (VMI) is however another more advanced service opportunity. VMI is a means of optimizing supply chain performance in which the supplier is responsible for maintaining the buyer's inventory levels. The supplier has access to the buyer's inventory data and is responsible for generating purchase orders. The supplier benefits from valuable insights of how the demand of their products is changing over time, which

brings the possibility to set up more correct production schedules. Correct production schedules also bring decreased inventory levels. Insight into demand changes could also remove the bullwhip effect which refers to a scenario where the orders to the supplier tend to have larger fluctuations than sales to the buyer. The buyer on the other hand benefits from reduced administrative costs since less time is spent on placing, managing and following up orders. The buyers also have the possibility to decrease inventory levels. The suppliers' increased responsibilities to have the products available on time allow the buyers to decrease safety stocks and thereby lowering inventory levels.

Electronic billing (e-billing) services is another opportunity. E-billing is an Internet-based payment solution. It enables the posting and presentment of invoices on the Internet and it reduces handling costs. If an electronic billing function is used, it leads to that funds are not tied up in accounts payable or receivable for a long time and that the cash flow is improved.

### **Strategic drivers**

Early applications for Internet-based procurement have concentrated on improving data flow and error reduction. It is now being argued that the greatest value of using integrated systems for procurement will emerge in strategic areas. It is suggested that where companies are able to reap the biggest benefits are from improved competitiveness. The improved competitiveness is possible due to reduced administrative hours. The time saved can be used to provide better levels of customer service. An enhanced image, for instance by being in the technological forefront, as well as improved buyer/supplier relationships due to the increased level of mutual cooperation could also improve the competitiveness.

The improved efficiency mentioned above also allows companies to spend more time on market analysis. As a result they gain a better insight into market changes and get a better understanding of the customers' needs. Companies are therefore able to respond more timely to market changes.

Consolidated purchasing practices can lead to macro benefits for the whole supply chain that then turn into micro improvements for each member. All trading partners are able to reap macro benefits in the form of decreased transaction costs and improved efficiency. The micro improvements that can be derived from the mentioned macro improvements include greater discounts and better service from suppliers.

### **External forces**

Other factors that encourage adoption are pressure from business partners and/or competition. It is argued that especially SME are affected by bargaining power. It was also found that organisations were forced to implement these systems even though they were unable or ready to take advantage of them.

### **Inhibitors to integration**

The inhibitors can be divided into; technical issues, legal issues, business partner relationship issues, cultural issues, human resource management issues and perceived costs and benefits issues.

#### **Technical issues**

The full integration of IOS with an organisation's internal system and with those of its trading partners is however a very difficult task that require enormous resources. This is true due to the incompatibility between IOS software and in-house applications, and the several standards of information and data formats. Companies also have different types of internal systems, which add to the inter-organisational incompatibility. The question is then whether companies have, or can afford, the required competences and resources to link their internal information system to its online procurement system. Research suggests that many companies do not have the required competences. It has even been argued that lack of technical knowledge is one of the largest obstacles when implementing a new application or system. The administration of the integration solution must also be considered. Maintenance includes performance management, disaster recovery, configuration management and security administration.

When sending data between organisations using an electronic link there is an issue of security. A few mouse-clicks and a company's most valuable asset, its information, could be in the hands of a competitor. Message content could be modified, the sequence altered and repudiation of message origin or receipt are possible. These concerns have to be handled in some way. In addition, system stability, error recovery and data backup are concerns for most organisations.

### **Legal issues**

It is hard to regulate e-business for two reasons. First, the scope and technology is changing rapidly. Besides, the formulation of the law has been an evolutionary process, adapting to the needs of the society. Secondly, the nature of the Internet is trans-national. It is therefore a problem to decide which legal system that should be used for the transactions. The development of new kinds of commercial activities in the electronic environment depends on assuring companies of that the use of the network is secure and reliable.

Business partners using an electronic link need to clearly make an agreement on all terms and conditions including shipment, location of delivery, duration of contract, who pays the transaction costs, and the sender's and receiver's obligation if a third party intercepts the message sent.

### **Business relationship issues**

The switching cost involves the cost of switching from one supplier to another. Close collaboration with a specific supplier therefore further increases the switching cost, since a lot of resources have been put into that particular relationship. Another aspect of partner relationships is that distributors may feel that automating the communication process might hurt the business relationship, due the decreased level of personal contacts with the supplier.

### **Cultural issues**

Cultural differences can be seen between countries, industries as well as companies. New technologies such as the Internet provide a platform for human interaction and a medium for cultural, social, commercial and linguistic facets of communication. The enhanced capabilities also present challenges because effective interpersonal communication, knowledge sharing and resource transactions influence the productivity of organisations. Companies working with information technology must therefore consider numerous cultural differences as they implement new technology in new cultural settings. When doing business with foreign countries there is for instance a need for international language and country specific business skills. In national as well as international business there is a need for cultural awareness and sensitivity to how culture affects the adoption of new technologies. Successful implementation of IT-applications cross-culturally is dependant on careful appreciation of prevailing norms and values. Individuals within different cultures define the value of information differently. What is considered useful, meaningful and worth communicating in one culture may not be considered so in another.

Many managers have questioned the value of integration strategies without having a thorough understanding of the integration-financial performance relationship. Managerial knowledge deficiencies influence the performance of the integrated supply chain. Top managers must learn new skills to guide their firms beyond their own strategic core. The effectiveness of any change is dependant on both the environmental and organisational changes that accompany it. Top and middle managements' awareness, understanding and strong support for e-business and IOS play a crucial role in successful integration. The integration affects the whole organisation's interactions with its trading partners, business relationships and the competitive position in the industry. A low level of understanding also leads to a lower level of perceived benefits, which would be an important inhibitor towards adoption.

### **Human resource management issues**

The supply chain is only as strong as its weakest link. It may however not be the actual link, i.e. the IOS, which is the most fragile point in the supply chain. In fact, it may exist within one of the supply chain members. Since the effectiveness of any technology often depends on the time and effort it takes to learn and use it, insufficient training for the

managers or employees can be a critical barrier to successful implementation. In addition, new technology often brings behavioural and organisational changes to the company's culture, value and work practices. When a process changes, the jobs of those that work in the process must be changed as well. Attitudes and beliefs among the employees must be realigned with the new process. These changes could be major inhibitors towards adoption of integration solutions. It is therefore important to make the employees engaged and involved and openly communicate with them to teach them about the new technology and answer their questions. They should not feel threatened and to prevent this they should be informed about the advantages they will receive from the new technology. Employees should be educated on the underlying issues and total costs of ownership.

### **Issues regarding perceived costs and benefits**

As with any project, economic cost is likely to be an important inhibitor to the integration of systems. The costs come from system acquisition and implementation, coordinating and integrating business processes among partners, and translating and integrating data among systems. Particularly among SME there have to be low uncertainty regarding costs. For example, when implementing EDI the initial costs are high. The high amount of transactions that is needed before economic benefits are obtained can be the cause of important concerns.

Many companies aim to include all their suppliers in their online procurement system, but at many times the buyer may only invest in IOS with suppliers that are considered critical for long-term organisational success, i.e. if the relationship is not intense enough or if the number of transactions is not large enough, there could be no need to invest in such systems. Many organisations have also failed to adequately address performance until it is too late. Complex issues such as message rates, transactions per second and interface performance must be considered.

Many companies require very tangible levels of project justification and respond positively to benefits which consider revenue, costs and fixed capital. One of the reasons for low adoption rates of inter-organisational systems, despite high levels of awareness, is the lack of realisation of macro benefits in supply chain improvements. When these macro improvements are realised they turn into micro improvements for each participant in the supply chain.

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# **CHAPTER 4**

# **METHODOLOGY**

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## CHAPTER 4: METHODOLOGY

Classifying business research on the basis of purpose allows us to understand how the nature of the problem influences the choice of research strategies. The nature of the problem will determine whether the research is exploratory, descriptive or causal.

Exploratory studies are used to clarify and define the nature of a problem. They are used to analyse a situation, to gain a better understanding of the dimensions of a problem. The purpose is however not to determine a particular guideline. Exploratory research is instead conducted with the expectation that subsequent research will be required to determine the proper course of action.

Unlike exploratory studies, descriptive research is based on some previous understanding of the nature of the research problem. The purpose of descriptive studies is to describe the characteristics of a complex phenomenon or population. Even though the answer to the question why is never given, descriptive information is in many cases enough to solve business problems.

Causal or explanatory research is often preceded by exploratory and descriptive research. Causal studies refer to research conducted to identify cause-and-effect relationships among variables where the research problem has been defined narrowly.

- Establish the appropriate causal order of events
- Measure the concomitant variation, i.e. the occurrence of two phenomena that vary together, between the presumed cause and effect
- Recognize the presence or absence of alternative reasonable explanations or causal factors

In our study we intended to explore, describe and perhaps also start to explain the distributors' driving and inhibiting factors for integration of the procurement process with their suppliers. Some research has been conducted in this field of research, but not

sufficiently and therefore our study was somewhat exploratory. Our study was however primarily descriptive but also causal to some extent, since we aimed to describe and then perhaps also start to explain our findings from the previous stages.

### **Research approach**

The purpose of the study and the accompanying research questions determines the best approach for a study. Qualitative research focuses on words and observations; stories, visual portrayals, meaningful characterisations, interpretations and other descriptions. The researcher's perception and interpretation comes in focus and any source of information may be informally investigated to clarify which qualities or characteristics that are associated with an object, situation or issue. The purpose of quantitative research on the other hand is to determine the quantity or extent of some phenomenon in the form of numbers that can be analysed statistically. Quantitative research also tends to be more structured than qualitative that on the other hand is more flexible.

Based on our purpose, research questions and the above discussion, the approach that we chose was qualitative. We aimed to describe the distributors' need of integration. We used our emerged frame of reference to try to gain a better understanding of the distributors' driving and inhibiting factors for integration of the procurement process with their suppliers. We were not interested in analysing data statistically as quantitative research implies.

### **Research strategy**

Researchers have five different strategies to chose from, each with its own advantages and drawbacks. The research strategies that have to be considered when conducting a study, which can be seen in TABLE 4:1 below, are according to Yin; experiment, survey, archival analysis, history and case study. Which strategy that is most suitable is dependent on three factors; the form of research question and whether the researcher has control over behavioural and contemporary events. The distinctions between the strategies are however not always clear and sharp. They often overlap each other instead. The objective here is to avoid important misfits.

**Sample selection**

We decided to examine five small and medium sized distributors in the industrial supply sector. The reason why we choose small and medium sized companies was that few cases have examined how they perceive integrating e-business solutions. The reason why we choose to investigate distributors in the industrial supply sector was that integrating e-business solutions is argued to offer them great opportunities but the adoption rate is still low.

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# **CHAPTER 5**

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## **DATA COLLECTED**

## CHAPTER V: DATA COLLECTED

For qualitative research there are six different forms of evidence for data collection. These are documentation, archival records, interviews, direct observations, participant observation and physical artefacts. The strengths and weaknesses of the different sources of evidence are presented in below Table.

Table 1: Six sources of evidence: strengths and weaknesses

Source of evidence	Strengths	Weaknesses
Documentation	<i>Stable</i> : can be reviewed repeatedly <i>Unobtrusive</i> : not created as a result of the case <i>Exact</i> : contains exact names, references and details of an event <i>Broad coverage</i> : long span of time, many events and settings	<i>Retrievability</i> : can be low <i>Reporting bias</i> : reflects (unknown) bias of author <i>Access</i> : may be deliberately blocked <i>Biased selectivity</i> : if collection is incomplete
Archival Records	(Same as for Documentation) Precise and quantitative	(Same as for Documentation) Accessibility due to privacy reasons
Interviews	<i>Targeted</i> : focuses directly at the case study topic <i>Insightful</i> : provides perceived casual inferences	Bias due to poorly constructed questionnaires Response bias Inaccuracies due to poor recall <i>Reflexibility</i> : interviewee gives what interviewer wants to hear
Direct observations	<i>Reality</i> : covers events in real time <i>Contextual</i> : covers context of event	Time consuming <i>Selectivity</i> : unless broad coverage <i>Reflexivity</i> : event may proceed differently because it is being observed <i>Costs</i> : hours needed by human observers
Participant observation	(Same as for Direct observations) Insightful into interpersonal behaviour and motives	(Same as for Direct observations) Bias due to investigator's manipulation of events
Physical artifacts	Insightful into cultural features and technical operations	Selectivity Availability

There will be an increased strength in the method if several data collection methods are used. This utilization of multiple sources of evidence is referred to as triangulation and makes the study more reliable. We solely used interviews due to that there was hardly

any documentation or physical artefacts available about the driving and inhibiting factors of integration. It was also very hard and time-consuming to obtain this kind of data from any type of observation.

The interview could be divided into two types, structured and focused interviews. The structured interview follows a structured questionnaire is therefore best suited for surveys. The focused interview is better suited for complex subjects since it follows an interview guideline instead and promotes discussion by the respondent. Since we considered our study to be complex we decided to use a focused interview.

There are two different ways of conducting the focused interview, i.e. by telephone interviewing or personal interviewing face-to-face. By comparing our research objectives with the strengths and weaknesses of each of these methods, presented in Table 2, we were able to make a choice on which type that should be used for our respondent.

Table 2: Comparison of survey methods

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Type of interview	Strengths	Weaknesses
Telephone	<ul style="list-style-type: none"> <li>Lower cost than personal interview</li> <li>Expanded geographic coverage without dramatic increase of costs</li> <li>Uses fewer and more highly skilled interviewers</li> <li>Reduced interviewer bias</li> <li>Fastest completion time</li> <li>Better access to hard-to-reach respondents through repeated callbacks</li> </ul>	<ul style="list-style-type: none"> <li>Response rate is lower than for personal interview</li> <li>Interview length must be limited</li> <li>Illustrations can not be used</li> <li>Responses may be less complete</li> </ul>
Personal	<ul style="list-style-type: none"> <li>Interviewers can answer questions about the survey, probe for answers, use follow-up questions and gather information by observation</li> <li>Special visual aids and scoring devices can be used</li> </ul>	<ul style="list-style-type: none"> <li>High costs</li> <li>Need for highly trained interviewers</li> <li>Longer period needed in the field for collecting data</li> <li>Follow-up is labour intensive</li> <li>Not all respondents are accessible or available</li> <li>Some respondents are unwilling to speak to strangers face-to-face</li> <li>Questions may be altered or respondents coached by the interviewers</li> </ul>

To collect the data we decided to make first personal interviews and then follow-up interviews by telephone. The personal interview was chosen due to that it was very important to probe for answers and to explain issues about the topic discussed. It was also important to see the reactions of the respondents when answering or discussing a question, since the uncertainty or security was much easier to see when sitting down face-to-face. The personal interviews took on average two hours and the follow-up telephone interviews about 20 minutes.

# **CHAPTER VI**

# **DATA ANALYSIS**

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## CHAPTER VI: DATA ANALYSIS

The nature of qualitative data brings implications for its analysis. To be able to capture the richness associated with qualitative data they cannot be collected in a standardized way. The transformation of raw data into information requires that the data is disaggregated into meaningful and related categories that then can be rearranged and analysed systematically and thoroughly.

Data analysis consists of three different flows of activity: data reduction, data display and conclusion drawing and verification. Data reduction is a part of analysing the data. It refers to the process of selecting, simplifying and transforming the data that appears on tape or in field notes.

The second flow is the display of data. It is defined as an organised assembly of information that permits conclusion drawing. Narrative text is one way to display the information. However, it is bulky and poorly structured. A better way to display information is through matrices, graphs, networks and charts. Using these tools is a major avenue to qualitative data analysis and they are designed to assemble organised information in an immediately, accessible and compact form.

The third stream of data analysis is conclusion drawing and verification. In this stage the researcher notes regularities, patterns, explanations, possible configurations, causal flows and propositions. By making a multi-case analysis a researcher can establish the range of generality of a finding or explanation and pin down the conditions under which circumstances this finding occur. There is a greater explanatory power and generalisability compared to single case analysis.

We followed all these three steps in our analysis of the collected data. First, the data from each case was reduced in order to display it properly. The data was also verified both

within the cases, by comparing them to the frame of reference, and across the cases, by comparing the cases to each other. During the cross-case analysis data was structured and shown in tables to simplify the comparison. In the compilation of our findings matrices was used to analyse the data and display it in a structured and compact form.

### **Quality standards**

The ideal study should be designed and controlled for accurate measurement of the interesting variables. The design of the research procedures should be carefully planned to come to conclusions that are as objective as possible. The researcher should report, with complete frankness, weaknesses and estimate their effect on the findings. The quality of a scientific study can be evaluated from the validity and reliability concepts.

### **Validity**

Validity refers to "the extent to which a test measures what we actually wish to measure". When conducting a case study there are two concepts of validity that are relevant, external and construct validity.

#### **External validity**

An externally valid study can be generalized across persons, settings and times. Case studies are generalised analytically; results are attempted to be generalised to theories, as opposed to statistically as surveys are. Basically external validity is a sampling question. The question is to what extent the results from the respondents can be transferred to a target population?

#### **Construct validity**

Construct validity refers to the degree to which conclusions can justifiably be made from the operationalisation of the theoretical constructs. It is an assessment of how well the theories are translated into measures. The researcher must make sure that the selected measures do indeed reflect the specific area that is being examined (Yin, 1994).

Since we in our cases left much of the operationalisation to the respondents it was very important that they were knowledgeable. To examine the factors' impact on a decision to integrate with suppliers we chose a four-degree scale, ranging from high impact via medium and low impact to no impact. We did not choose a scale with more levels because it would be hard to differentiate between the factors. Some would probably stand out either positively or negatively but the rest would be hard to separate.

### **Reliability**

Reliability refers to "the accuracy and precision of a measurement procedure" (Thorndike & Hagen, 1969, pp. 5). A measure is considered reliable when similar results are obtained over time and across different situations. The cause of low reliability is therefore imperfections in the measuring process that affect the results differently each time a measure is taken. It was therefore important that we talked to the right person in each interview. Less knowledgeable persons may give different answers at different times to the same question.

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# CHAPTER 7

## FINDINGS

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## CHAPTER VII: FINDINGS

The contribution to theory from this project is based on both theoretical and empirical studies of the research problem. For the empirical studies five specific cases were investigated. Our findings do not completely comply with previous research. We have not found any new drivers or inhibitors, but many factors that have been brought up by earlier research do not affect our population. Our study can therefore serve as a foundation for further research. For instance, strategic improvements are only seen as bonuses and are not affecting the decision in many cases. The reason might be that we are investigating small and medium sized distributors. The investment might be big compared to the available resources. It is therefore very important to know exactly how much that can be saved and strategic improvements are very hard to value. Many strategic drivers also stem from operational improvements. The number of transactions might be too few for small and medium sized distributors to give any important strategic benefits. The Dotcom-crash might also have changed the way people perceive both positive and negative aspects of e-business solutions.

Moving from traditional ordering to integrated electronic ordering bring many changes to the purchasing procedures. The characteristics of the buying centre as well as the processes taking place within it are affected.

Pressure from competition and suppliers are external drivers. Fierce competition forces distributors to increase their efficiency to survive. Pressure from competition is therefore a very important external driver. The pressure that distributors experience from suppliers varies significantly, but to most cases it is only a small driver. Usually the two business partners are looking for a win-win situation where the distributor is not forced to use a certain solution.

# **CHAPTER 8:**

# **RECOMMENDATIONS**

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## **CHAPTER 8: RECOMMENDATIONS**

Improving the skills of procurement personnel, an organisation could achieve a better performance by getting strategic in procurement. Engaging the key suppliers from the design process to cooperatively solving the supply chain predicaments could diminish the wastes of an organisation. The managers should therefore focus on attempts to find out corporate and/or business strategy and understand it so that they can align the strategic procurement with corporate strategy, and demonstrate how procurement management can reply to organizational objectives and goals. Organisations may set up internal classes to teach the essential skills to their employees or may find it necessary to recruit procurement professionals with these skills. The managers can select the key suppliers; establish close relationships with suppliers to make certain efficient and high quality delivery of materials.

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# **CHAPTER 9**

## **CONCLUSION**

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## CHAPTER 9: CONCLUSION

Strategic improvements are seen as bonuses and are not affecting the decision in many cases. The reason might be that we are investigating small and medium sized distributors. The investment might be big compared to the available resources. It is therefore very important to know exactly how much that can be saved and strategic improvements are very hard to value. Many strategic drivers also stem from operational improvements. The number of transactions might be too few for small and medium sized distributors to give any important strategic benefits. The Dotcom-crash might also have changed the way people perceive both positive and negative aspects of e-business solutions.

Finally and probably most important, operational benefits are often better arguments than strategic benefits when discussions are held with prospects. Many organisations also need evidence that the solution works. Case studies that show efficiency improvements in actual numbers would be a strong marketing tool. It is also possible to show concrete numbers of increased timeliness in delivery, both from the supplier and to the end customer.

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# APPENDICES

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## APPENDICES

### APPENDIX 'A'

Dear Friend,

As you know, with Liberalisation and Globalisation our economy is opening up to severe competition both internally and externally. In its wake competitiveness assumes immense importance.

As part of my MBA, I have chosen the project objective as “**Improving Procurement Performance with E-business Mechanisms**” For this, I am interested in getting your valuable responses to the Questionnaire that follow.

All responses to the Questionnaire are to be utilized only for this project and also in an aggregated form. It is not necessary for you to reveal your identity should you desire. However, it is of utmost importance that your responses are frank, forthright and reflect your true opinion. Specifically, I seek your kind co-operation in adhering to the following points:

1. Please give your responses to all Questions / Statements and do not leave any of them blank.
2. Please tick mark (✓) your response in only one of the columns against each Question / Statement.
3. There is no right or wrong responses to the Questions / Statements that follow in the Questionnaire. What is important is your own personal frank and forthright opinion on various aspects.

Yours sincerely,

Signed  
(Student)

## QUESTIONNAIRE

The purchaser puts the orders in the internal order system. The order is then encrypted and sent automatically over the Internet to the supplier in real-time. When the order is registered in the supplier's ERP-system an order confirmation is sent back automatically. It is also possible to receive electronic invoices as well as implement VMI (Vendor Managed Inventory; the supplier has access to information about inventory levels and sales figures and register the order for the distributor).

1. Could you briefly describe your purchasing practises today? How is an order sent?
2. What changes would be brought by the change from your purchasing practises to this type of electronic ordering?
3. How would the total information flow between your company and its suppliers be affected?
4. What effects would be brought by implementing VMI?
5. What effects would be brought by electronic billing services?
6. Could the integration bring any strategic benefits?
7. Are there any macro benefits in the supply chain that could turn into micro improvements for each participant?
8. Are there any external factors that could affect the decision to integrate with suppliers?
9. Could there be any technical obstacles to the integration?
10. Are there any legal issues that affect the decision to integrate with suppliers?
11. Are there any cultural issues affecting the integration?

12. Would the integration require any organisational changes?
13. Would the integration require any behavioural changes?
14. How would your trading partner relationship be affected?
15. How would the decision be affected by management's knowledge and attitude towards IT-solutions?
16. Are there any difficulties to concrete the costs and benefits?
17. Are there any other positive aspects of the integration?
18. Are there any other negative aspects of the integration?

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