

**International Accounting and Finance**

**Master Thesis No 2001:1**

**WHAT RELATIONSHIP SHOULD WE HAVE IN  
INFORMATION AGE?**

**An ABB eProcurement Case**

**Liu Xuan & Su Yirong**

Graduate Business School  
School of Economics and Commercial Law  
Göteborg University  
ISSN 1403-851X  
Printed by Elanders Novum AB

## **Abstract**

Nowadays, Information Technology (IT) is widely exploited in Multinational Enterprises (MNE) and it brings about significant changes in different spheres of business. In logistics management, modern information technology will offer opportunities for fast and safe transmission and processing of extensive amounts of data, both internally for users within the company and externally for suppliers and customers. In supply chain management, such information sharing caused revolutionary changes in relationships among supply chains.

Our study tries to discuss how IT changed the relationships in supply chains. An ABB business unit is used to demonstrate our empirical findings. The result is that IT does not appear to have simply increased firms' reliance on market coordination, but rather to have engendered new forms of organization such as "networks", "virtual organizations". The trend will be that all partners among the supply chain will be integrated as one organization to meet customers' demand and provide best services for them.

**Key words:** IT, Information System, Supply Chain Management, Network, Inter-organizational information sharing.

## Acknowledgements

We would like to thank our thesis tutor Stefan Schiller. We feel very grateful for his helps during our work on this thesis.

Many thanks to our interviewees in ABB Business System AB, Lena G. Karlsson, Monica Gälldin, Andrea Gustafsson, and Bent Erik. Thank you all for taking time to answer our questions.

We are especially grateful to our parents; their love has been with us wherever we are.

Gothenburg, Sweden 2001

Liu Xuan  
Su Yirong

# TABLE OF CONTENTS

<b>CHAPTER 1</b>	<b>INTRODUCTION</b> .....	<b>1</b>
1.1	BACKGROUND .....	1
1.2	THE RESEARCH PROBLEM .....	3
1.3	PURPOSE .....	3
1.4	SCOPE AND LIMITATIONS .....	4
<b>CHAPTER 2</b>	<b>METHOD</b> .....	<b>5</b>
2.1	RESEARCH STRATEGY .....	5
2.2	CASE STUDY .....	5
2.3	CONDUCTING EMPIRICAL STUDY .....	6
2.3.1.	<i>Data Collection</i> .....	7
2.3.1.1	Collection of Primary Data-Interview .....	7
2.3.1.2	Collection of Secondary Data .....	8
2.3.2	<i>Validity and Reliability</i> .....	8
<b>CHAPTER 3</b>	<b>LITERATURE REVIEW</b> .....	<b>11</b>
3.1	IT VS. INFORMATION SYSTEM .....	11
3.2	INTER-ORGANIZATIONAL INFORMATION SYSTEMS (IOIS) .....	12
3.3	THE DRIVEN FORCES FOR INTER-ORGANIZATION INFORMATION SHARING .....	12
3.3.1	<i>The Force of Globalization</i> .....	13
3.3.2	<i>Uncertainty and Bullwhip Effect</i> .....	13
3.3.3	<i>Deficiency</i> .....	14
3.4	SUPPLY CHAIN VS. SUPPLY CHAIN MANAGEMENT .....	14
3.5	IT/IS IN SUPPLY CHAIN MANAGEMENT .....	15
3.6	THE EXTEND OF INFORMATION SHARING .....	16
3.7	SUPPLY CHAIN RELATIONSHIPS .....	17
<b>CHAPTER 4</b>	<b>THE CASE OF ABB</b> .....	<b>20</b>
4.1	IT IN ABB .....	20
4.3	INDUSTRIAL IT .....	21
4.4	SUPPLY CHAIN MANAGEMENT IN ABB .....	25
<b>CHAPTER 5</b>	<b>EMPIRICAL FINDINGS</b> .....	<b>28</b>
<b>CHAPTER 6</b>	<b>CASE ANALYSIS</b> .....	<b>33</b>
6.1	THE DRIVEN FORCES FOR INFORMATION SHARING INTER-ORGANIZATIONS .....	33
6.1.1	<i>The Force of Globalization</i> .....	33
6.1.2	<i>Uncertainty</i> .....	33
6.1.3	<i>Deficiency</i> .....	34
6.2	SCM CHANGES IN ABB .....	36
6.3	IDENTIFY THE RELATIONSHIP CHANGES IN SUPPLY CHAIN IN THE CONTEXT OF INDUSTRIAL IT .....	37
<b>CHAPTER 7</b>	<b>CONCLUSION</b> .....	<b>39</b>
<b>CHAPTER 8</b>	<b>SUGGESTIONS FOR FURTHER RESEARCH</b> .....	<b>41</b>
<b>CHAPTER 9</b>	<b>REFERENCES</b> .....	<b>42</b>

9.1 ARTICLES ..... 42  
9.2 ANNUAL REPORT ..... 42  
9.3 BOOKS ..... 42  
9.4 INTERVIEWS ..... 43  
9.5 WEBSITE ..... 44  
9.6 OTHER REFERENCES ..... 44  
**APPENDIX..... 45**

# CHAPTER 1 INTRODUCTION

## 1.1 Background

Information technology has been adopted to support logistics for many years. Recent developments in technology have brought information to the forefront of resources from which forward-thinking firms can cultivate genuine competitive advantage. The major technology behind improved information flow was the advent of electronic data interchange (EDI). It offers greatly improved information flows and is an extremely important aspect within leading organizations in the fight to decrease lead-times.

Logistics deals with the flow and storage of goods and related information, as defined by the Council of Logistics Management (Lewis and Talatayevsky, 1997).

“The process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements.”

Previously viewed as a classical function involving adversarial relationships between suppliers, customers, and transportation providers, logistics is emerging as a key source of competitive advantage and a leading reason for the emergence of inter-organizational systems.

In the business logistics realm, today’s changing industry dynamics have influenced the design, operation and objectives of supply chain systems by increasing emphasis on: improved customer service levels, reduced cycle time, improved quality of products and services, reduced costs, integrated information technology and process flows, planned and managed movement, and flexibility of product customization to meet customer needs (Cahill and Gophal, 1992).

Dealing with supply chain management, managers often face a problem: no matter how far upstream, all players within the supply chain are working to meet the market place demand. However, in many supply chains only the player closest to the end customer has the luxury of knowing the true demand. Market information notoriously suffers from delay and distortion as it moves through the supply chain. This demands information sharing among organizations of the supply chain; the recent development of IT makes it true. Meanwhile, the nature of information exchange between supply chain partners has evolved from limited information sharing environments to sharing of rich information.

Hence, Information Technology has altered the way companies manage their supply chains, and has resulted in a variety of new inter-organizational logistics management approaches. This inter-organizational form is a consequence of the fact that many partners who are on the supply chain can both gain from sharing information that was previously accessible to only one of them. The result is a new type of relationship within the supply chain. This leads us to the final, and perhaps most difficult and important component of effective supply chain management: supply chain relationships. Without a foundation of effective supply chain organizational relationship, any efforts to manage the flow of information or materials across the supply chain are likely to be unsuccessful (Robert & Ernest L. 2001). In reality, most managers who are involved in a supply chain management initiative emphasize the criticality of developing and maintaining good relationships with the customers and suppliers in the chain.

The ability to communicate electronically between supply chain members is rapidly becoming a requirement for entering into business alliance (Robert B. Handfield & Ernest L. Nichols, 2001). For example, ABB Group developed their own information system concept to cope with the challenging changes in business environment and the demanding of cooperation between their suppliers and customers. In this study, we will give an introduction of Industrial IT and a case study of a project developed by ABB Business System

AB, called eProcurement. Then relating to our research problem, a conclusion of focusing on relationship in supply chain supported by IT will be given.

## 1.2 The Research Problem

IT expansion brings about significant changes in our life. Information systems are widely adopted in many companies to share information internally and externally. In order to truly take advantage of this new technology, we need to understand how it can be used effectively in real organizations. For example, by dramatically reducing the costs of communication and coordination, new information technologies may soon lead us across a threshold where we can create radically new and more flexible kinds of organizations. More and more companies share their information with their customers and suppliers to get more efficiency. Consequently, a new type of relationship between organizations is emerging in this process.

In ABB Group, Industrial IT is a vision, a concept that describes in one term ABB's business model and strategy for the future. It is also a solution – hardware, software and services – that can be integrated into a common platform for the customer's automation, management and sales systems, i.e. the whole supply chain.

In this thesis, our main question is: *in order to increase efficiency, how does information technology (such as ABB's Industrial IT) influence the relationship in the supply chain?*

## 1.3 Purpose

The supply chain partnership is a relationship between two independent members in supply channels. In order to specify objectives and benefits, the suppliers and buyers could establish a network to share information and/or increase the level of information sharing.

In this thesis, we will observe the changes of relationship in the supply chain when companies adopt IT to support information systems in the supply chain management and how this information-sharing influences the relationship in supply chain. Our thesis holds particularly for ABB network related to supply chains in large companies; other similar companies might find some resemblances from the research fruits.

## **1.4 Scope and Limitations**

We limited our scope to the supplier-buyer relationship within the supply chain. Our study is also limited that the companies who have developed their information systems to share inter-organizational information with their suppliers.

As a good example of utilizing the potential power of IT, ABB adopted their Industrial IT into every segment within its supply chain and made a significant success. ABB's practice can be looked upon as an epitome of global companies in the similar industries.

Our empirical findings are based on our literature study and our case study of ABB Business System AB. It is of great importance to work with populations of companies that have similar branch characteristics that works under similar institutional conditions, such as Siemens, Volkswagon.

## **CHAPTER 2      METHOD**

There are various research methods for different research problems. Choosing one or several suitable method(s) is very important to get a persuasive research result. In this chapter we discuss methodological issues related to the identified problem.

### **2.1    Research Strategy**

Establishing an overall strategy and detailed tactics for a research project is an important step in the initiation of a master thesis and where possible the rationale for the choices made should be clearly understood. However, the methodology should not, regardless of all other consideration, dominate the research procedure, “one must regard all analytical methodologies or structures...as mere intellectual frameworks and be cautious about their overuse in detail” (Quinn, 1988).

In deciding on a research strategy, there are two approaches to a research work, i.e. theoretical or empirical. (In some fields of study deciding which of these two approaches to choose could be a difficult decision.) Theoretical research requires intensive textual investigation while empirical research in business and management studies requires extensive interaction with people. In this thesis, we will focus on the empirical approach. Simultaneously, a good theoretical background is a prerequisite. First we will review the literature, documents regarding to logistics and information systems as much as possible, trying to get a theoretical foundation. Based on this academic foundation, we focus on taking the empirical approach to make a description of how companies operate in practice when they deal with the issues of information systems and the supply chain relationship. Taking this approach, we will make several interviews with persons in ABB Business System AB.

### **2.2    Case Study**

Yin (1989) states that:

“The philosophy behind the case study is that sometimes only by looking carefully at a practical real-life instance can a full picture be obtained of the actual interaction of variables or events. In research the case study has two distinct features. Firstly, the case study can be used in establishing valid and reliable evidence. Secondly, the case study can be used as a vehicle for creating a story or narrative descriptions of the situation being studied, in such a way that the resulting narrative represents a research finding in its own right and thus can be said to have added something of value to the body of knowledge.” (Remeny, et al 1999)

A case study from a research strategy point of view may be defined as an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between phenomenon and the context are not clearly evident, and in which multiple sources of evidence are used. It is particularly valuable in answering who, why and how question in management research.

In this context, we find that the case study is a good approach in our research. As information technology and information system are relatively new phenomena in business environments, most companies explore their own ways to answer WHY and HOW they utilize this technology to customize the changes in their supply chain. Being famous for its Industrial IT, ABB is in the leading position among the companies that successfully utilize IT power in their supply chain. Our study objective is to explore the relation between Inter-organizational information systems and the supply chain relationship. We will give a general overview in Chapter 3, Literature Review, as regards other researcher’s findings on the relationship changes by utilizing IT in the supply chain.

### **2.3 Conducting Empirical Study**

This thesis is a qualitative study, and this research method’s primary strengths are flexibility and the way it helps the investigator to develop an enhanced understanding of the studied phenomenon.

### **2.3.1. Data Collection**

Data collection can rely on many sources of evidence. According to Yin, there are six important sources are: documentation archival records, interviews, direct observation, participant-observation, and physical artifacts (Yin, 1994). There are two types of data generally: primary data and secondary data. Primary data are collected by the researchers for the direct purpose of the investigation, and secondary data consists of the example statistics not generated for the immediate study at hand but for some other purposes (Churchill, 1995). We will have both types of data collection in our thesis.

#### ***2.3.1.1 Collection of Primary Data-Interview***

One of the most important sources of case study information is the interview, and interviews are also essential sources of case study information (Yin, 1994). An inquiring mind is a major prerequisite during data collection, not just before or after the activity. A commonly required skill of persons working with a case study is the ability to ask good questions and to interpret the answers. In addition, a person should be a good “listener” and not be trapped by his or her own ideologies or preconceptions (Yin, 1994).

Most commonly, case study interviews are of an open-ended nature, in which you can ask key respondents for the facts of a matter as well as for the respondents’ opinions about events. Overall, interviews are an essential source of case study evidence because most case studies are about human affairs. These human affairs should be reported and interpreted through the eyes of specific interviewees, and well-informed respondents can provide important insights into a situation (Yin, 1994). Because of our research problem, we consider that the viewpoint of “relationship within the supply chain” could be diversified from company to company, even from person to person within the same company. For this reason, we chose to interview several persons in different positions in ABB Business System AB. In our case analysis of ABB Business system, we have four interviewees, they are: Monica Gälldin, leader of eProcurement; Andrea Gustafsson, consultant of eBusiness; Lena G.

Karlsson, Supply side eBusiness Manager, and Bent Erik, Consultant of eBusiness in ABB Business System. We prepared a list of open-ended questions. When we analyze the viewpoints of interviewees, in order to reach an objective conclusion, we have to consider their positions in their organization hierarchy, and their responsibilities in the company, etc.

### **2.3.1.2      *Collection of Secondary Data***

Due to the limited time and information we got from the interviews, an extensive amount of secondary data is collected. There is another reason for us to pay more attention to secondary data, that is, before we make the interview at ABB Business System AB, the foundational concepts of Information System and Supply Chain should be well understood.

When doing the work of collection of secondary data, we searched as much as possible as regards to Information System and supply chain that we could find in library (including the digital library, i.e. databases, e-journals) and from Internet, and we also acquired a CD and brochures from ABB headquarter that are relevant to Industrial IT.

### **2.3.2    Validity and Reliability**

A research design is the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of a study. In most elementary sense, the design is the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusion (Yin, 1994). A research design is supposed to represent a logical set of statements, judging the quality of any given design according to certain logical tests is necessary. A case study investigator also must maximize four aspects of the quality of any design. Figure 2.1 illustrate the four tests

Figure 2.1: Case study tactics for four design tests (Yin, 1994):

Test	Case study tactic	Phase of research in which tactic occurs
<b>Construct validity</b>	<ul style="list-style-type: none"> <li>• Use of multiple sources of evidence</li> <li>• Establish chain of evidence</li> <li>• Have key information review draft case study report</li> </ul>	<ul style="list-style-type: none"> <li>⇒ Data collection</li> <li>⇒ Data collection</li> <li>⇒ Composition</li> </ul>
<b>Internal validity</b>	<ul style="list-style-type: none"> <li>• Do pattern-matching</li> <li>• Do explanation-building</li> <li>• Do time-series analysis</li> </ul>	<ul style="list-style-type: none"> <li>⇒ Data analysis</li> <li>⇒ Data analysis</li> <li>⇒ Data analysis</li> </ul>
<b>External validity</b>	<ul style="list-style-type: none"> <li>• Use replication logic in multiple-case studies</li> </ul>	<ul style="list-style-type: none"> <li>⇒ Research design</li> </ul>
<b>Reliability</b>	<ul style="list-style-type: none"> <li>• Use case study protocol</li> <li>• Develop case study data base</li> </ul>	<ul style="list-style-type: none"> <li>⇒ Data collection</li> <li>⇒ Data collection</li> </ul>

From the above, we learned that in the phase of research design, we should pay attention to external validity, that is, the research must have the replication logic: if multiple-case studies were performed, the logic should be same in every cases and the conclusion should be possible to generalize. In the process of data analysis, internal validity refers to the logic between theory and findings. For case study analysis, one of the most desirable strategies is to use a pattern matching logic. Such logic compares an empirically based pattern with a predicted one (or with several alternative predictions). If the patterns coincide, the results can help a case study strengthen its internal validity (Yin, 1994).

The reliability concerns that if a later investigator followed exactly the same procedure as described by an earlier investigator and conducted the same case study all over again, the same findings and conclusions should be same (*ibid*).

To achieve high validity and reliability, we reviewed a vast array of literatures, articles, textbooks, journals, company report, etc. Then we try to link and systemize the information together with the facts what really happened and are really happening in company. Aiming at the research problem of “relationship changes”, we ask the interviewees directly. Thanks to the good arrangement of the company’s manager, we got the professional answers from specific person in the company. In addition, we took the tape recorder and recorded all of our conversations during the interview. Meanwhile, we read the annual report of ABB, and the reading materials they recommended, and then we found coinciding results.

## **CHAPTER 3      LITERATURE REVIEW**

In this part, a general theoretical framework will be given. This is done to give the readers a basic outline of our research problem. We attempt to clarify the definitions of the terms that may occur in our thesis, and then we give a background to our research problems.

### **3.1 IT vs. Information System**

We are living through the advent of an important innovation, Information Technology (IT), it is not surprising, despite its relatively short historical tenure, that we have already identified several “waves” or “eras” of IT application or usage in organization (Cash, et al. 1998). Definitely, in logistics management, modern information technology will offer opportunities for the fast and safe transmission and processing of extensive amounts of data, both internally for users within the company and externally for suppliers and customers.

Today, information systems are computerized. Recent developments in technology have brought information to the forefront of resources from which forward-thinking firms can cultivate genuine competitive advantage (Robert B. H. and Ernest L. N. Jr., 1999). The proliferation of new telecommunications and computer technology has made real-time, on-line communications throughout the entire supply chain a reality. That means that organizations are moving towards a new concept known as E-commerce (Electronic Commerce), in which transactions can be made via variety of electronic media, including EDI (Electronic Data Interchange), EFT (Electronic funds transfer), email, and a variety of others.

In our thesis, we will investigate ABB’s Information System known as Industrial IT. Furthermore, as a part of an embedded system, the “eProcurement” project developed by ABB Business System AB will be more focused.

## **3.2 Inter-organizational Information Systems (IOIS)**

IOIS are “systems based on information technologies that cross organizational boundaries.” A more detailed description from Barrett (1987) is “an IOIS as an integrated data-processing/data-communication system utilized by two or more separate organizations. These organizations may (buyer-supplier) or may not (credit clearinghouse) have a preexisting business relationship.” The foundation of this ability to share information is the effective use of IT within the supply chain. Appropriate application of these technologies provides decision makers within timely access to all required information from any location within the supply chain. Because our research problem directly relates to IOIS, the following text will give a brief background.

## **3.3 The Driven Forces for Inter-Organization Information Sharing**

Facing the challenging business environment and fast-developing information technology, no firm is an island. And also, the increase in the complexity in many products and services means that no firm however well endowed can do it all and it makes sense to collaborate and build on complementary strengths. There is a recognition that networks may not simply be one and of the traditional spectrum between doing everything in-house (vertical integration) and of outsourcing everything to suppliers. In view of both modes having their advantages and disadvantages, it is possible to argue for a third way which builds on the theory of systems and that networks have emergent properties where the whole is greater than the sum of the parts. (Joe Tidd, 2001). On the other hand, resource dependence and agency theory are more commonly used to explain vertical integration with suppliers. Closer links between firms, their suppliers and customers may help to reduce the cost of components, through specialization and sharing information on costs. However, factors such as the selection of suppliers and users, timing and mode of their involvement, the novelty and complexity of the system being developed may reduce or negate the benefit of close supplier-user links.

On the other hand, modern supply chain management encompasses the planning, directing, and controlling of the flow of products, services, and information from a firm's suppliers' suppliers to its customers' customers, through intermediaries such as distributors and retailers, this shows that information is playing a very important role in this context. This coordination aspect addresses the role of shared information that enables the analysis and management of all supply chain activities. Based on our understanding of a large amount of articles related to Information System, IOIS, and supply chain, we summarize the following driven forces of IOIS.

### **3.3.1 The Force of Globalization**

Globalization of business has been accelerating in the last two decades. Industry dynamics have influenced the design, operation and objectives of supply chain systems by increasing emphasis on: improved customer service levels, reduced cycle time, improved quality of products and services, reduced costs, integrated information technology and process flows, planned and managed movement, and flexibility of product customization to meet customer needs. Facing the force of globalization, traditional production distribution schemes have been dramatically changed to match these pressures (Yu, et al, 2001).

### **3.3.2 Uncertainty and Bullwhip Effect**

In traditional logistics studies, a supply chain is often considered as a multi-site inventory system. There are three distinct sources of uncertainty that affect a supply chain: suppliers, manufacturers, and customers. In this context, uncertainties are caused by delayed deliveries, machine breakdowns, order fluctuations, etc. An important empirical observation shows that in supply chain practices the variability of an upstream member's demand is greater than that of the downstream member. This effect was found by logistics executives at Procter & Gamble and called the "bullwhip effect" (*ibid.*).

To relieve or eliminate this effect, information sharing between members of a supply chain should be increased to reduce uncertainty. Increasing vertical

information sharing using information system especially Electronic Data Interchange (EDI) can greatly improve the performance of supply chain management.

### 3.3.3 Deficiency

Modern organization management theory suggests that decentralizing decision rights is an effective way of managing a large organization. One problem of this decentralized control is: the whole system may not achieve the optimum performance even though each member optimizes its own performance. Every decentralized part of the supply chain can be looked upon as an isolated island of information. Due to this information isolation, a “broken” supply chain will have substantial stock held at one site to enable another site’s stock reduction. This deficiency caused by decentralized control has led to the evolution of partnership relations between buyers and suppliers. Therefore, it is expected that if each member of the supply chain has more information about other members, and treats each other as strategic partners, it would be easier to achieve an optimum performance based on each member’s control policy.

Centralized information can improve a decentralized supply chain’s performance, and different control policies have been studied under an environment of information cooperation (*Ibid.*).

From the above, we conclude that: Inter-organizational information systems (IOIS) have the advantage of reducing uncertainty by extending the reach of managerial control. With greater volumes of timely and accurate information, decision makers may operate with lower level of ambiguity and uncertainty, enabling them to make more efficient and effective decisions. Thousands of electronic data interchange (EDI) exchanges have been implemented to reduce logistic costs and times, and have met with documented success.

## 3.4 Supply Chain vs. Supply Chain Management

As defined in Dictionary of Business, Supply Chain is “A series of linked stages in a supply network along which a particular set of goods or services

flows.” A supply chain involves raw material providers selling to component and subassembly manufacturers, who sell to final assembly manufacturers, who distribute their products “downstream” through wholesalers, distributors, dealers and retailers to the final customers. This distribution channel or “outbound logistics” (Porter, 1985) may include multiple links along the way. At the same time, a firm would manage the interaction process with its upstream suppliers or inbound logistics which may include hundreds or thousands of firms along several links in the supply chain. A primary objective of traditional logistic management was the minimization of “the total cost of transportation, warehousing, inventory, order processing and information systems” (Stock and Lambert, 1987).

Whereas, Supply Chain Management (SCM) “is the integration of business process from end users through original suppliers that provides products, services, and information that add value for customers” (Lambert, et al., 1998). SCM is a relatively new term that has grown significantly in use and popularity since the late 1980s. Supply Chain Management is the management of all key business processes across members of the supply chain. While SCM represents a relatively new way of approaching business and different views exists regarding the processes involved, the key processes typically would include: customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, procurement, and product development and commercialization (Lambert, et al., 1998). We can see that SCM is highly complex and interactive, and requires simultaneous consideration of many trade-offs.

### **3.5 IT/IS in Supply Chain Management**

As said above, Supply Chain Management is so complicated that its initiatives are unlikely to succeed without the appropriate information systems and the technology required to support them. The information system and IT utilized in supply chain represent one of the fundamental elements that “link” the organizations of a supply chain, say, Inter-organizational and Intra-organizational linkages.

A key notion in the essential nature of information system in the development and maintenance of successful supply chains is the need for virtually seamless bonds within and between organizations. This means creating intra-organizational processes and links to facilitate delivery of seamless information between marketing, sales, purchasing finance, manufacturing, distribution and transportation internally, as well as inter-organizationally, to customers, suppliers, carriers, and retailers across the supply chain.

Our study here focuses on the integrated supply chain, especially buyer-supplier collaborative relationship, and the changes in relationships of buyer/supplier IT brings about.

### **3.6 The Extent of Information Sharing**

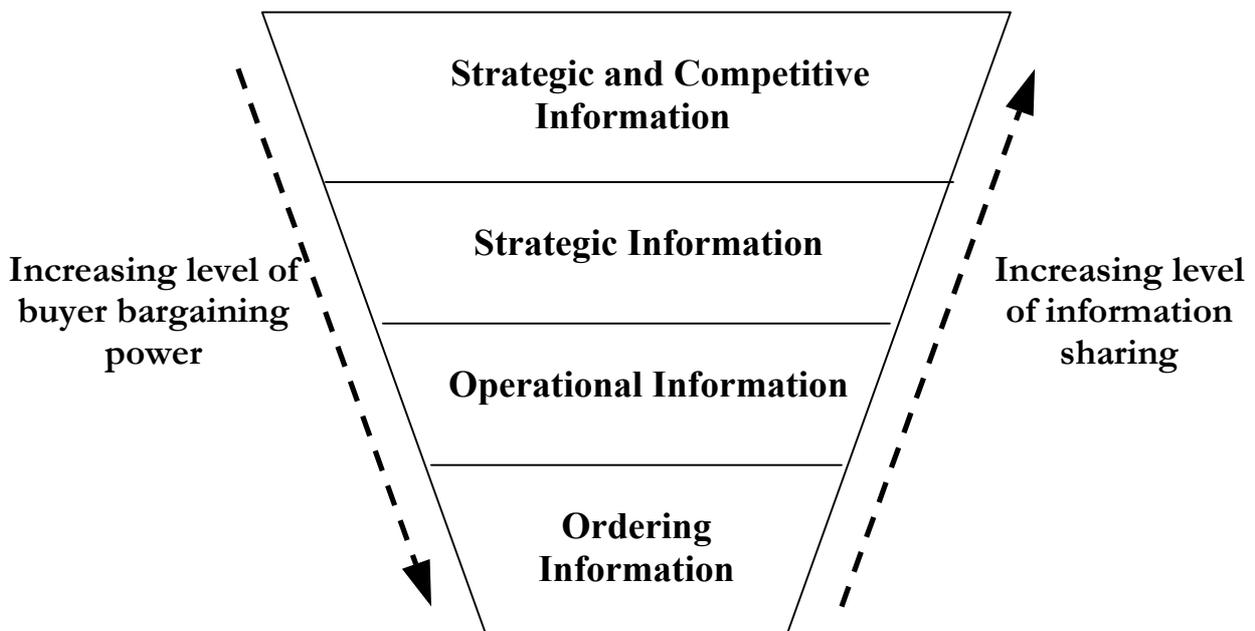
Another issue is how the value generated is divided. As we said above, the buyer will lose the power of bargaining as increasing the level of information sharing. In many cases, a supplier may get tremendous performance improvement if permitted to access specific information. On the other hand, to a buyer, such information will not create as significant benefits as the supplier does. In a case like this, a contract form is expected to ensure such information sharing continuously. Surely, this win-win contract would specify the forms of value distribution by the both parties.

When information is shared, an important strategic issue is the level of information sharing. We treat the level of information shared not based on what its exact content is, but rather, based on the impact of on the relative parties. We identify four different levels of information sharing in an inter-organization as shown in following figure.

From the figure 3.1 (Seidmann & Sundararajan, 1998), when two organizations on the supply chain first start sharing information, the owner of the information (say buyers) will choose to share the information that 1) creates the most value for the buyer and 2) reduces the buyer's relative bargaining power the least. As the parties move to higher levels of information, the marginal value from sharing such information will tend to reduce, and buyer bargaining power will

decrease as well, it can be considered as cost increasing. At some point, the cost of sharing additional information will outweigh the benefits, and this is the point at which the buyer will stop.

Figure 3.1 Level of information sharing (Kemerer, 1998)



We identify four different levels of information sharing between organizations; the first level involves superior exchange of transaction level information (like order quantities and prices) through EDI and related technology. The second level involves sharing select operational information (such as inventory levels) in order to exploit superior expertise across organizational boundaries, and possibly to further improve efficiency. At the third level, the information shared has strategic value to the party that receives the information. Finally, at the highest level, the information adds both strategic and competitive value to the party that receives it.

### 3.7 Supply Chain Relationships

Nearly all organizations are part of one or more supply chains. We have already shown that the supply chain can be looked upon as a network of relationships among trading partners. Successful Supply chain management

requires a change from managing individual functions to integrating activities into key supply chain processes. Traditionally, both upstream and downstream portions of the supply chain have interacted as disconnected entities that receive sporadic flows of information over time (Lambert, Stock & Ellram, 1998).

Until recently, however, organizations focused primarily on their direct customers and internal functions, and placed relatively little emphasis on other organizations within their supply chain network (Handfield & Nichols, 2001). The recent information revolution and global competition drew the management's attention. A trend of the emergence of the integrated supply chain approach is getting more and more obvious.

Supply chain relationships are often described in terms of the level of integration, interconnectedness, or interdependence among the trading partners within the chain (Cooper et al., 1997). For example, to identify four levels of supply chain relationships, progressing on a continuum from lower to higher degrees of partnership. At the lowest level of partnership, the trading partners rely on what Tyndall et al (1998) calls open market negotiations. There are arm's length transactional business practices that structure and control the interactions of trading partners. Under open-market negotiations, market structure and competitive imperatives, not management initiatives, determine the nature of the relationships within the supply chain. The primary role of management is to ensure that the firm has the capacity to meet the transactional requirements of its trading partners.

In the next level of partnership, according to Tyndall et al. (1998), trading partners formalize their cooperation. They deliberately depart from open-market transactional patterns and construct specialized transactional processes that better serve their needs. To secure the benefits of these specialized interactions, trading partners often enter into long-term business contracts, and, to further reduce the uncertainty in their business relationships, they commit to sharing information about the volume and timing of product and service flows among them. Such exchanges of information broaden and intensify as the partnership moves from cooperation to coordination.

In this third level of partnership, the trading partners create relationships rich enough to support joint efforts to simplify supply chain operations. Coordinated efforts to reduce inventories within the supply chain by deploying JIT or to reduce transaction costs by exchanging information electronically are typical of these relationships.

Finally, by the time trading partners reach the collaboration stage of partnership, they will have attained a large measure of integration. They engage in joint efforts to develop and improve products and in joint efforts to enhance the value and satisfaction provided to customers. Consequently, the management devotes considerable energy to building trusting supply chain relationships and to negotiating equitable arrangements for sharing the burdens and rewards of supply chain improvement.

In this thesis, we will study ABB's eProcurement system and to find out which level of the relationship between ABB and its suppliers are in.

## CHAPTER 4 THE CASE OF ABB

Before we introduce the eProcurement project that was developed by ABB Business System AB, we would like to give an overview of ABB Group, and Industrial IT concepts. As a component of Industrial IT, the eProcurement will be embedded to the whole system.

### 4.1 IT in ABB

ABB is one of the largest industrial, energy and automation companies in the world. There are 160,000 employees around the world, ABB's earnings before interest and taxes (EBIT) rose 23 percent to \$ 1,385 million in 2000. Revenues were six percent lower at \$ 22,967 million. Reported in local currencies to reflect the real underlying development of its businesses, revenues rose two percent. Cash flow from operating activities amounted to \$ 1,022 million.

***“Globalization of business demands global organization, you can't begin to do that without IT... If you don't use IT to connect to your customers, it's like moving in the wrong direction on the escalator.” – Percy Barnevik, Chairman of the board of director***

Information technology (IT) is one of the two major priorities for the future in ABB. Mr. Percy Barnevik played a very important role in setting this priority. He is a computer scientist who wrote his first computer program in the 1960s. IT is clearly a critical success factor for the company now, and in the future. He has said that global companies that are geographically far fluxing and heavily decentralized such as ABB cannot function without comprehensive communication networks and computing power, as can be seen from his words above. Barnevik also says IT is an absolute must in order to have the freedom to operate across a wide spectrum of processes, such as manufacturing, engineering, development and sales.

There is an interesting story regarding IT development in ABB about one ABB manager who joined ABB in 1990 from Siemens. He remembers that:

*Siemens was very automated, and heavily into IT systems-there was a computer on the every desk. Siemens Service was a \$4.8 million organization, and ABB was a \$3.5 million organization, but there was only one PC in the whole organization, and that was a battered old IBM. They had to go through two years of change at a time when IT was accelerating out there. The focus was not on IT at that time. He remember that, when he knew for certain that he was joining ABB, he phoned his new boss to ask him what software they were using so that he could read up on it and familiarized himself with it before he arrived. He heard later that the boss said in some consternation to his secretary 'He's asking about software but I don't like to tell him that we don't have any computers!'*

But after 12 months they were well on their way to getting systems. They said, "as long as it is within budget, go ahead!" Now they have the latest PCs and software.

Today, the company has ten 24-hour customer support centers in different countries, the ABB PC is an enterprise workstation connected to a server anywhere in the world, are the network is coordinated by Corporate IT (a component of Industrial IT.).

### **4.3 Industrial IT**

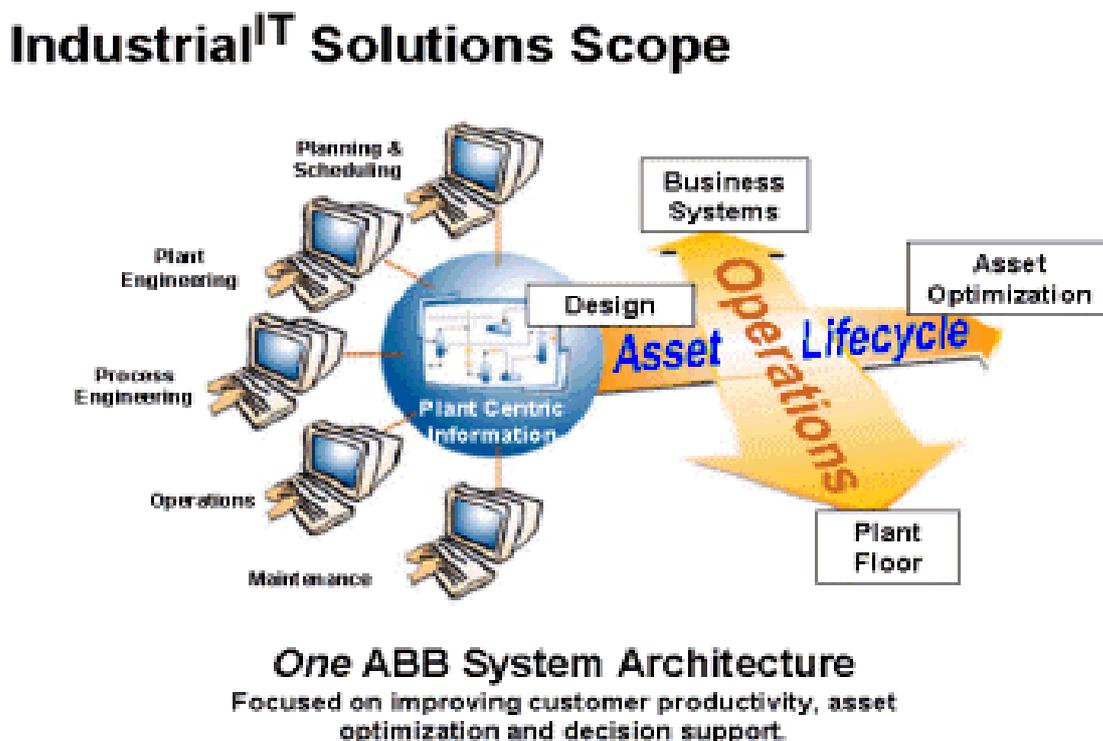
In the process of business globalization, the need for innovation and ingenuity in industry is greater than ever before. Recently, mergers and consolidations have proliferated as companies seek new synergism and strive to obtain greater productivity and efficiency in their operations.

No matter what the sector within the ABB group – utilities, pulp and paper, pharmaceuticals, mining, consumer goods, automotive, shipping or energy recovery and refining – ABB has a solution called Industrial IT. In many respects, Industrial IT is a vision, a concept that describes in one term ABB's business model and strategy for the future. It is also a solution – hardware,

software and services – that can be integrated into a common platform for the customer’s automation, management and sales systems.

To take an example of utilizing Industrial IT in wastewater treatment, StoraEnso, a leading newsprint company in the world, placed an order worth more than US\$ 4 million to ABB last year for a new wastewater treatment plant at its newsprint mill at Hyltebruk in Sweden. The mill is one of the largest in the world and is located in an environmentally sensitive area adjacent to a river. The solution integrates components from three Industrial IT product families – OperateIT, ControlIT and EngineerIT – into a single system that will provide information on the wastewater plant in real-time to operators and employees at the mill. The OperateIT human interface is a command center for the process operators, giving them a complete overview of the process plant at all times; ControlIT components handle process control and integrate production data with open information systems; and EngineerIT provides user-friendly tools for system design and configuration.

Figure 4.1 ABB Industry IT System Architecture



In the year of 1999, ABB began to develop its Industrial IT concept, and it has profoundly changed the way businesses operate (Figure 4.1). On one level, it is a way to integrate all of a company's business processes – supply, production, control, management, sales and distribution – into a single system that can be accessed and controlled in real-time onsite or via the Internet. It provides structured information to managers who need to make decisions now, not at the end of the month.

A comprehensive suite of Industrial IT software solutions was launched at the beginning of 2000, strengthening ABB's portfolio of compatible Industrial IT "building blocks". The resulting systems help customers integrate all the business processes of a company, such as production, control, management, sales and logistics. They will also help link a company with its customers and suppliers in a seamless web of real-time communication.

ABB reacted to this lesson by acknowledging that real-time business information must be shared to succeed. Executives in the boardroom, operators on the plant floor, and every living soul in between must see how their decisions and actions fit into the bigger picture. Today, ABB has nearly 100,000 employees worldwide linked in real time through a secure decision support system that blends inter-office communications, corporate reference, policies and standards, and current events for all to share.

The aim is to fuel growth by making it easier for customers to do business with ABB, and for ABB to meet the rapidly changing needs of its customers faster and more efficiently. This is a pioneering move, making ABB the first in its industry to rebuild itself from the outside in. Customer focus becomes more than an approach to business – it is the organizing principle on which the entire company is built, from the key account manager all the way to the top. It will allow ABB to deliver its complete offering of Industrial IT-compatible products and solutions to all of its customers and, in turn, achieve greater growth.

Alongside this change, ABB is embarking on a mission to exploit information technology and the Internet. They are creating a single Industrial IT

architecture for their entire range of technologies and products – Web-enabling them to speed up collaboration with customers. Industrial IT also allows ABB to form online communities along the whole value chain. This is called collaborative commerce – providing technologies, primarily software-oriented, to facilitate common business processes – from suppliers through manufacturing units to end customers. There are two significant characters of Industrial IT:

- **Plug-and-produce industrial systems**

One of ABB's goals is to have all its offerings Industrial IT-enabled. The new designation is a guarantee that each product can be integrated with other Industrial IT-enabled products on a plug-and-produce basis to form an Industrial IT solution. ABB's growing portfolio of Industrial IT building blocks ensures that all the components for new enterprise systems are compatible and available from one source.

- **Industrial IT across the entire value chain**

Earlier in the year, ABB launched a series of software systems that cover the entire value chain and that link up to form a seamless whole integrating the manufacturer with suppliers and customers. These systems range from design and engineering to procurement, production and order fulfillment. Each system is part of the ABB Industrial IT concept and bears the "IT" mark in its name. They are open and compatible with all major standards and can be accessed and controlled via the Internet. The company launched a family of software products as part of its Industrial IT strategy, aimed at integrating all of a company's processes into a single real-time information system, as well as linking companies with their suppliers and customers into a network of collaborative commerce.

But that is just the beginning. Industrial IT is also a way to link the company with its suppliers and customers to form a seamless web of real-time communication in which information essential to their relations with one another is exchanged freely and immediately. It creates a kind of community of

purpose that allows them to achieve an entirely new level of partnership and collaboration along the whole value chain.

In ABB's Annual Report of 2000, Mr. Jouko Karvinen, Head of ABB's Automation segment, stated that, "long-term commitment to sustainable development is a driving force in our shift towards knowledge-based activities in automation and Industrial IT – activities that make our customers much more efficient." It shows that developing Industrial IT will enjoy the high priority in ABB in the long run. We believe the future Industrial IT could have better performance.

#### **4.4 Supply Chain Management in ABB**

As ABB's suppliers, they can easily share information with ABB. A website called "supplying to ABB" was built for present and potential suppliers to be able to communicate with ABB online. In other words, the suppliers will find information relative to both what ABB expects from them and what the suppliers can expect from ABB.

Nowadays, ABB is developing and deploying eBusiness solutions to improve their overall efficiency and responsiveness throughout the supply chain. As they stated, "Continuous development and improvement of eBusiness solutions is the key for ABB in order to shape new, more efficient business models and support common supply chain management processes throughout our global enterprise." ([www.abb.com](http://www.abb.com)) eBusiness solutions and common processes enable ABB to be more responsive to customers and more competitive in the marketplace.

ABB is focusing on eBusiness solutions to enable real time communications and workflow both internally and externally for a faster, more efficient linkage between the suppliers and the customers. Similar to other companies' SCM, ABB has two systems connected with their suppliers and customers respectively.

- **ABB internal SCM**

By utilizing Web-based and Lotus Notes based solutions, ABB has developed and deployed real time networking and communications capabilities across its entire global SCM organization. This capability enables all their SCM organizations to act as a 'virtual' organization sharing data and knowledge in support of ABB's overall SCM initiatives.

- **ABB external supplier collaboration**

New eBusiness tools enable ABB to maintain its position as a world-class customer and a highly responsive organization. By increasing the transparency with suppliers, they claim that they are becoming easier to do business with and their entire supply chain is becoming more efficient and competitive.

Today, ABB has developed and deployed three information systems in SCM, i.e. eProcurement, Product data warehouse, and Supplier Information Management On-line (SIMON). Based on the information published online, we give a short introduction of these three systems.

- **Supplier Collaboration**

ABB has developed and deployed its first business-to-business (B2B) solution for supplier collaboration. This tool is currently in use by ABB Vetco Gray, an ABB Oil & Gas Segment company. This Supplier Information Management On-line (SIMON) system provides a Web based purchasing and collaborative product commerce solution directly linked to all product information. Its features include on-line requests for quote, data exchange, and purchase order generation that significantly improve the efficiency of the overall supply management process.

The Internet capability enables suppliers' direct access to drawings, bills of material and technical specifications. This application is currently being expanded to other ABB companies.

- **Product Data Warehouse**

ABB's product data warehouse capability simultaneously enables product and solution responsible organizations to use one common channel to publish on-line all relevant technical and marketing information. Documents can be automatically transferred from different document management systems to the product data warehouse, which guarantees that the latest documentation is immediately updated to the Library. All information is then easily available via a Web browser for use by all ABB employees, in sales, engineering, projects or service throughout ABB's global organization. The information is also available to selected distributors and OEMs.

This product data warehouse can also easily be connected to both ABB internal and external systems and different marketplaces. This document publishing system allows ABB to share the latest product documentation with distributors and OEMs in a fast and efficient way providing significant benefits both to publishers and to users of information.

- **eProcurement ---Indirect Material**

ABB has developed and deployed a Web-based solution for the purchasing of indirect materials and services. This interactive marketplace contains catalogs for the electronic procurement of items such as Maintenance, Repair and Operations (MRO), IT hardware and software, Marketing and Advertisement supplies and services and office supplies.

## CHAPTER 5      EMPIRICAL FINDINGS

In our empirical study, we separate ETB (Easy To Buy) project from others; as an important component of eProcurement, an interview focused on ETB was taken. (The interview questionnaires can be found in Appendix). The following text is based on our interview results. eProcurement, this business-to-business (B2B) solution enables ABB and its suppliers to handle the complete order-to-payment process for indirect materials electronically and results in significant process improvements and cost savings for ABB and its suppliers.

As mentioned in Chapter 4, eProcurement is a web-based solution for purchasing indirect materials in ABB. ETB is a critical component of eProcurement, and also, ETB is belonged to Industrial IT. In ABB, indirect material spends nearly 900 M\$ or 7% of total ABB expenditure (see Figure 5.1), thus this material is not the priority for the sourcing organization, but instead the focus lies on the production or project material.

However almost all ABB companies, regardless of activity area, have a need for similar indirect material and thus by aggregating on group level the individual indirect material commodities become very important.

Figure 5.1 Indirect Material Procurement In ABB per year.

<b>Commodity</b>	<b>Spend Vol. (MUSD)</b>
IT	354
Maintenance Repair Operations	322
Office Support	207
<b>Total</b>	<b>883</b>

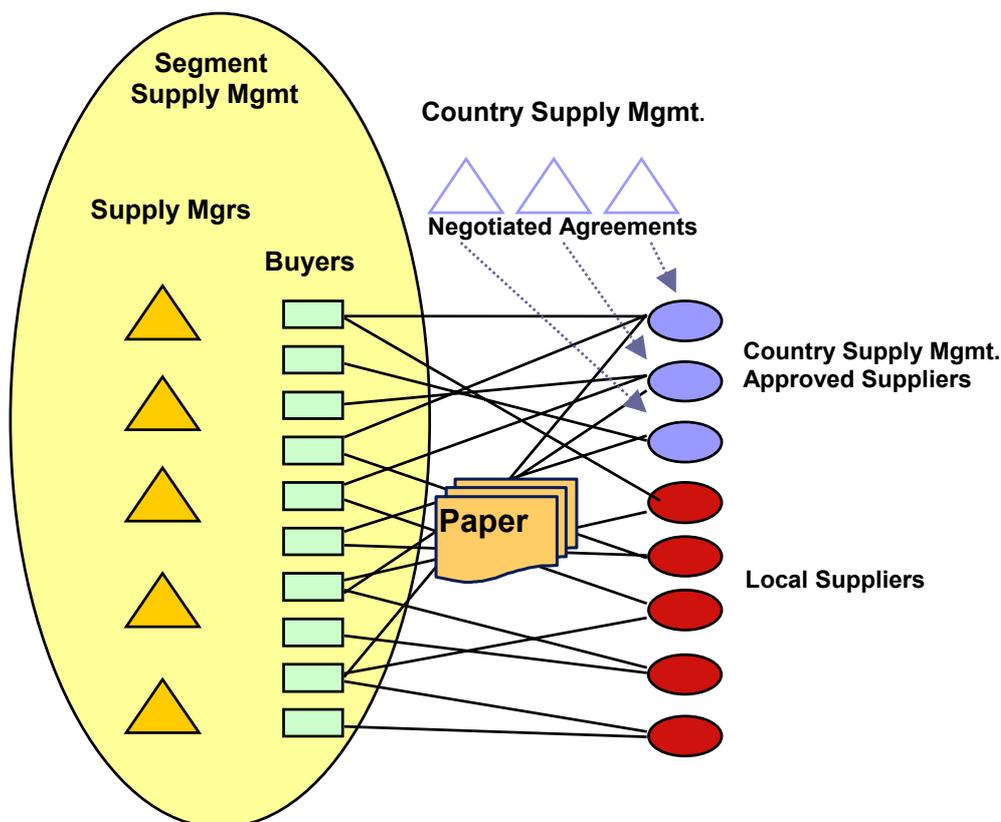
As a global company, efficient procurement is not an easy thing. Before ABB develop their eProcurement, they were facing many problems, they conclude the main factors may influence the effective supply chain:

- *Limited management focus and use of group leverage.*
- *Large numbers of local suppliers.*

- *Data not readily available on indirect material spend.*
- *Local, ad hoc purchasing processes (manual).*
- *Widely varying approval processes from company to company.*

Back then; the supply management is decentralized. Local companies in ABB operated purchasing indirect materials in ABB; each company had their policy in supply management and own suppliers. Therefore a lot of orders for indirect material are also placed via fax or phone in which leads to a paper intense process with little control. And also, the transactions were isolated from other companies. Even though the individual company might have the optimized supply chain management, in the whole for the ABB Group, it is definitely not an optimum one. The complexity can be illustrated by Figure 5.2.

Figure 5.2 Former ABB Indirect Material Purchasing



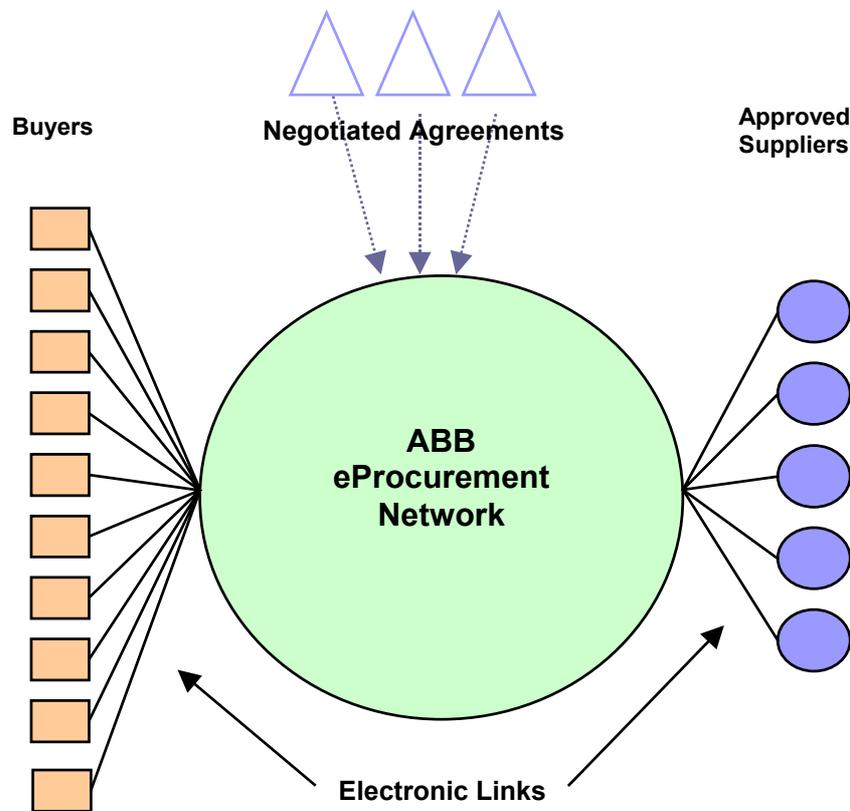
Nowadays, facing the above problems in procurement, ETB has the solution by:

- *Single point of leverage for indirect material spending.*
- *Reduced number of leveraged suppliers by country/region.*
- *Single source of data for indirect material spending.*
- *Single global, automated purchasing process.*

As regards information technology, they developed the user-friendly eProcurement system that integrates with their ERP Systems. Their application pays more attention to supplier connection. Considering only several large companies have EDI systems that can exchange information with ABB, the suppliers who do not have EDI systems can use ABB's Web-EDI, a solution was developed by IBM. In which, they can retrieve what ABB are going to buy, and also, they can make transaction online like marketplace and send/receive orders and invoices electronically.

ABB integrated their procurement into a single sourcing organization to utilize the leverage of the group to negotiate the best possible pricing. The organization will be built up around the three commodity groups: IT, MRO and Office Support. (See Figure 5.3)

Figure 5.3 Today's ABB Indirect Material Purchasing



By changing the system, the number of suppliers will be reduced; on the other hand, the supplier relationship will receive more attention. These suppliers will not be acting on a local basis but on regional or global basis. Actually, a lot of suppliers are former suppliers to ABB, as the consultant in ABB Business System, Andrea Gustavsson said, the ETB system enforced their relationships with suppliers. In many cases, one type of product only is purchased from one supplier. Due to the big quantity of ABB's purchasing, the supplier is keen to the transaction because of such promise.

The catalogues in ETB will be provided and managed on the directives of this organization and only approved suppliers will be available in the system. Through the new eProcurement system all the individual companies in ABB will have direct access to all relevant data for indirect material spent within ABB, which can be used for improving strategies and improving the sourcing.

In this context, ABB will have a global process in which there is highly automated reduction of cost and the non-value added workload.

Control over indirect material transaction will be improved, as all purchases are approved prior to placing the order. This will also reduce the workload in once the invoice is received as no buyer or approver must be traced.

The problem for the ETB system is that they did not get as many users as they expected during their promoting the system, even the users agree that the technical platform and application are excellent. As the team leader working in ABB Business System AB, Monica Gälldin said, “It is somewhat difficult to change the way of thinking, the way of buying. Particularly, the buyers and suppliers have to change their organization in order to utilize the new system well. The process is quite slow.” Andrea Gustafsson, agrees on this point, she also pointed that more and more suppliers realized they had to adopt the system sooner or later, so why not sooner?

Even though ETB is an ongoing project and not operating effectively at this moment, the results of it are significant. As purchasing of indirect material is currently being performed by many people with shared tasks, i.e. very few full-time people, only a portion of the process cost reductions are deemed likely to be realized in short term. Lena G Karlsson, the Manager in ABB Business System concluded that: by using ETB network, 50% of process cost and 5-15% impact costs were saved, the total savings is around \$80 million per year; time spent for each purchase is significantly reduced; ABB can commit to bigger purchasing volumes and thereby reduce the prices. This also results in the number of suppliers declining and more collaborative relationship with suppliers.

## CHAPTER 6 CASE ANALYSIS

### 6.1 The Driven Forces for Information Sharing Inter-Organizations

#### 6.1.1 The Force of Globalization

In the process of internationalization, ABB realize that the traditional customer and supplier relationship in the supply chain is giving a way to unseen electronic transactions. In ABB, we found that there are a large number of local suppliers of indirect materials in different countries before they have the eProcurement system. They have some purchase agreements in country scale, additional to these; they also have local agreements with local suppliers. This situation will face a dilemma; subsidiaries might ignore country scale agreement with suppliers of ABB Group, and purchase indirect materials from other suppliers by their local agreements. In the context of the transactions, they were actually acting as independent companies if they failed to communicate intra-ABB and ABB's other suppliers. As they are purchasing from different suppliers according to various country own local agreements, and have no means of aggregating data other than manually and no available information can be precisely reflected their spend. Thus they are not able to leverage group volumes or make commitments to suppliers in the negotiations. An integrated information system is a requirement to match this pressure.

#### 6.1.2 Uncertainty

Without information sharing, suppliers can only “guess” the demand of their customers; precise estimating of the customers needs sounds impossible. In a large company, such as ABB, sometimes the transactions are in large volume and urgent. From the supplier's point of view, such orders are very difficult to ensure in many cases. In order to eliminate uncertainties, eProcurement system shares the order information with the chosen suppliers; meanwhile, the suppliers' information can be accessed by all companies within ABB Group. Such vertical information sharing improved the performance of ABB's supply chain management significantly.

### **6.1.3 Deficiency**

Decentralizing decision-making rights is highly recommended in modern management. The advantages of decentralized hierarchy are distinctive from centralized one, such as quick response to the needs of market, better control of operations, etc. But, the problem of this decentralized control is: if you look at the entire group supply chain as a whole, the system may not achieve the optimum performance even though each member optimizes its own performance. That is due to every individual subsidiary can be looked upon as an isolated information island. Let us come back to ABB's indirect material purchase situation in the past (Figure 6.1). We cannot say it is an efficient way from the view of ABB Group level. Every local company has their own suppliers and different buying processes from company to company; the most important, and their supply chains with other suppliers are broken.

With the purpose of eliminating this deficiency, an integrated information sharing system supported by IT is expected to change the decentralized supply chain. In ABB, the catalogues in eProcurement will be provided and managed on the directives of the procurement organization and only catalogues of approved suppliers will be available in the system. Today, eProcurement has one standard global process accessed by web browser. All transaction data are standardized, i.e. commodity codes, vendors, approval processes. (Figure 6.2)

Figure 6.1 Former ABB Indirect Material Purchasing

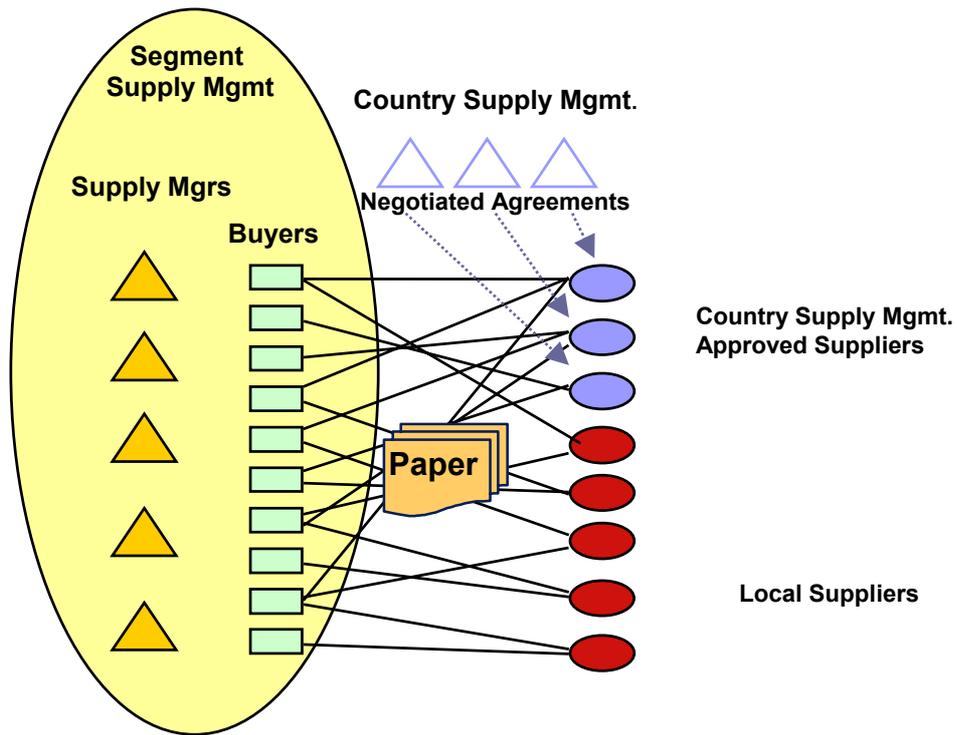
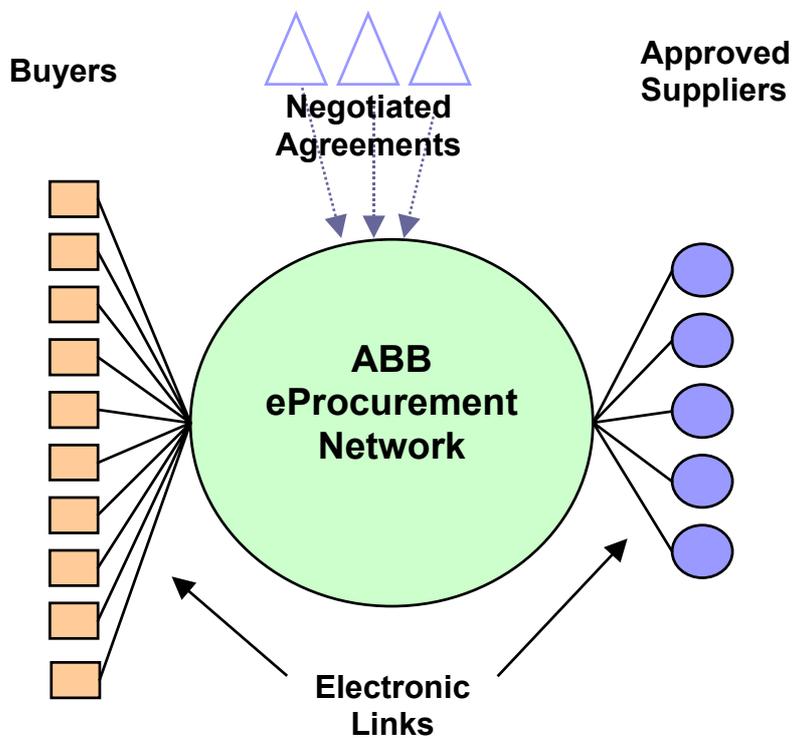


Figure 6.2 ABB Indirect Material Purchasing Today



## 6.2 SCM Changes in ABB

ABB is focusing on eBusiness solutions to enable real time communications and workflow both internally and externally for a faster, more efficient linkage between the suppliers and the customers.

Because of adopting eProcurement, ABB will have a single organization (i.e. Global Purchasing Organization) to use the leverage of the group to negotiate the best possible pricing. (See Figure 6.2) Global Purchasing Organization is responsible for strategies, supplier consolidation, compliance and results measurement, and is then responsible for catalog management, helping suppliers enable to enter the catalogs to share information. Web-based catalogs are also provided and managed by the suppliers in collaboration with ABB's Global Purchasing Organization.

All suppliers have to be approved by this organization before they can access the database of eProcurement system. On the other hand, all subsidiaries in the ABB Group will have no right to make any deals with the supplier who is not in the catalog of the system. Through the new eProcurement system, all local subsidiaries will have direct access to all relevant data for indirect material spending within ABB, which improved their effectiveness and efficiency of procurement.

From ABB's supplier side, after getting the approval from ABB's global purchasing organization, they will not act on a local basis but on a regional or a global basis. Consequently, the number of total suppliers will be significantly reduced. Whenever the supplier has the right to become a member of the catalog database in eProcurement system, it means the supplier can easily take the advantage and win the orders from other subsidiaries in ABB. Even if the competition is very tough at the beginning, the suppliers are keen to participate in the contest for this membership.

The changing management of the supply chain in ABB has a global process which highly automated reducing the cost and non-value added workload. Control over indirect material procurement will improve significantly.

### **6.3 Identify the Relationship Changes in Supply Chain in the Context of Industrial IT**

In the above analysis, we identified the driving forces of establishing an information system platform, for instance eProcurement. And then, we made it clear what are the corresponding changes in the supply chain management that IT brings about. Now, based on the analysis results, we can search out the answer of our research problem, i.e. how can information technology (such as Industrial IT) be used to influence the relationship in the supply chain.

Cooper identified supply chain relationships in terms of the level of integration, interconnectedness, or interdependence among the trading partners within the chain. (Cooper et al., 1997). Tyndall defines four levels of relationship. In the past indirect material transactions in ABB, Tyndall et al. (1998), describes it as an open market; it is the first and lowest level of relationship in the supply chain. A general view of the customer and supplier as an adversary, there is an arm's length relationship between ABB and its suppliers

After the introduction of Industrial IT concept and eProcurement, we found that the utilization of advanced IT changed the traditional relationships in the supply chain. In this eProcurement case, the transaction scenario will be like this: the suppliers and buyers just access the database catalogs and make a deal online. One supplier can sell to all subsidiaries in ABB located in different countries or regions and there is less competition for the supplier compared with the traditional way of marketing.

In this context, ABB view their suppliers as an integral extension of their global enterprise and strive for a transparent and efficient collaboration with best-in-class suppliers from which all their stakeholders benefit – customers, investors, ABB and suppliers. During the interview, when Ms. Lena G. Karlsson was asked, “what do you think the risk in sharing information with suppliers and very few suppliers were selected in eProcurement if the suppliers could take the advantage of the information and increase their bargaining

power position?" I was surprised to hear that they did not take the risk into account. I was told that ABB had the absolute belief in their selected suppliers and took the suppliers as part of their organization.

Also, an increase in the degree of shared information is expected to enhance the cohesiveness between partners by enabling the partners to work in union toward a shared vision. It enables all their SCM organizations to act as a 'virtual' organization sharing data and knowledge in support of ABB's overall SCM initiatives.

All organizations among the supply chain in ABB share the same vision and engage in joint efforts to develop and improve products or services. In addition, Global Purchasing Organization in ABB devotes considerable energy to building close supply chain relationships and to negotiating equitable arrangements for sharing the burdens and rewards of supply chain improvement.

All evidences boil down to a new relationship with suppliers formed in ABB's supply chain. In the light of Tyndall's definition of relationship levels, we categorize this relationship as the highest level, i.e. eProcurement facilitates ABB and its suppliers to reach collaboration stage of partnership; they attain a large measure of integration.

## **CHAPTER 7 CONCLUSION**

The purpose of this thesis is to answer our research problem: How does IT influence the relationships in the supply chain. This chapter will attempt to conclude the results of our study.

Firstly, the driving forces of inter-organization information system in ABB case are: the company's globalizing operation, eliminating uncertainties in supply chain, and increasing efficiency. Facing the global competitors, information sharing in the supply chain should be increased to reduce the uncertainty. Increased vertical information sharing using web-based or EDI systems can enhance performance in both sides of suppliers and buyers. However, the most important target of such information system is cost reduction; ABB eProcurement demonstrates this very well (Bent Erik, ABB).

Secondly, IT changes the traditional supply chain management significantly. Those information systems span the traditional organizational boundaries; the relative organizations among the supply chain have to change their structures in response to the new system. One distinct phenomenon is that the number of suppliers is reduced, rather than increased. For instance, ABB will have fewer suppliers than they ever had before, and they generally purchase just from one or two suppliers around the world. The successful implementation of inter-organizational systems requires the cooperation of a large number of external trading partners. It is also a complex technical endeavor.

Thirdly and most importantly, many of the global manufacturing companies restructured their supply chain to keep track of the development of Information Technology. In the process of procurement, the changes involve: modification of the supplier selection criteria, reduction in the supply base, single sourcing organization, partnering, long-term agreements, mutual training.

At the same time, they also involve developing better relationships and partnerships with the trading partners, i.e. customers and suppliers. New partnership relationships among suppliers, manufactures, retailers and other parties have replaced the conventional free market structure. Although the

supply chain is frequently referred to as the logistic network in the literature, supply chain management emphasizes the overall and long-term benefits of all parties in the chain through cooperation and information sharing. In this context, we should say IT has tremendous organizational impact that IT does not merely appear to have increased firms' reliance on market coordination, but rather to have engendered new forms of organization such as "networks", and "virtual organizations". The trend will be that all partners in supply chain will be integrated as one organization to meet customers' demand and provide the best service for them.

## **CHAPTER 8      SUGGESTIONS FOR FURTHER RESEARCH**

Today, Information Technology is developing fast. The speed is amazing. The problems global companies are facing relate to the usage of IT and how IT will share the whole business process.

There are many interesting issues related to IT and Supply Chain Management. For example, we got the information from interviews in ABB Business System AB that the ABB group is going to extend their eProcurement to direct material. This will make significant changes for the whole ABB Group. In addition, our study is focused on the relationship between supplier and manufacturer, so-called upstream sourcing. It is also interesting to investigate the downstream purchasing relationship i.e. manufacturer and customer.

## CHAPTER 9 REFERENCES

### 9.1 Articles

Cooper, M.C., Ellram, L.M., Gardner, J.T. & Hanks, A.M. (1997), “Meshing Multiple Alliances.”, *Journal of Business Logistics*, Vol. 18 No. 1, pp. 67-89

Barrett S. S., (Winter 1986-1987), “Strategy Alternatives and Inter-organizational System Implementations: An Overview.” *Journal of Management Information System III*, No.3

Yannis Bakos, “Information Links and Electronic Marketplaces: The Role of Inter-Organizational Information Systems in Vertical Markets.” *Journal of Management Information System*, fall 1997, pp.15-34.

Yu, Z. et al. (2001), “Benefits of Information Sharing with Supply Chain Partnerships. *Journal of Industrial Management & Data System* 101/3, pp.114-119

### 9.2 Annual Report

Annual Report of ABB (2000)

### 9.3 Books

Barham, K. & Heimer, C. (1998), *ABB – The Dancing Giant, Creating the globally connected corporation*, London, Financial Times Professional Limited

Cash, J., McFarlan, F. W. & McKenny, J. L. (1998), *Corporate Information System Management: The Issues Facing Senior Management*, Illinois, Dow Jones-Irwin, Homewood.

Chris F. Kemerer (ed), (1998) *Information Technology and Industrial Competitiveness: How IT Shapes Competition*, Amsterdam, Kluwer Academic Publishers.

Churchill G.A., (1995), *Marketing Research Methodological foundations*, Orlando, The Dryden Press.

Lambert, D., Stock, J. & Ellram, L. (1998), *Fundamentals of Logistics Management*, New York, McGraw-Hill Higher Education

Oxford University, *Dictionary of Business*, (1996), Market House Books Ltd

Remeny, D., Williams, B., Money, A. & Swarts, E. (1999), *Doing Research in Business And Management, an Introduction to Process and Method*. London, SAGE Publications

Robert B. H. & Ernest L. N. (2001), *Introduction supply chain management*, London, Prentice Hall International

Seidmann, A. & Sundararajan, A. (1998), *Sharing Logistics Information Across Organizations: Technology, Competition and Contracting*; Kluwer Academic Publishers

Tidd, J., Bessant, J. & Pavitt, K. (2001), *Managing Innovation-Integrating technological, Market, and Organizational Change* ; New York, Johan Wiley & Sons. Ltd.

Tyndall, G., Gopal, C., Partsch, W. & Kamauff, J. (1998), *Supercharging Supply Chains: New Ways to Increase Value Through Global Operational Excellence*, New York, Johon Wiley & Sons, Inc.

Yin R. K., (1994), *Case Study Research-Design and Method*, Beverly Hills, California, Sage, cop.

## 9.4 Interviews

Andrea Gustafsson, Consultant eBusiness, ABB Business Systems AB, Nov 15<sup>th</sup> 2001.

Bengt Erik Ek, eBusiness Business Systems, ABB Group Services Center AB, Nov 15<sup>th</sup> 2001.

Lena G Karlsson, Supply Side eBusiness Manager, ABB Business Systems AB, Nov 15<sup>th</sup> 2001.

Monica Gälldin, Consultant eBusiness, ABB Business System AB, Nov 15<sup>th</sup> 2001.

## **9.5 Website**

[www.abb.com](http://www.abb.com)

## **9.6 Other References**

CD, Industrial IT – The total solutions suite for your enterprise, ABB.

## **Appendix**

### **Interview Questions**

1. Get to know each other
2. General introduction of Industrial IT, history, nowadays, future
  - 2.1 The basic concept / strategy in supply management
  - 2.2 How is the network of supply management performances
  - 2.3 when it is embedded to Industrial IT?
3. Who are your main suppliers?
  - 3.1 Pattern of supplier relationship
  - 3.2 Industry differences
4. The motivation of establishing the network with suppliers: how members are motivated to join/remain in the network.
  - 4.1 Do you have Model / framework / hierarchy to utilize?
5. How the membership in network is defined and maintained ?
  - 5.1 Supplier choosing criteria
  - 5.2 Information flow
  - 5.3 The role of management
6. What do you think: the risks/benefits in sharing information with your suppliers?
  - 6.2 How can you share risks/benefits?
  - 6.1 How to deal with the bargaining power?