Investigating Benefits and Limitations of applying e-procurement in B2B Automakers companies in Iran

Behnam Bahreman
In the Name of God
The Compassionate, The Merciful
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Behnam Bahreman

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1- Introduction

This chapter expresses the background and different aspects of e-procurement within the internet based B2B models in car manufacture Companies. It is started with brief introducing of e-procurement then it moves into the problem discussion and following that, it define the aim of the research and content of the outline of the thesis.

1.1 Background

1.1.1 E-Procurement in B2B Automaker market:

The rise of the Internet and the rapid spread of electronic procurement (EP) across world markets have left few industries unchanged. Since its inception in the early, 1990s e-commerce has been feted by world markets seeking new solutions to business models and dramatic reductions in transaction costs (Timmers, 1998). While initially acclaimed for re-structuring old-world economies and enabling inter-organization collaboration, e-commerce has endured the ignominy of a dotcom crash and has been increasingly criticized for failing to deliver value (Boot & Butler, 2001). This is particularly the case in the auto industry, whose old economy origins, IT legacy systems and complex, hierarchical supply chains mean IS-related transformation is more difficult than, for instance, grocery retailing. Intense competition and slim margins in volume passenger vehicle manufacturing in Europe and N. America has claimed a victim in the resignation of Jack Nasser, Ford CEO and ardent supporter of e-commerce.

The 2000 launch of ‘Covisint’, the biggest and most powerful business-to-business e-marketplace was heralded as the beginning of a ‘new era’ in auto purchasing and supply chain management. Founder members Ford, GM and DaimlerChrysler anticipated significant component price reductions and customer responsiveness by combining economies of scale and Internet technology. However, rival vehicle manufacturers (VMs) and component suppliers were already developing their own solutions and were reluctant to subscribe over fears of accepting a subordinate role. As private trade exchanges, or hubs, proliferated, Covisint’s vision to offer collaborative procurement, lower transaction costs and the introduction of a universal system standard, began to diminish (Kisiel & Whitbread, 2000).
The approval is accomplished online, so significantly cutting the cycle time, and the workflow proceeds through the network. The purchase ordering process is automated and feeds directly into the enterprise’s Enterprise Resource Planning (ERP) system for retention, payables by credit cards or bank payment, and any reconciliation that may be necessary. Financial services (for credit and payment) and logistics services (for pooled shipments and cross-docking) can be accessed online, speeding those processes (Poirier & Bauer, 2000-2001) (Gebauer & Shaw, Success Factors and Impacts of Mobile Business Application: results from a mobile e-procurement study, 2004).

E-procurement begins with the automation of the requisitioning, the approval purchase order management, and accounting processes through an Internet-based protocol (Podlogar, Simplifying Procurement Process by Using E-commerce, 2006).

Today, the modern global automotive industry encompasses the principal manufacturers, General Motors, Ford, Toyota, Honda, Volkswagen, and Daimler Chryslers, all of which operate in a global competitive marketplace. It is suggested that the globalization of the automotive industry, has greatly accelerated during the last half of the 1990's due to the construction of important overseas facilities and establishment of mergers between giant multinational automakers (Hiroaka, 2001).

**1.1.2 Auto Industry in Iran**

**1.1.2.1 History**

Ford was the first car which was imported to Iran from Belgium by Mozaffaredin Shah, one of the Qajar's kings and because it had so many smokes it was named "Smoky Chariot". And from that time (1920) and according to urbanization, the range of cars which were imported increased. Most of the cars which were imported to Iran were from USA and England. The first car which was manufactured in Iran was "Paykan" and after that there were some other naming pickup, minibus and passenger bus. In that year (1967) two cars which were imported from USA and were locally named "Aria" & "Shahin" and were produced by Pars Khodro, the next year in 1968 one French car "Dyane" produced by SAIPA and was offered to Iran market (Iran Yellow Pages, 2010).
Iran General Motors" was named in 1972 for Pars Khodro, which was manufacturing two models of Chevrolet (Opel) 2500 cc and 2800 cc and also three other cars of American General Motors naming "Buick", "Cadillac", "Chevrolet Dyane" which were continued till 1981. In SAIPA the production of "Dyane" stopped in 1980 although the production of "Renault 5" was going on. In these days the productions of some cars like "Pride", "Peugeot 405 & 206" and Mazda can be mentioned. (Iran Yellow Pages, 2010)

As shown in figure 1 and 2, which are extracted from Autofact (2005- Q3), the growth of vehicle assembly and production has been and will be exceptional in the future. In Iran, the most production of automobiles is done by two giant companies which are Iran khodro (about 60% of the whole production in 2003) and SAIPA (about 35% of production in 2003). The import of built up vehicles was banned and so domestic manufacturers used this opportunity for controlling the market, just now importing these vehicles is not as restricted as that time but the import is still low and today some foreign companies mostly European and Asian have started to come to Iran's market in joint ventures and to assemble vehicles imported in CKD (Complete Knock Down) kits. (Autofacts, 2005 Q3)
1.1.2.2 Auto manufacturing Companies in Iran

The companies which are manufacturing automobiles in Iran are: Iran Khodro, SAIPA, Pars Khodro, Raniaran and Zamyad.

1. Iran Khodro Company (Ex-Iran National)
The biggest manufacturer of automobile in Iran which was established on March 19, 1962, and began its operation one year later on March 19, 1963. Iran National Industrial Corporation which after Islamic Revolution is called as Iran Khodro started its work by assembling "Paykan" and after that also produced "Mercedes Benz Bus 302", "Minibus 309" and "Paykan Pick Up." (Iran Yellow Pages, 2010)
Some time later, as the British Talbot Company was closed; Iran Khodro purchased the production line machineries and launched them in Iran. At the same time, it made an agreement with French "Peugeot" for the production of "Peugeot 405" and after some time also produced the nationally optimized "Peugeot RD" and "Hyundai" minibus in 1997 which also lead to the manufacture of "Peugeot Pars" (Persia"), "Peugeot Station", "Peugeot 206", "X7" which is the "National automobile" in June 2001. (Iran Yellow Pages, 2010)

2. SAIPA, Iranian Automotive Company
SAIPA company was established in 1966 and started to manufacture a model of Citroen "Dyane", "pick up" and "Ahu", however, later on, since 1974 the plant
began to assemble "Renault 5" in two different models of 2 & 4 door. Afterwards, since 1982, this company started producing "Nissan Junior", a model of pick up car, powered by 2400 cc engine. Later on, SAIPA initiated assembly of "Renault 21" since 1992 until 1996. Nevertheless, in later developments the company concluded another agreement with Kia Motors Company from South Korea to manufacture "Pride" cars in two hatchback and saloon models. In its future programs, SAIPA is making final arrangements to produce "Citroen Xantia". (Iran Yellow Pages, 2010)

3. Zamyad Company
Zamyad was set up in 1963 to import and assemble truck, pick up and other types of vehicles. In 1972, the company started manufacturing of "Volvo" truck and rear drive "Nissan Junior" pick up, powered by 2000 cc engine. Some years ago, Zamyad managed to obtain the license for manufacture of Italian "IVICO" minibus, however, since 1991 it is engaged in importing CKD parts to assemble "IVICO" trucks. (Iran Yellow Pages, 2010)

4. Topco
Topco was established in 2003 by some of the managers of automotive industry. The most important contract of this company was with Fiat (Italy) regarding producing five models of automobiles with a common platform which was named 178. And that consists of Siena, Palio, Estrada, weekend Aydia. The factory was first established in Saveh and it consisted of producing lines for the Body, Montage and the advance color producing line according to the latest technologies of the world. (TOPCO - About Us, 2010)

5. Sapco
SAPCO was established in 1993 and its mission was the localization of automotive parts and development of IRANKHODRO parts supply chain. Its premier staff was a group of IRONKHODRO employees who worked in Localization Department. Its Field of activity is design engineering and supplying of automotive parts. And the start of its operation was March of 1994. (SAPCO - About Us, 2010)

This company (http://www.pac.ir/) is mostly activating in manufacturing automobiles especially Verna & Avante. This private company was established
in 2004. And this manufacturing company has 500 employees which work there. (PAC - MainPage, 2010)

Also there are and were some other car manufacturing companies in Iran, but the ones we mentioned above are the biggest and the most important ones. Pars Khodro, ShahabKhodro, Iran Khodro Diesel, SAIPA Diesel, Morattab, Kerman Khodro and Raniaran are the ones which were activating for some time and others are also among those car manufacturing companies. (PAC - MainPage, 2010)

1.2 Research problem:

According to Chaffey (2004), the fast technology improvement and its application by business are accomplished by fast changes in terminology. More terms such as e-business, e-marketing, e-commerce and more specialist terms e.g. e-tail, e-procurement, e-CRM are supplying the usage of Electronic Commerce term. (Chaffey, 2004)

Moreover based on Davilla (2003), one of the most important parts of supply chain management is new e-procurement technology. And that the adoption rate will increase as aggressive adaptors share their experience and perception of low risk. Whenever technology transforms from its progress infancy, the real benefits and risks will determine the speed. (Davila, Gupta, & Palmer, 2003, February)

Early adopters have mentioned that the process of buying is going to improve and so they have called it "the magic bullet", although that needs serious and so long-term efforts as well as continuous improvements. (Peoplesoft, 2001)

E-procurement is understood as using some function and services such as catalogue management, requisition, control, approval, receiving, exception processing, financials, payment processing, logistics and supply chain management under web, which gives the permission to the staff of purchasing department for buying goods and services and let the supplier to manage and communicate the fulfillment of purchase submitted to the orders. (Thomson & Singh, 2001, December)

The idea of Fricke et al. (2002) is for setting up electronic procurement needs special software such as catalogue software and hardware in mid-sized enterprises, that is why they can be jointed to electronic processes more easily." (Fricke, Hoppen, Knig, & Pfitzer, 2002)
1.3 Research purpose:

Why this study?

Growth in business-to-business e-commerce remains strong as information and communications technologies (ICTs) continue to transform organizations’ interactions with their suppliers and customers." (Mullaney, 2003, May) (EuropeanCommission:EnterpriseDirectorateGenera, 2005b). For example, in 2004-05 the proportion of Australian businesses placing orders via the Internet continued to increase (33%), growing by 2% from 2003-2004 (31%) (ABS 2006). Supply-side activities such as electronic procurement (e procurement) have been identified as a key area where information systems (IS)-enabled innovations is likely to yield significant benefits for organizations." (EuropeanCommission, 2000, July) (Laub, 2001). Whilst the drivers and potential benefits and transformations of e-procurement are well documented, the ongoing impact of these changes on organizations is less well understood. Most organizations seek to improve procurement processes and reduce procurement costs, however there are other motivations. Adoption profiles and reasons for adoption vary, as do the desired benefits (Williams & Morello, 2004) For example, whilst there are similarities between public and private sector e-procurement contexts in terms of deriving economic value and quality there are significant differences in terms of social welfare implications. (Hardy & Williams, 2005)

According to severe competition of big automakers in the world with Iran auto manufacturers based on free importing of foreign cars into Iran market, on the other hand well established of many managerial systems in well known foreign car brands, Iranian manufacturer should replace ancient with newest one. Moreover, jointing to the WTO which is another target of Iranian automakers makes this situation clear that we have to present new methods. E-procurement will be one of the solutions for improvement competition capability in automotive industry in Iran. This research tried to focuses on:

**Exploring the degree of e-procurement usage and finding benefits and limitations of applying in automotive companies in Iran.**
1.4 Research Questions:

1- To what degree automakers are using e-procurement for obtaining parts or components in Iran?
2- What are the benefits of applying e-procurement for Iranian automakers companies?
3- What are the limitations of applying e-procurement for Iranian automakers companies?

1.5 Concept definition:

By exploring: It is meant to search through or into; to penetrate or range over for discovery; to examine thoroughly. (Definition - Explore (Meaning of Explore), 2009)

By benefits: is meant the advantages and profit that we can achieve through/ by something (Longman, 2007)

By limitations: is meant point at which something ends. (Babylon, 2007)

E-Procurement definition: "E-procurement, based on Chaffey (2004), is electronic communication between buyer and seller for procurement activities via information and communication technology." (Chaffey, 2004)

By procurement process: it is meant a closed loop process that begins with the requisition and ends with the payment (Dai & Kauffman, 2001) (Gebauer, Beam, & Segev, Procurement in the Internet Age, 1998) (Kalakota & Robinson, 2001) (Podlogar, Simplifying Procurement Process by Using E-commerce, 2006) (Shaw, Blanning, Strader, & Whinston, 2000)
2: LITERATURE REVIEW

2.1 E-COMMERCE AND THE INTERNET

Electronic Commerce (EC) and Supply Chain Management (SCM) are fundamental strategic concepts when businesses are forging links with their suppliers and customers. On the evolution from the old to the ‘new economy’, many mature industries are being transformed. This is reflected in the deconstruction of value chains (Evans & Wurster, 1999), the rise of new intermediaries, such as Amazon in book retailing (Hagel & Singer, 1998) (Giaglis, Klein, & O'Keefe, 1999), new business rules (Kelly, 1998), and new requirements to meet customer demand in terms of speed, availability, cost and service. (Rodin & Hartmann, 1999)

Although first EC systems have been developed back in the 1960s (e.g. Videotex, Computer Reservation Systems and Electronic Data Interchange) significant momentum was lacking until the emergence of Internet technologies. Today, EC is omnipresent and attributed considerable economic impact. This is also reflected in the definitions which see EC “as the entire collection of actions that support commercial activities on a network” (Adam & Yesha, 1996) or as „any form of economic activity conducted via electronic connections (Wigand, 1997)“. To identify the main EC processes, a transaction-oriented perspective is widespread in the literature. Transactions link the activities of buyers and sellers and can be broken down into various phases. (Malone, Yates, & Benjamin, 1987) (Schmid & Lindemann, 1998) (Chesher & Kaura, 1998)

- **Information.** At the beginning of a transaction is the identification of vendors and products. Typically, EC encompasses fixed and flexible price transaction scenarios. The former include catalog-based buying from single vendor or multi-vendor catalogs and the latter electronic auctions.

- **Contracting.** Once vendor and product have been determined, negotiation and decision-making concerning a specific product occurs in the contracting phase. Allocation rules are used, e.g. hit-and-take in catalog-based transactions and price-time priority in auction-based transactions.
• *Settlement*. Based on a legal contract, the finalized order is entered and delivery and payment of the selected goods are initiated.

Most EC solutions have evolved to support sales and procurement transactions. Sell-side EC primarily comprises electronic product catalogs which permit browsing through, configuring and ordering of goods from one or more vendors. Well-known systems are from Intershop, Open market or Broad vision. Solutions for buy-side EC (or e-Procurement) are designed to bundle catalogs according to conditions that are pre-negotiated with a supplier. Well known systems are from Ariba, Commerce One or SAP.(Davila, Gupta, & Palmer, 2003, February)

**2.2 PROCUREMENT**

**2.2.1 Procurement Definition**

Procurement includes all activities from obtaining goods and services and their management of its inflow into an organization. The corporate function of procurement traditionally is divided into two tasks: strategic and operational. Strategic task is sourcing activities, supply management, design and implementation of buying procedure, and optional tasks include all transaction-oriented activities like excitement of purchasing orders. (Kauffman, Robinson, & Wang, 1999) (Gebauer & Segev, Changing shapes of supply chains: How the Internet could lead to a more integrated procurement function, 2001)

Procurement which is mostly referred to the purchasing of goods and services for frequently use in operation of a business is one of the most essential parts in organization ability in order to work and function efficiently and effectively. (Leonard, 2000)

All in-bound supply processes are executed by procurement. In many industries the supply lead-time (from procurement to shipment) is greater than the order lead-time. As a consequence raw materials must be ordered based on the forecast. In order to give the suppliers a forecast of what will be procured in the future; procurement forecasts the future purchasing decisions as part of master planning. In practice the following issues related to the supplier forecast are often apparent:
• **Gap between sales forecast and supplier forecast:** Theoretically, the sales forecast is the direct input to the supplier forecast. However, in many companies there are gaps between demand planning and master planning, the latter creating the supplier forecast. These gaps may be due to disconnected information systems or due to communication barriers within the company’s organization (i.e. sales department and procurement department).

• **No feedback to sales about feasibility of the forecast:** In material constrained industries it is very important to get an early feedback from the suppliers whether they can fulfill the forecasted quantities. Especially in an allocation situation, where material is short in the market, the master plan will be constrained by the supply. In this case, sales should receive information about the supply they can expect (see also Chap. 14 about collaborative planning).

• **No clear representation of supplier flexibility:** In order to represent the supply capabilities of a supplier, a “flexibility funnel” can be defined, specifying – per time bucket – the lower bound of the quantities that have to be purchased and the upper bound of the quantities to which the supplier is bound by the terms and conditions of the supplier contract.

• **Accuracy of supplier forecast not being measured:** The supplier forecast accuracy measures the forecasted quantities against the actually procured quantities. The supplier forecast accuracy is a KPI for the procurement processes, as it steers the production of the procured materials at the suppliers’ sites. (Stadtler & Kilger, 2007)

### 2.2.2 The importance of e-procurement

There are many reasons why today purchasing has become so important and just now is playing one of the most important roles in business. The first one is that purchasing is going to encompass more and more parts of the total activity of the company and because of that the purchasing department competence and capacity has very good consequences for efficiency of the company. And as it contains a large volume in the company, it is significant for the company's profitability. (Gadde & Hakansson, 1998)

The second reason is that purchases directly influence the result. One cent that is spent less on purchasing; one cent would be added more to the profit. From times ago there was a notion which was saying: one cent lower price would
cause higher profit, but these two must not be confused with each other as related to the indirect cost associated with purchase. The services and goods must be seen according the function they do, as their function cannot be seen in isolation. (Ibid)

The third reason would be some potential benefits which are derived from having long-term and deeper relation with the supplier which are: flow of material, flow of information and corporation in technical development. (Ibid)

The fourth reason would be the increasing of complexity which purchasing has. As the society develops, the differences become more so the units would become more specialized, the more specialization, more sophisticated products and so the purchasing process would become more difficult. Increase of international purchasing also has led to new difficulties with regard to the distance the buyer and seller has the difference between currencies and also different kinds of legislations. (Ibid)

So it can be concluded that as the companies have turned their concentration to lowering costs and increasing of efficiency, the purchasing is become more important. (Ibid)

2.2.3 Emerging technologies to support procurement

Based on the purpose of the acquired goods, procurement activities are often divided into direct, production-related procurement and indirect, non-production-related procurement. Table 1 summarizes the characteristics of items usually associated with direct vs. indirect procurement. Direct procurement occurs in manufacturing settings only, and then it will encompass all the cases and items which are some part of the finished cost, e.g. raw material, components and parts. Concepts and practices such as material resource planning (MRP), supply chain management and Computer Integrated Manufacturing gained much attention, in particular during the 1980s and as a response to the leadership of Japanese manufacturers over their U.S. and European competitors. Significant efforts in research and management practices resulted in the emergence of innovative methods in logistics, capacity planning, and inventory management as well as sophisticated IT systems to span organizational boundaries supporting replenishment and logistics. They helped firms become flexible enough to respond to constantly changing customer requirements, while still allowing them to stay cost effective, and, thus, to remain competitive in increasingly open markets. Indirect procurement activities concern all items and services that are not directly part of a finished
product. Compared to production-oriented procurement, the picture of indirect is usually much more diverse. Purchasing is often done by non-purchasing experts, as well as by the central purchasing unit. Purchases include a broad variety of items, ranging from “simple” office products to parts for maintenance, repair, and operations (MRO), such as lubricants or spare parts, to complex construction-related items and to various services. Purchases usually occur on an infrequent basis and demand is difficult, if not impossible, to predict. (Gebauer & Segev, Emerging technologies to support indirect procurement: two case studies from the petroleum industry, 2000)

<table>
<thead>
<tr>
<th>Direct vs. indirect procurement items</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct, production-related materials</td>
<td>Indirect, non-production related items and services</td>
</tr>
<tr>
<td>Scheduled</td>
<td>Not scheduled</td>
</tr>
<tr>
<td>Production items</td>
<td>Miscellaneous items</td>
</tr>
<tr>
<td>Usually no shelf items</td>
<td>Usually shelf items</td>
</tr>
<tr>
<td>Inventory accounts</td>
<td>Expense and asset accounts</td>
</tr>
<tr>
<td>Buyers’ desktops only</td>
<td>Everybody’s desktops</td>
</tr>
<tr>
<td>No approvals</td>
<td>Approvals required</td>
</tr>
<tr>
<td>Bill of materials</td>
<td>Aggregated catalogs</td>
</tr>
</tbody>
</table>

Table 1: Direct vs. Indirect procurement
Source: Gebauer and Segev, 2000

2.3 E-PROCUREMENT

2.3.1 Introduction

Simply stated, e-procurement is using internet for convenient buying as a technology solution. It is strong enough to change the purchasing process due to its power to penetrate the whole steps which has been recognized. Here e-procurement is broadly defined to include e-design at the specification development stage of the purchasing process, ending with the supply manager’s efforts to evaluate and rate supplier performance. The clearest indication that businesses grasp, at least intuitively, the benefits of e-procurement is found in
projections for the growth of corporate buying expected to be done on the Internet. For example, the Boston Consulting Group estimates that business-to-business Internet purchases will reach $2 trillion by 2003, up from $92 billion in 1998 (Whyte, 2000, April). Although projections vary, they are generally in this range, demonstrating the inexorable move toward technology-facilitated purchasing as we move deeper into the new millennium.

A discussion may be made that already so many large firms have been applying Electronic Data Interchange for several years, that is why the e-procurement is not a new subject. EDI facilitates mutual transactions of two parties by integrating data bases using a standardized form for purchasing orders and other elements in the purchasing transactions. It is using one special technology known as VAN (Value-Added Network) in order to connect buyer and seller. The implementation of EDI is too expensive, which takes about millions of dollars, although it has improved the traditional way of exchanging of information which was paper-based that allowed the important information related to purchasing be directly forwarded to supplier's system. So, the costs related to implementation are one of the most important barriers for using EDI as one of facilitators for e-procurement. And because of this, in Business-to-business circumstances, just large companies and firms used EDI. The internet-based developments in recent years are a great help for facilitating this expensive technology and this form of e-procurement will become more known to other businesses." (Turban, Lee, King, & Chung, 2000)

As companies strive to provide more value to customer by improving site performance and reducing costs, they are also turning their attention to the procurement process (Monczka, Hand Feild, & Trent, 2001). This process, which serves as the interface between an organization and its suppliers, used to be viewed as having little strategic importance (Pearson, Ellram, & Carter, 1996)/ (Rossler & Hirsz, 1996)/ (Williams, Giunipero, & Henthorne, 1994). Many purchasing departments were viewed as merely “buying” or “shipping” units. In addition, their function was inefficient (Segev & Gebauer, 2001), e.g., nearly 95% of the non-production goods, which account for a third or more of a corporation’s expenditures, are still acquired using paper-based processes (Croom S. R., The Impact of web-based procurement on the management of operating resources supply, 2000). The lack of efficiency is so bad that many companies spend far more on managing the procurement cycle than on the
goods actually purchased (Attaran, 2001); e.g., on average it costs $107 to process a paper-based purchase order with an average cycle time of 7.3 days from order to fulfillment. (Brack, 2000)

IT provides a means to improve the procurement process by providing a digital infrastructure for collaboration. General Electric (GE) in the USA is a company which is realizing benefits by using the Internet. Its trading process network (TPN) is an online business community that allows it to transact over $1 billion worth of business with more than 1400 suppliers around the world. TPN simplifies the old time-consuming contract bidding and award processes. Unlike industry giants, most companies are using off-the-shelf solutions to facilitate their procurement process. Electronic procurement tools are targeted at procurement related activities that enable organizations to integrate processes with suppliers and yield benefits for participants in the value chain. (Aruna, Xinlin, Brown, & Keil, 2006)

Online procurement (e-procurement) has been identified as the ‘... most important element of e-business operational excellence for large corporations’ (Barua, Konana, Whinston, & Yin, 2001). An e-procurement technology is defined as any technology designed to facilitate the acquisition of goods by a commercial or a government organization over the Internet. E-Procurement technologies — including e-Procurement software, B2B (business-to-business) auctions, B2B market exchanges, and purchasing consortia — are focused on automating workflows, consolidating and leveraging organizational spending power, and identifying new sourcing opportunities through the Internet. Future developments are expected to extend these technology models to create collaborative supply chain management tools (Brunnelli, 1999, October)/ (Carabello, 2001). Not surprisingly, e-procurement technologies have been credited with providing significant benefits to companies who venture into them. These advantages include reducing administrative costs, shortening the order fulfillment cycle time, lowering inventory levels and the price paid for goods, and preparing organizations for increased technological collaboration and planning with business partners (Croom S. R., The Impact of web-based procurement on the management of operating resources supply, 2000)/ (Roche, 2001)/ (Gamble, 1999)/ (Grenemeier, 2000, April )/ (Murray, 2001, June). The relevance of these advantages suggested a rapid migration from traditional to e-based procurement models. Accordingly, just a few years back, market analysts predicted that Internet B2B transactions — a subset of e-procurement
technologies — would increase from approximately $600 billion in 2000 to over $6.3 trillion by 2004. (Forrester Research, 2004)

### 2.3.2 Electronic procurement innovation

To improve the procurement process, many organizations have started to use electronic procurement innovations (EPIs); these, when acquired and deployed, change how an organization conducts procurement. Core procurement processes include supplier selection, order placement, order fulfillment, and payment and settlement (Wright, 2000). Each of these processes is supported through EPIs that have been developed for reverse auctions, catalog management, order fulfillment, and payment and settlement (Lee & Whang, 2001). The table below provides the definitions for each of these four EPIs. Traditionally, if a buyer needed some specific product or service, he or she had to investigate, qualify, and negotiate with several potential suppliers before selecting one. To facilitate this process, the online reverse auction was introduced to enable temporal and geographical convenience, reduced cost of contact, instant feedback, and privacy. In electronic reverse auctions, a buyer offers a tender to invited suppliers who bid for the contract at the lowest price, usually in a short time span (hours or minutes). By putting these auctions online, buyers can streamline the process. This creates the potential for savings by stimulating increased competition. Such auctions have increased in popularity, because they emphasize short-term price savings and easy negotiation. They have been found to achieve as much as 5–40% savings (Tully, 2000) with average savings of 15–20% (Cohn, The Hotest net bet yet, 2000). They also drastically reduce the average time from 6 weeks to a few hours. The electronic catalog provides an electronic representation of information about products and/or services offered by an organization (Segev, Wan, & Beam, 1995). In contrast to paper-based catalogs, they can carry an almost unlimited volume of product related information.
Table 2: Definition of Electronic Procurement Innovation

<table>
<thead>
<tr>
<th>Major procurement processes</th>
<th>Electronic procurement innovations</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier selection</td>
<td>Electronic reverse auctions (ERA)</td>
<td>Reverse auctions are the reverse of traditional auctions in which the seller accepts bids from potential buyers. In reverse auctions that are now commonly hosted on websites, a buyer receives bids from several would-be sellers and settles on an offer. Goods are bought and sold, and information is exchanged among buyers and sellers in a private (i.e., hosted by a single company) or public (i.e., with many firms) electronic marketplace.</td>
</tr>
<tr>
<td>Order placement</td>
<td>Electronic catalog management innovations (ECM)</td>
<td>Refers to the generation, maintenance, and presentation of web-based data about products offered by suppliers. Typical data include price, availability, and quality.</td>
</tr>
<tr>
<td>Order fulfillment</td>
<td>Electronic order fulfillment innovations (EOF)</td>
<td>Refers to automation of processes conducted after sale is confirmed. Includes automated ordering, shipping and reordering, and receiving. Allows provision for real-time order tracking and requisition status.</td>
</tr>
<tr>
<td>Payment and settlement</td>
<td>Electronic payment and settlement innovations (EPS)</td>
<td>Provide for issuance of billing, payment and reconciliation of debits, credits and invoices between partners. Also supports product returns and their associated financial impacts.</td>
</tr>
</tbody>
</table>

They are also much easier to maintain; therefore, they usually carry more accurate, real-time product information. Web-based catalogs simplify searches, thus providing easy location and comparison of supplier goods. (Baron, Shaw, & Bailey, 2000) (Yen & NG., 2003). Its use also creates an inter-organizational system that allows organizations to exchange information in an automated, electronic, form. (Choudhury, 1997)

Electronic order fulfillment innovations refer to the automation of processes conducted after a sale. Such innovations provide web-based interaction to customer processes so that buyers, sellers, and logisticians can coordinate their activities. Key processes include picking and shipping of orders, analyzing solutions to ship quantities, and tracking the orders when shipped. Its assimilation enables fast and continuous communication within and between firms, which helps both to avoid lost orders and to find and correct errors. It can also be used to speed delivery by tracking the location of products and the status of orders. (Rae-Smith & Ellinger, 2002). Electronic payment and settlement systems involve the issuing of bills, payment and reconciliation of accounts, and logging of credits and invoices between partners. They also support transactions associated with product returns. Electronic funds transfers are cheaper, safer, and easier to make and track. An electronic payment can be made for less than 2
cents, compared to 43 cents by check. Further, they will prevent check related crimes, including mail theft and forgery. (Glassman & Wells, 1996)

Electronic payments benefit payers by cutting payment processing costs. Payees, on the other hand, have an alternative means to get their payment, which can be deposited directly into their account. In addition, time and cost of reproduction, retrieval, and distribution can be significantly reduced. (Aruna, Xinlin, Brown, & Keil, 2006)

2.3.3 The Purchasing process

"The figure below provides an overview of a typical purchasing. It begins with the need to define buying requirements based on the demands of the firm’s final customer. At this stage, specifications are developed. Early involvement by supply professionals (EPI) and suppliers (ESI) is present, as well as inputs of a cross-functional buying team that may include, in addition to supply and engineering, representatives from operations and marketing. Once the specifications have been developed, a buying team led by the supply manager will prequalify suppliers, generate requests for proposals, evaluate the proposals, and select a supplier based on established selection criteria." (William & Presutti, 2003)

"Contract negotiations result in the terms and conditions of a formal contract. Ordering routines and transaction-processing guidelines are established for all purchases that take place under the umbrella of the negotiated contract. Closing the loop is a supplier evaluation system that assesses supplier performance that provides information to be used as the basis for rating the supplier (e.g., excellent, good, fair, unacceptable). This step in the process is critical for assuring that an effective supplier base is in place, a key contributor to the firm’s competitive position. Much is involved in each step of the purchasing process to assure that effective supply management applies such important concepts as value engineering at the specification development stage, formal supplier selection approaches, effective negotiation strategies, or specific programs that exist for evaluating supplier performance. Those subjects are well
covered in the purchasing and supply management literature and are beyond the scope of this article. The focus here is on the role of e-procurement in the purchasing process and its contribution to value creation.” (William & Presutti, 2003)

2.3.4 What is the e-procurement role in the process of purchasing?

As mentioned earlier, applying internet technology which is now called e-procurement, encompasses all components of the process of purchasing. E-design has been entered to facilitate the supplier involvement in establishing the buying requirements via the process of specification development. Purchaser and supplier can share their information in real time in order to build the specification which will add value to the final product. The communication between purchaser and supplier can help minimizing the complexities and also to avoid the costs which are unnecessary to the specification. So the lowered life cycle of the product and the advantages which will emerge from lowering the time in the market will make the real-time exchanging of the information critical. In addition, the e-design component of a comprehensive e-procurement strategy helps to overcome the silo effect that comes with design activity that is sequential. E-design facilitates real-time collaboration among all internal members of the firm’s cross-functional buying team, as well as with suppliers, preventing the after-the-fact issues in production and purchasing that create the inefficiencies and competitive challenges that arise in the traditional sequential process (for example, a product design that does not facilitate the ease of manufacture or a design that limits the choice of possible suppliers). A good example is Adaptec, a provider of data transfer and communications hardware, which has “substantially reduced design-to-delivery cycle times and saved $10 million in inventory reductions by using Web based collaborative design processes with key suppliers in Hong Kong, Japan, and Taiwan”. (Andeson & Lee, 2002)

The use of the Internet also helps the buying firm in all stages of the supplier selection process, from prequalification of suppliers through the construction of a comprehensive request for proposal to the selection of the final supplier. The application of Internet technology to this step in the purchasing process is known as e-sourcing. For example, Free Markets, a pioneer in on-line sourcing through the reverse auction process, is emerging as a leader in this area of e-procurement. Free Markets possesses expertise in many industrial sectors that
allows them to identify and qualify suppliers that meet the requirements of the
buying firm (Free Markets’ customers). In addition, Free Markets helps the
buying organization develop multi parameter requests for proposal to assure that
the buying company gets the lowest cost buy. The final selection of a source of
supply is the prerogative of the buying company. (AberdeenGroup, e-
procurement: Finally Ready for Prime Time’, 2002)
That decision becomes more comfortable given the extensive work that had
been done in the (William & Presutti, 2003), prequalification and request for
proposal development process mediated by e-sourcing technology. The
attractiveness of this solution for the buying firm is the enormous potential
dividend that emerges when one considers risk versus reward. An e-sourcing
solution such as the one provided by Free Markets costs the buying firm little.
The potential rewards that come from identifying the best and lowest-cost
supplier are significant. (AberdeenGroup, e-procurement: Finally Ready for
Prime Time’, 2002)
Indeed, some of the earliest e-procurement solutions that emerged about 4 years
ago focused on establishing ordering routines that reduced transaction costs
associated with operating resource purchasing (typically maintenance, repair,
and operating supplies [MRO]). One of the leaders in this component of the
purchasing process was Ariba Corporation. Through its technology, the
processing of MRO transactions from a contract established by the buyer with
selected suppliers is completely automated from requisitioning to payment.
Authorized users are provided access to the system from their desktop
computers. Requisitions are generated through the system, approvals are made
electronically, an electronic purchase order is created, and the order is sent
directly to the supplier. It is a “no touch” solution for the supply manager. The
only purchasing department involvement is the upfront value-added step of
negotiating the master contract with the supplier. System suppliers like Ariba
are expanding the application of their Internet solutions to include direct
material purchases, as well as indirect operating resources purchases. (Figgins,
Glovier, Griffith, Sculimbrene, & South, 2001)
The last and final step in the process of purchasing is the evaluation and ratings
which is done by the supplier and needs the performance data to be extensively
accurate. In traditional systems which are paper-based, gathering and
investigating those data to assess them effectively and efficiently is so difficult.
And so the supply manager would draw the firm according the capabilities of
data warehousing which the e-procurement solutions has provided. These
solutions can help to gain the total purchasing via the code of product purchased, also helps to record the most important details related to the performance of the supplier which includes the delivery and also the quality-level of the performance. The tremendous potential of e-procurement has stimulated major enterprise resource planning (ERP) software providers to add e-procurement capabilities to their systems. For example, Oracle Corporation has developed its “procure-to-pay” solution that automates the complete procurement cycle. Its features include spend analysis, strategic sourcing, supplier collaboration, desktop requisitioning, and electronic invoicing and payment. Oracle estimates that its end-to-end procurement solution can save firms 10–20% of total purchasing costs. Similarly, ERP provider SAP offers its my SAP E-procurement solution in a partnership with Commerce One Corporation. Through its integrated analytics feature, my SAP E-procurement provides the buying company with tools to identify sources of supply, compare sources, monitor existing contracts, and evaluate supplier performance. It also includes an automated requisitioning process for MRO buying that is typical of most other e-procurement solutions on the market. Reverse auction capabilities are included among other features. Independent consulting estimates of my SAP E-procurement suggest returns on investment ranging from 240% to 400%. (Figgins, Glovier, Griffith, Sculimbrene, & South, 2001)

2.3.5 The Model of Electronic Procurement

There are many different models for procurement. As these models are changing so rapidly, it is so hard to choose from them. (Chaffey, 2004)

There are 3 prominent models for B2B e-commerce: first: sell-side, second: buy-side and third: marketplace-based. These options are summarized in the below figure which then will be followed by the advantages and disadvantages of each in the given table. (Chaffey, 2004)
The electronic procurement takes place in an electronic marketplace (that is defined as marketplaces that are implemented by using telemetric, that is the goods and services market-typical mechanisms which is supporting transaction's phases. (Schmidt, Electronische Market, 1993). Also it can be taken place in between of two firms and the software which by using internet technologies can automate the process of purchasing. Requisitions may have access to the system through one standard browser in which they are internally or externally connected to the approved catalogues of the company." (De Burca, Fynes, & Marshall, 2005)
### Table 3: Assessment of the procurement model alternative for buyers

<table>
<thead>
<tr>
<th>Procurement model</th>
<th>Advantages to buyer</th>
<th>Disadvantages to buyer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sell-side</strong></td>
<td>• Searching</td>
<td>• Different interface on each site (catalogue and ordering)</td>
</tr>
<tr>
<td>e.g. many catalogue-based B2B</td>
<td>• Onus of maintaining data on supplier</td>
<td>• Restricted choice</td>
</tr>
<tr>
<td>Suppliers such as <a href="http://www.rswww.com">www.rswww.com</a></td>
<td></td>
<td>• Poor integration with ERP/procurement systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Limited purchase control</td>
</tr>
<tr>
<td><strong>Buy-side</strong></td>
<td>• Simplicity-single interface</td>
<td>• Onus of maintaining data is on buyer</td>
</tr>
<tr>
<td>e.g. solutions developed by <a href="http://www.sap.com">www.sap.com</a>, <a href="http://www.arbia.com">www.arbia.com</a>, Covisint and IBM private market place</td>
<td>• Wider choice than sell side</td>
<td>• Software license costs</td>
</tr>
<tr>
<td></td>
<td>• Integration with ERP/procurement systems</td>
<td>• Retraining</td>
</tr>
<tr>
<td></td>
<td>• Good purchase control</td>
<td></td>
</tr>
<tr>
<td><strong>Independent marketplace</strong></td>
<td>• Simplicity-single interface</td>
<td>• Difficult to know which marketplace to choose (horizontal and vertical)</td>
</tr>
<tr>
<td>e.g. <a href="http://www.scquest.com">www.scquest.com</a></td>
<td>• Potentially widest choice of suppliers, products and prices</td>
<td>• Poor purchase controls</td>
</tr>
<tr>
<td><a href="http://www.barclaysb2b.com">www.barclaysb2b.com</a></td>
<td>• Often unified terms and conditions and order forms</td>
<td>• Uncertainty on service levels from unfamiliar suppliers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Interfacing with marketplace data format</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Relatively poor integration with ERP</td>
</tr>
</tbody>
</table>

Source: De Bu’rca, Fynes and Marshall, 2005

#### 2.3.6 Various forms of e-Procurement

Using the definition provided earlier, a large number of forms of EP can be distinguished. Some of these forms have received a lot of attention already and they are by now quite well-defined and relatively well developed. Other forms of EP are still quite young and immature. Some of them will mature; others may never reach that state. We focus on the forms of EP that seem quite well-defined and relatively well developed. These forms could be categorized as follows:

- e-MRO
- web-based ERP
- e-Sourcing
- e-Tendering
- e-Reverse Auctioning
- e-Informing

Both **e-MRO** and **web-based ERP** refer to the process of creating and approving purchasing requisitions, placing purchase orders and receiving goods and services by using a software system based on Internet technology. In the case of e-MRO, the goods and services ordered are maintenance, repair and operating...
(MRO) supplies (i.e., non-product related). The supporting software system (an ordering catalogue system) is used by all employees of an organization. However, in the case of web-based ERP (enterprise resource planning), the goods and services ordered are product related. Usually, only the employees of the purchasing department (or the planning department) are using the supporting software system (the web-based ERP system). (De Boer, Harink, & Heijboer, 2002)

**E-sourcing** refers to the process of identifying new suppliers for a specific category of purchasing requirements using Internet technology (usually the Internet itself). By identifying new suppliers, a purchaser can increase the competitiveness in the tendering process for this purchasing category. E-sourcing is also a way of decreasing the supply risk associated with this purchasing category. For example, new back-up suppliers can be identified more quickly in case the existing supplier fails to deliver and/or a more profound evaluation of the existing set of potential suppliers may be facilitated. (De Boer, Harink, & Heijboer, 2002)

**E-tendering** concerns the process of sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology. Sometimes, e-tendering also includes the analysis and comparison of responses. E-tendering does not include closing the deal with a supplier. It smoothens a large part of the tactical purchasing process without focusing on the specific content of that process. (De Boer, Harink, & Heijboer, 2002)

In practice, an auction enables a supplier to sell goods and services to a number of known or unknown buying organizations. During a relatively short time frame the buying organizations involved submit bids for the goods and services that are auctioned. The auction operates with an upward price mechanism (an English auction with several bids) or a downward price mechanism (a Dutch auction with one bid only). A reversed (English) auction is the opposite: it enables a purchaser to buy goods and services needed from a number of known or unknown suppliers.

**E-reverse auctioning** is the Internet technology based equivalent of reverse auction. Usually, e-reverse auctioning focuses on the price of the goods and services auctioned (Teich, Wallenius, & Wallenius, 1999). In most cases, other
criteria are neglected during the reverse auction. Of course, other criteria can be used in a previous phase in order to determine which suppliers should be invited to join the e-reverse auction. Alternatively, multiple criteria may be used in the auction process itself. (Bichler, 2000)

Unlike the previous forms, e-informing is a form of EP that is not directly associated with a step in the basic purchasing cycle-like contracting or ordering. E-informing is the process of gathering and distributing purchasing information both from and to internal and external parties using Internet technology. For example, publishing purchasing management information on an extranet that can be accessed by internal clients and suppliers is a way of e-informing. (De Boer, Harink, & Heijboer, 2002)

Note that we consider each form of EP as part of a process that is to say a collection of activities that has to be executed by one or more employees. The Internet technology that is needed in these processes can be offered to the employees in several ways via:

- **Electronic (public) market places:** market places are specific websites on the Internet (aimed at, for example, an industry or a commodity) that aim to bring buyers and sellers together in order to facilitate the application of various forms of EP and more general e-commerce (which can be defined as doing business using Internet technology).

- **Intranets:** intranets can be seen as a collection of websites with information and applications that support one or more EP forms. An intranet can only be accessed by employees of an organization. For example, Siemens has an intranet running with a SIS Supplier Information System that is available for employees of Siemens only.

- **Extranets:** extranets can be seen as a collection of websites with information and applications that support one or more EP forms. An extranet can only be accessed by employees of a specified set of organizations. For example, The Purchasing Extranet (managed by WIZNet) enables employees of subscribed organizations to access it." (De Boer, Harink, & Heijboer, 2002)
2.3.7 Adopting an E-procurement System

According to e-Business watch sector Report (July 2003), e-marketplaces has jointed to daily business takes in automotive industry, although there are a number of disappointments online procurement together electronic marketplace. Based on research on procurement in automobile industry, catalogue systems and auctions are improved by the efficiency by using e-procurement. Besides companies found some new subject such as e-sourcing along the supply chain have had an acceptable effects in case of communication and purchasing process quality and increasing the transparency. Contrary to primary expectations, these were more important benefits than direct material cost reduction or the bundling of purchases. (Croom S. R., The Impact of e-business on supply chain management: An Empirical Study of key developments, 2005)

One of the most important electronic revolutions among car manufacturers is done by Ford and General Motors. (Klein & Krcmar, 2005). On November 2, 1999, they announced, they would transfer their purchasing operations to the web for achieving to this target Ford made a joint venture named AutoXchange with Oracle (to connect ford to his own suppliers(material parts)) via net. Also GM with joint of Commerce One for increasing the efficiency of supply chain ran a marketplace to connect suppliers, business partners and customers on a single platform. 20% saving on inventory and procurement for Ford is the result of AutoXchange applying. Microsoft's car point, launched in 1995 joined forces with Ford Direct, a joint venture between Ford Motor Co and its Ford Division Dealer's. Consequently, this innovation stressed on customer side of the automakers operation and it is going to manufacture based on built-to-orders cars. Just now GM connecting with suppliers and also sharing demand and data forecasting is improving the quality of products and also the responsiveness, also reducing the costs. GM forecasts that by 2004, about 68% of the procurement of direct materials to be done over the internet. (Benko & McFarlen, 2003). E-procurement has got off a slow start, although the vendors of such systems, has promised its potentials. One study which is done by (Eyholzer & Hunziker, 2000, 3rd-5th July) has shown that 18 percent of companies in Swiss are using electronic product catalogues, auctions or requests for quotations in procurement and with the results of such study, many companies planned to use e-procurement system. And some of the studies show the same proportions in other companies. (Wyld, 2002, November)
There are other reports that show 50% of American companies are using e-procurement (Croom S. R., The Impact of e-business on supply chain management: An Empirical Study of key developments, 2005). In recent years, the use of e-procurement has increased a lot, but it has emerged some challenges regarding its invent and use. One of the challenges is that the companies only use single e-procurement functions. The other one is that although the evidences show the benefits of e-procurement, old systems e.g. EDI are also available and they use it in e-procurement bases of the company. (Croom S. R., Supply Chain Management in the E-Business Era, An Investigation into supply Chain Strategies, Practices and Progress in E-Business Adoption, 2001)

Covisint, which is a digital marketplace launched by the traditional "Big Three" of Detroit, Renault and Nissan, showed how far the collaboration can extend in industry. The industry is now integrating and eliminating the process of developing point-to-point connections by connecting a system which is based on open standards. Representatives of entire volume network are the members of Covisint. One year later in 2001, GM auctioned around $100 billion via Covisint. (Benko & McFarlen, 2003). And from European suppliers and manufacturers of automotive industry only 23.2% of them use e-procurement." (Fricke, Hoppen, Knig, & Pfitzer, 2002)

Direct products procurement is determined by standards (e.g. xCBL) and special software applications (buy-side solutions) which is needed to access the supplier system (sell-side solutions) and also barriers (for example, permanence of a business relation), but indirect items procurement is much less complex, that is when there is no need any software application and so the purchasing process can be done with a web-browser. And also the indirect procurement is not so much restrictive. Moreover, many steps which were done for e-business procurement with the aim of establishment of industry-wide standards failed. Opposite to what was expected at the beginning, online marketplaces were not accepted by firms functioning in automotive industry. The important reasons are supplier's concerns related to security, the disputes of customers, suppliers and operators of e-marketplaces on power and the preference of carmakers over wide platforms of industry. As a result, electronic marketplaces weren't used in this section much. Many companies used their established suppliers or internet to operate their e-procurement system. (E-BusinessSector, 2005, July). Some
years ago, e-procurement was seen as the solution for the industry cumbersome and the complexity of purchasing process by the managers of automotive industry. Some public marketplaces naming, SupplyOne and Covisint and also other OEM-specific marketplaces to name, Toyota's WARP and VW Group's Supply.com were made with this expectation that a high percent of purchasing of the industry (especially commodities) from such channels would flow. And the e-procurement has been adopted in industry at a very low rate than was expected. The main reason for this low rate is the systems and components are not fitted for online bidding. Actually, the parts which are clearly defined in drawing and specification and that need very little or even no interaction among engineers of supplier and OEM can be emerged via online bidding. And as the IT systems that is using nowadays for purchasing have a little compatibility in online marketplaces, then we will face a considerable danger in the adoption of e-procurement. (Dietz, Nikolaus, & Maurer, 2004)

2.3.8 e-procurement must be considered by whom?

Medium and firms and governmental organizations usually buy their products from some small number of firms which are very good candidates for e-procurement. Many firms use e-procurement in order to control, simplify and automate the product and service purchasing from so many suppliers. The most important thing is to find the best supplier and so the best products at the best time and also with the best price, with being sure enough of the responsiveness and the services they made according to the needs of the business we run. Sometimes one company which currently has its customers finds itself suitable in order to encourage other firms to join them on-line as their business is proven. At the same time, that company which sees its clients are growing decides to capitalize its benefits as its savings and efficiencies has become obvious. As the e-procurement models grow, it will include more than the supplies and goods that are in the office which needs maintenance and repairing. So it will include goods and services which are raw materials, parts and components. There are many ways that sellers and suppliers are taking in order to manage supplier relationships in the process of e-procurement. (EPR, 2010)

There are catalogues and e-procurement products and also those which support the management strategy of supplier-relationships, requiring / needing integration with third party products. Some will look at it from the asset
management point with a shift to maintenance and the operations related to repairing. These schedules and the system of tracking of availability of products and assets have shown the benefits of e-procurement. Some other supply chain sellers provided some more complex systems for manufacturing and assembling. But in real e-procurement which is one of the most important parts of supply chain needs more partners' commitment in management of more sophisticated business-to-business relationships which also needs more technology and capabilities. This needs joining of purchasing process with the information which is in inventory systems, logistics systems and supplier back-end systems and it usually needs customizing. The best e-procurement systems can locate sellers, evaluate the offerings and so make the comparisons among them. It must also require that the best contractual terms are included for the orders. (EPR, 2010).

2.3.9 What it takes to be an e-Procurement Leader

"Aberdeen’s research reveals that the keys to success of e-procurement include:

- **Early process reengineering.** Best performing enterprises examined and “fixed” business processes before applying automated solutions. Slapping an e-procurement solution on an inefficient process will not fix that process.

- **Strong focus on user adoption.** End users will resist change, especially a change that may remove some of their buying power and prevent them from doing business with their “pet” suppliers (which usually are not best-performing or lowest-price suppliers).

- **Involvement of all affected stakeholders in system implementation.** Getting input from all internal groups and all affected suppliers typically speeds system acceptance and minimize simplementation problems. (AberdeenGroup, Best Practices in E-Procurement, 2005)

2.3.10 E-procurement would become a better value by advances

The technologies of e-procurement, the techniques related to implementation and management and also methods of delivery and pricing have been developed
in recent years. The factors that have been illustrated below shows how they can facilitate the value and adoption of e-procurement:

- **The requisition to order basic functionality has been improved**: the function and use of e-procurement have been developed greatly in the past decade. Nowadays, the main requisitioning, approved routing and workflow, also the basic integration and reporting capabilities are to a great deal undifferentiated among competing solutions. Implementing and methods of maintenance have been also developed and now most applications are shipped with pre-defined processes, implementation and report templates which help the speed of system deployed and easing / simplifying the burdens of maintenance.

- **The footprint and category-specific functions have been extended by the providers of the application**: the difference between products is based mainly on the breadth of the product (for example, integrated source to pay, demand aggregation and management) or category / industry- specific functionality (for example, contingent labor, print or life sciences).

- **Supplier networks and hubs of catalogue have reached critical mass**: supplier networks and catalogue hubs have been come to lower the seller's enablement burdens and the ongoing interactions between buyer and seller. At the beginning, the networks were so costly (which was greatly collecting connections and also fees related to transaction) and especially, made the sellers investing in several networks or hubs to keep the relationships of customer. Consequently, these new networks were restricted in value and adoption. In addition, as these are less supplier networks which exists today, many have had reached the "critical mass" which connects many buyers and sellers together, managing many transactions monthly. So it lowers the burdens which exists and also increases the e-procurement value, empowering participants, and connecting them for multiple trading partners' transactions. Some of these suggested some value-added services, like automated invoicing, reconciliation and capabilities of payment.
New pricing and different models of delivering have made the e-procurement be accessible by masses: according to Aberdeen benchmark since 1998 the selling prices of e-procurement licenses have been lowered to 75%. And the fees related to implementation are now less than the first license fees, which makes e-procurement available for medium and also small companies and organizations. This lowered price is somehow attributable to the advent of enterprise resource planning (ERP) sellers as hard competitors. Depreciation of prices have been moved faster according to the new delivery hosted and subscription or the models of payment like pay-as-you-go(on demand) which have been suggested by the new providers of managed service, procurement service providers(PSPs) and the e-procurement providers. Also Aberdeen's 2001 came to this conclusion that hosted solutions suggested great functional improvements to the costs of cycle and license over the applications which were installed and were managed on premise. Aberdeen on its study in this year reaffirmed the hosting's functions of cycle benefits and which that was reported 25% to 30% faster than those implemented on premise. Moreover the fees related to application license and maintenance has decreased in relatively balance of the fees related to hosted solution. Also, enterprises which were using hosted offerings report less full time employees (FTEs) that were given to the ongoing system maintenance. The factors that were mentioned show and improve the availability and increase of the total value and return on investment (ROI) potential regarding e-procurement. (AberdeenGroup, The E-procurement Benchmark Report, 2004)

2.3.11 An example of one of the best Practice Case Studies

Rolls-Royce Uses e-Procurement to Transform Procurement

Business Challenge

Rolls-Royce is a leading producer of power systems for use on land, at sea, and in the air. Rolls-Royce operates in four global markets – civil aerospace, defense aerospace, marine, and energy. The company’s broad customer base includes 500 airlines, 4,000 corporate and utility aircraft and helicopter operators, 160 armed forces, and more than 2,000 marine customers, including
the naval forces of 70 nations. Rolls-Royce currently has a total of 54,000 gas turbines in service. The huge installed customer base generates strong demand for services. Key to the company's business strategy is maximizing revenues from services, which have increased 60% over the past five years and makes up 55% of the company's $10.44 billion in annual sales. Purchasing at Rolls-Royce was tasked with removing all non-value-added purchasing activities and reducing inventory levels. The company needed better visibility into its annual spend of around $100 million for low-value, high-volume indirect goods and services. (AberdeenGroup, Best Practices in E-Procurement, 2005)

It also wanted to consolidate its supplier base, achieve better control of maverick spending, and improve efficiency by reducing the volume of paperwork associated with buying these goods. Prior to 2003, the 120-strong Purchasing group at Rolls-Royce that bought low-value, high-volume indirect goods and services used a manual, paper-based purchasing process. The process was supported by an archaic, internally developed database, was labor-intensive, and prone to errors resulting from manual key entry. The department had essentially become a bottleneck for processing orders, which encouraged unauthorized buying throughout the organization and increases in inventory levels by internal business units to offset the complex ordering process. Spend information was difficult to collect and analyze, and internal customers had a poor perception of the process. (Ibid)

**E-Procurement Strategy**

Rolls-Royce examined solutions that would help purchasing become more strategic in indirect spend. It decided to implement a decentralized industry standard, web-based catalog-ordering system that would allow end users to order commodities online instead of through the purchasing department. (AberdeenGroup, Best Practices in E-Procurement, 2005)

**Solution Selection and Deployment**

"The goal was to remove all non-value-added purchasing activities associated with low-value, high volume buy. The e-procurement system helped achieve this goal by:
• Providing spend and supply information that enabled the supply base to be rationalized from in excess of 5,000 suppliers to less than 100;

• Developing strategic business relationships and close contract management of first-tier Suppliers;

• Implementing an industry-standard consumables catalog order placement system that connected Rolls-Royce requisitioners with suppliers via the Internet;

• Reducing inventory stock value levels; and

• Using procurement cards for supplier payments, with accounting data fed directly into the company’s ERP system.

The e-procurement system is deployed across the entire Rolls-Royce enterprise, and includes all processes from requisition to automated invoicing and payment. A total of 1,700 Rolls-Royce personnel use the system and all suppliers (less than 100) of low-value, high-volume goods and services are enabled. Exostar hosts the system for Rolls-Royce, in an On-Demand delivery model. Suppliers are enabled and catalog content is managed by Exostar via punch-out. Eighty-five percent of the low-value, high-volume indirect spends now goes through the system; this took only 90 days to implement. (AberdeenGroup, Best Practices in E-Procurement, 2005)

Results

The e-procurement implementation has produced a number of quantitative and qualitative benefits, including:

• Reduction in cost of goods of up to 20%;
• Reduction in inventory value levels from $43.5 million to $8.7 million;
• Reduction in errors due to the elimination of manual re-keying of buying data;
• Reduced cycle time, in some cases by up to 80%;
• Near-elimination of paper and fax processes.
• Improved relations with suppliers, who have benefited from reduced transaction costs and improved efficiency." (AberdeenGroup, Best Practices in E-Procurement, 2005)

Lessons Learned

Rolls-Royce learned some valuable lessons during implementation and use of the company’s e-procurement system. Some of the more important lessons were:

• Change management is the single biggest challenge. People naturally resist change, so senior management buy-in and active support is needed to accelerate system adoption by end users. Also, ensuring that the e-procurement system is easy to use will speed acceptance and use.

• Examine and “fix” existing business processes before automating them. Ensure that process development efforts are accepted by all stakeholders. Selection and deployment of technology will be easier if processes are well-defined and made as efficient as possible before automation efforts start.

• Breaking down local cultures is difficult but essential. Enterprise-wide e-procurement will likely result in the elimination of many suppliers that are “local favorites.”

• Engage suppliers, early and often. Selling the benefits of e-procurement to all entities in the supply chain is very important.

• Training and education of end users takes a lot of time and effort. Many enterprises underestimate the time needed to educate both internal users and suppliers. (AberdeenGroup, Best Practices in E-Procurement, 2005)

Future Outlook

The e-procurement system implementation has allowed Rolls-Royce to have more control over its spend, including pricing levels, through process discipline. By reducing waste and creating more efficient processes, the system has
produced a true “lean” procurement process, which is central to Rolls-Royce’s overall business strategy. (AberdeenGroup, Best Practices in E-Procurement, 2005)

Aberdeen Conclusions

By focusing on a particular spend category – low-value, high-volume indirect goods and services – purchasing at Rolls-Royce has successfully reengineered an archaic process to one that has produced various savings and benefits, both internally and with suppliers. The Rolls-Royce example shows that e procurement can produce major benefits relatively quickly, especially in indirect spend. (AberdeenGroup, Best Practices in E-Procurement, 2005)

2.4 E-PROCUREMENT PROCESS

The following 5 steps are going to illustrate the process reengineering, that are strongly connected process simplification, from previous accomplished researches:

1- Awareness of technology opportunities

The literature shows that the process of e-procurement in many firms and organizations with their sellers / vendors has several arrangements. First, these processes have to be reengineered, uniformed, and incorporated to collaborative processes, and which will then enable successful e-procurement and, in turn, giving access to the data in a time when the partners need them. (ActiveMedia, 2000)/ (AthabascaUniversity, 2002, May)/ (Chan & SWATMAN, 1999)/ (EuropeanCommision, 2000, July)/ (Kalakota & Robinson, 2001)/ (Lindemann & Schmid, 1998-99, Winter)/ (Ody, Supply Chain Collaboration, 2001a, December)/ (Ody, Winning Idea Masks Hidden Problems, 2001 b)/ (Podlogar, Hribar, & Gričar, IT use for E-commerce: Chief Information officers statements, 2001)/ (Pucihar, 1999)/ (RIS, 2001, May)/ (Gebauer, Beam, & Segev, Impact of the Internet on Procurement, 1998)/ (Sterle, 2001). Growing technology opportunities, with an emphasis on technology and process complexity and compatibility, are the most important issues in organizing e-
procurement (Chan & Swatman, 1999). Organizations that are healthier in a sense of information technology also have a better organized e-procurement. (Gebauer, Beam, & Segev, Procurement in the Internet Age, 1998)

2- Having power to gain effectiveness of the process

It is important to achieve better control and process tracking of the whole procurement process. (European Commision, 2000, July). Organizations spend billions of dollars of additional costs annually to improve e-procurement effectiveness. (Kalakota & Robinson, 2001) / (Ody, Supply Chain Collaboration, 2001a, December) (Ody, Winning Idea Masks Hidden Problems, 2001 b). Implementing process reengineering requires removing processes that contribute no added value. It is also important to choose software and hardware that would offer effective support to enhanced business processes." (Lesničar, 2002) (Sterle, 2001)

3- Readiness for e-procurement collaboration

Organizations want to have e-procurement, because they can improve process effectiveness by collaborating closely with all supply chain business partners. Collaboration is improved, especially by e-commerce and process reengineering, in addition to reviewing an organization's internal processes, including processes review of activities outside its borders. Implementing collaborative e-processes requires endeavors to increase inputs to improve organization and business development, and to perform e-procurement. (European Commision, 2000, July) Process reengineering is necessary for achieving process simplification. Following are some process simplifying factors." (FarajiJalal, 2007)
### Table 4: Business Preparation Simplifying Factors

<table>
<thead>
<tr>
<th>Business Process Preparation Simplifying Factors</th>
<th>Does not Significantly Simplify</th>
<th>No Impact</th>
<th>Significantly Simplifies</th>
<th>No Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 Possible Supplier's Requisition Request Simplifying</td>
<td>2.4</td>
<td>4.0</td>
<td>8.1</td>
<td>26.6</td>
</tr>
<tr>
<td>X2 Replacement of Supplier Simplifying</td>
<td>2.4</td>
<td>8.1</td>
<td>6.5</td>
<td>16.1</td>
</tr>
<tr>
<td>X3 Bidding Simplifying</td>
<td>0.0</td>
<td>2.4</td>
<td>5.6</td>
<td>20.2</td>
</tr>
<tr>
<td>X4 Access to Suppliers' Goods or Catalogues Simplifying</td>
<td>6.6</td>
<td>9.7</td>
<td>4.0</td>
<td>14.5</td>
</tr>
<tr>
<td>X5 Access to Suppliers' Inventory Data Simplifying</td>
<td>10.5</td>
<td>10.5</td>
<td>12.9</td>
<td>8.9</td>
</tr>
<tr>
<td>X9 Order Tracking Simplifying</td>
<td>0.0</td>
<td>3.2</td>
<td>16.1</td>
<td>24.2</td>
</tr>
<tr>
<td>X10 Search for Transporters Simplifying</td>
<td>3.2</td>
<td>0.0</td>
<td>15.3</td>
<td>10.9</td>
</tr>
<tr>
<td>X11 Transport Ordering Simplifying</td>
<td>0.0</td>
<td>0.0</td>
<td>7.3</td>
<td>33.9</td>
</tr>
<tr>
<td>X12 Receiving of Delivery Data Announcement Simplifying</td>
<td>0.0</td>
<td>3.2</td>
<td>6.5</td>
<td>17.7</td>
</tr>
</tbody>
</table>

Source: Sara Faraji Jalal, 2007

### 4- Satisfaction and positive e-procurement experiences sharing

If the e-procurement system provides a pleasant service, the buyer will take the view that the experience was positive and simple to use. Benefits and simple e-procurement contribute to a positive perception of e-procurement, which will gradually lead to actual use (Chen, 2000). Successful organizations in practice are the ones that succeed process simplification with the help of suppliers. It is also important to savings that are resulted from improvement, with suppliers (win-win situation). This kind of business leads to closer and longer connections with business partners. (Komp Leonard, 1999)

### 5- Environment changing response

Process simplification leads to a great deal of e-procurement opportunities especially because organizations have to react quickly to a changing environment (such as demand variability) and goods and process changes. (EuropeanCommision, 2000, July)
• E-procurement process type; for the buyer it is most important to simplify the following processes: goods availability (goods need to be at hand when a buyer needs them), order cycle, data retrieval, order adaptability, goods receiving, order mistakes dismissing, damaged goods returning, reserved parts availability and technical support. (Komp Leonard, 1999)

• E-procurement participants and its accessibility; e-procurement processes allow participants to easily change rules and eliminate some business partners through the whole supply chain, by for example undertaking direct e-procurement from supplier without other partners, thereby simplifying the whole e-procurement. Generally speaking, however, it is difficult to say if the total number of participants in the whole supply chain decreases. (Mesenbourg, 2002)

• In 2004 a case study concerning the analysis of the Greek governmental purchasing process carried out by (Panayiotou, Gayialis, & Tatsiopoulos, 2004) a set of performance indicators was defined including mean cycle times, transaction volumes (quantities, values, number of requests and tenders) and organizational units' capacities. The results of the analysis guided to the reengineering suggestions in three levels of changes and to the design of the new process with use of process charts. The functional specifications definitions were based on the new system design and the overall findings of the analysis. The methodology followed is presented in the figure below. Usually, public sector organizations are faced with challenges differing from challenges for private firms. They have to meet multiple, often conflicting goals, and they are subject to constraints of financial, legal, contractual, personnel and institutional nature. (Cilek, Wolfgang, Koch, Mild, & Taudes, 2001). Normally these constraints are much more binding than they are in private sector. For example, there might be no possibility to reduce the staff according to a new situation due to legislative constraints. (Kock Jr. & McQueen, 1996)/ (Luck & Peabody, 2000). The radical process-focused change in public sector organizations can only be achieved with deep changes in their bureaucratic practices. This, in turn, normally
cannot be achieved without either change in the law or privatization. (Jensen, 1991) (Mechling, 1994)

Figure 4: Methodology for the Assessment of Functional Specification
Source: Adapted from N.A. Panayiotou et al., 2004

2.5 BENEFITS AND BARRIERS OF E-PROCUREMENT

2.5.1 The Benefits / Drivers

An increasing number of companies are interested in using an online e-auction as one of their purchasing tools. Consequently, we sought to identify the major drivers that influence buyers and/or the sellers in their decision to implement e-procurement. These drivers include:

- E-procurement as a cost-cutting tool
- The opportunity for real-time bidding and response
- The auction process is transparent
- It reduces cycle time
- It increases geographical outreach

Cost-cutting tool

Since e-procurement can achieve gross savings of 5% to 40% (Tully, 2000) with a typical average of 15% to 20% gross savings (Cohn, The Hotest net bet yet, 2000), small firms gain a 15–25% reduction in prices in online
marketplaces compared with those negotiated by the business itself (Ash &Burn, 2006)/ (Lichtenthal & Eliaz, 2003). E-procurement systems are commonly used by senior managers to gauge the success of cost-cutting initiatives designed to maximize shareholder value (Child, 2002)/ (Goldsby &Eckert, 2003). Companies use e-procurement to reduce original procurement costs by approximately 5–10% through reverse auction and increased efficiency, which improves contract compliance, reduces cycle time, minimizes human errors, and results in better supply chain management. World Bank PREM notes state that e-procurement has generated numerous benefits, including enhanced transparency and public trust, and increased managerial efficiency (PremNotes, 2004). Some key factors for the successful adoption of e-procurement are clear commodity specifications, large purchase lots sufficient to justify the involvement of a number of suppliers, appropriate supply market conditions, and an existing organizational infrastructure (Smeltzer & Carr, 2002) (Subramaniam & Shaw, 2004). The e-procurement system opens doors to purchasing networks for suppliers and buyers, expands the selection of products, and makes information more easily obtainable. E Procurement also links a vast network of connections, and makes searching and contacting much more convenient.

**Real-time bidding and response**

To achieve a reduction in the cost of goods and services, e-procurement is seen as both a price-cutting tool for purchasing, and a system that allows repetitive and real-time bidding by multiple suppliers, which ultimately reduces purchasing cycle time. Carter et al. (Carter, Kaufmann, Beall, Carter, Hendrick, & Petersen, 2004) describe buyers who have used e-procurement, and most agree that it increases levels of trust, provides greater access to supplier data, and decreases cycle times for suppliers. It strengthens connections in supply chain management, as everything is sorted out by computer, price benefits are efficiently decreased, and companies avoid unnecessary inventory (Smeltzer & Carr, 2002) (Carter, Kaufmann, Beall, Carter, Hendrick, & Petersen, 2004) (Emiliani & Stec, 2002). It also helps negotiate better prices with suppliers, resulting in an average 5–12% price reduction and as much as a 20% reduction in costs (Smeltzer & Carr, 2002). Benefits are also realized by suppliers, including reductions in ordering and processing costs, reduced paperwork, improved cash flow, and reduced cost for credit control.
**Transparent auction process**

With dynamic pricing, sellers and buyers can immediately see competitors’ prices (Smeltzer & Carr, 2002)/(Emiliani & Stec, 2002) (Ginunipero & Sawchuk, 2000). A transparent transaction process is a key driver for e-procurement. For example, companies that have private B2B supplier software, integrated with a supplier’s order fulfillment system or linked to their product catalog on the website of the supplier’s platform, will be able to reduce administrative tasks, accelerate processes, provide more paperwork accuracy, and improve transparency in the collaboration with its suppliers. A fair and transparent auction process allows the buyer and seller to make their decisions effectively. The process and steps of every e-procurement action is observed and recorded in the system.

**Reduced cycle time**

Process efficiencies play a major role in simplifying and automating procurement. Our survey results found that e-procurement forces buyers to structure their bid before the bidding event, standardize the procurement process, and develop a strategy for purchasing, and those factors have the effect of shortening cycle times (Carter, Kaufmann, Beall, Carter, Hendrick, & Petersen, 2004). Companies also use electronic catalogs and search engines as part of their e-procurement process, and these are helpful for providing a quick overview of the purchasing process and identifying the correct product in a shorter period (Subramaniam & Shaw, 2004)/(Eakin, 2003). E-procurement automatically routes the product request and reduces cycle time to the responsible personnel faster and more effectively than traditional methods. E-procurement is not only a cost-cutting tool but it also eliminates paperwork, improves data accuracy, and Companies collaborate more effectively with suppliers and reduces the time between auction close and announcement of results. The results of decision making can be implemented in a timelier manner, which in turn lowers costs and reduces approval time if done through a carefully calculated assessment (Schwartz, 2004); (Sawhney, 2003); (Shaw M., 2004).
Geographical proximity

E-procurement easily increases the supply and spending bases with a supplier. This suggests that using e-procurement can exert complex relational effects on the supply base. In traditional markets, small manufacturers may be left out of channels that offer economies of scale advantages to larger manufacturers as well as exclusive distribution contracts (Rohm, Kashyap, Brashear, & Milne, 2004). We observed that companies in Taiwan need to become more visible in foreign markets, and e-procurement is one to accomplish this. We found that Taiwanese companies considerably increase their level of competition with foreign companies by using e-procurement systems. E-procurement should increase a company’s efficiency and establish Internet distribution channels that will enhance the competitiveness of Taiwan’s high-tech industry because of the existence of reduced barriers of entry.

2.5.2 The Barriers / drawbacks

It is important to understand the barriers to e-procurement that make it difficult for certain companies to adopt and use the process. Even though the use of e-procurement has grown rapidly in recent years, there are some challenges associated with it. Critics argue that the anticipated savings from e-procurement systems are hard to measure. Some suppliers refuse to participate in e-procurement bidding, believing it will result in less profit and more work. Since e-procurement reverses the traditional way of doing business, some suppliers believe it might jeopardize their profit-making abilities. Listed below are some of the possible drawbacks:

- Lack of system standards
- Negative impacts on trust, loyalty, and commitment
- Availability of resources
- Price pressures
- Ethical issues
- Unforeseen fees
- Barriers to implementation
Lack of system standards

Even though e-procurement offers a way to cut costs and improve efficiency when procuring products, the lack of standards may be a problem, especially when the ordering system is integrated with other corporate programs, or for the accessibility of the electronic catalog. When implementing an e-procurement system, most companies are concerned with having a standardized system, accuracy of data transfer, data consistency, cost, Internet security, and certification. For example, XML was used to obviate the need to reconfigure proprietary ordering systems when changing suppliers (Rohm, Kashyap, Brashear, & Milne, 2004). Product specification is another concern; when putting bids online, some suppliers complained about misleading product specifications and were concerned about their ability to realize a profit.

Negative impact on trust, loyalty, and commitment

In many instances, e-procurement alters the relationship between the buyer and seller. As the purchase decision is usually based on the lowest price, the buyer no longer feels loyal to the seller, and there may be a corresponding decrease in trust between the parties (Carter, Kaufmann, Beall, Carter, Hendrick, & Petersen, 2004)/ (Shawn & Nath, 2005). Indeed, it is possible that buyers may destroy their sellers’ trust (Jap, Going, going, gone., 2000)/ (Reed, 2005). Reverse e-auctions also have the potential to hurt a buyer’s long-term performance by sowing distrust among suppliers (Beldona & Raisinghani, 2004)/ (Gengatharen, Standing, & Burn, 2005)/ (Jap, An Exploratory Study of the Introduction of Online Reverse Auctions, 2003). Losing a buyer’s commitment may result in a supplier’s willingness to further invest on staff training and specialized tooling (Goldsby & Eckert, 2003)/ (Carter, Kaufmann, Beall, Carter, Hendrick, & Petersen, 2004). At the same time, employees using this system may fear being replaced if they are perceived as unqualified and/or unreceptive to the e-procurement tool. With the advent of e-procurement, long-time partnerships may be damaged or destroyed.
Availability of resources

The availability of resources cannot be guaranteed until contracts are finalized; making it difficult for firms to coordinate negotiations between their various input resources and their production outputs. This may lead to uncertainties about the value of the object being auctioned. (Laffont, 1997); (Nair, 2005)

Price pressures

Although pricing plays a major role in e-procurement, quality, payment terms, and on-time delivery are other important factors to consider when choosing suppliers. Unforeseen costs involved in switching to a new partner should be included, as the new supplier may not be able to deliver the product efficiently or meet specific requirements. This reinforces the importance of prior consensus by both parties. When buyers focus only on reducing costs, it is difficult for sellers to recognize the benefits of E-procurement. Even though price may be the primary concern for the buyer, quality delivery, technical capability, and other factors may influence the buyer’s willingness to use e-procurement (Shaw M. , 2004). Suppliers may also face difficulties when, in an attempt to gain business, they may bid emotionally, which could produce an under-cost bid (Smeltzer & Carr, 2002)/ (Tassabehji, Taylor, Beach, & Wood, 2006)/ (Van Tulder & Mol, 2002). When the purchase of goods is based on competitive prices, relationships with previous supplier may be destroyed.

Ethical issues

In a study by Carter et al., phantom bidding (buyers place fake bids trying to reduce the bid price, or they use unqualified suppliers to stimulate competition) is one unethical issue facing users of an e-procurement system. This not only damages the firm’s reputation but also lowers suppliers’ incentive to further participate in another auction. (Carter, Kaufmann, Beall, Carter, Hendrick, & Petersen, 2004)

Unforeseen fees

Putting the business online in order to participate in e-procurement is a high-tech innovation, but it often has negative results when price-only selection is
involved. According to Emiliani and Stec (Emiliani & Stec, 2002), administrative fees must be considered, because either the vendor or the winning bidder must pay an administrative fee or a percentage of the contract value, which will have an impact on the final cost. For example, in a GE case study (Emiliani M., 2000), the company’s cost-savings disappeared because of factors such as errors in supplier data, post-auction negotiations, and changes in specifications and quantities. These results highlight the need for higher levels of human intervention in the form of supplier identification, product selection, approvals, and order generation. Although the use of an e-procurement system may increase the number of suppliers, the switching costs involved in adding new suppliers can be unpredictable, including transportation, qualifications, tooling, training, first-article inspection, alignment of information systems, and so forth. While e-procurement may appear to be a high-tech innovation, it has the potential to propagate negative results with low-bid, price-only selections.

**Barriers to system implementation**

Some companies may not have sufficient facilities to embark on an e-procurement system or to use electronic tools. There may also be resistance from purchasing personnel and a lack of trained employees Commerce One. (Available at /http://www.commerceone.com / April 2010)In one of our interviews, a manager from the procurement department noted that since some of the participating companies lacked knowledge about the e-procurement and reverse auction system, training programs were formed prior to bidding so they could better understand the bidding system. (Yu, Yu, Itoga, & Lin, 2008)

**2.6 BENCHMARKING REQUIREMENTS FOR THE SUCCESS OF E-PROCUREMENT**

The difficulties faced by an enterprise’s procurement group are often eased by the utilization of an e-procurement application. However, technology is not a solution by itself; Best-in-Class performance is buoyed by combining
technology utilization with a strong emphasis on process control and standardization across the enterprise. (AberdeenGroup, 2007)

2.6.1 Competitive Assessment

Below paragraphs e-procurement users based on their processes, capabilities, technologies, and strategies in five major areas:

- **Process** – The level of standardization across the enterprise and the efficiency of current procurement processes.

- **Organization** – Organizational structure, skills, and decision-making alignment across the company – also a set of actively tracked performance metrics.

- **Knowledge** – Program visibility into KPIs – total spend, cycle times, user penetration, and compliance (price, process, governance); level of training and on-going support.

- **Technology** – Breadth of e-procurement technology footprint and how well it is integrated to support the broader source-to-settle framework and all supply management initiatives.

- **Performance** – The ability of an organization to measure the benefits of technology deployment, including an assessment of actual performance against key compliance metrics

These characteristics serve as a guideline for best practices, and correlate directly with Best-in-Class performance across the key metrics." (AberdeenGroup, 2007)
2.6.2 Capabilities and Enablers

Aberdeen’s global supply management research has shown time and again that the deployment of process automation tools enables procurement organizations to place more spend under management and improve procurement performance. Enterprises also typically experience a host of other advantages that relate to cost savings, process efficiencies, and the ability of procurement departments to deliver greater strategic value across the enterprise. (AberdeenGroup, 2007)

Process:

E-procurement touches every aspect of an enterprise including various business units, accounts payable department, budgets department, and finance department. Hence, deployment of an enterprise-wide solution requires a centralized department that is championed by executive management. Seventy-eight percent (78%) of Best-in-Class enterprises have a center-led procurement department, which is championed by a senior manager.

Supplier enablement and catalog management remains key challenges for all enterprises. Best-in-Class enterprises, on average, with 69% of their catalog maintenance done outside the enterprise, rely more heavily on external suppliers and solution providers to manage their existing catalogs and other supplier enablement activities than all other enterprises.

Additionally, 54% of Best-in-Class enterprises conduct periodic supplier rationalization to aggregate spends. Most importantly, the Best-in-Class realize that technology is a process-enabler and not a process by itself. Best-in-Class enterprises understand that rigorous processes to drive compliance and user adoption are required to be in place before introducing a new technology. (AberdeenGroup, 2007)
Organization, Performance, and Knowledge Management:

Seventy-eight percent (78%) of Best-in-Class enterprises have a center-led purchasing department, which is championed by a senior executive. This champion is directly linked to top procurement and financial executives and ensures information flow and coordination between finance, procurement, and accounts payable departments. Additionally the champion drives system adoption by promoting highly visible power users who are actively engaged with the user community. (Ibid)

Thirty-eight percent (38%) of Best-in-Class enterprises also reported the consistent use of an online dashboard to monitor key compliance performance metrics, including suppliers enabled, supplier performance, requisitions issued per month, off-catalog requisitions, and price variance and spend compliance. (Ibid)

Technology

The Best-in-Class enterprises have adopted the following procurement related technologies to improve performance:

- **Electronic purchase orders.** To eliminate the manual delivery of error-prone paper-based purchase orders, 84% of Best-in-Class enterprises use electronic purchase orders in EDI or XML format that are transmitted via the internet directly into suppliers Order Management System (OMS), with no human intervention. Direct integration of the purchase orders with supplier’s OMS leads to cost savings at the supplier end, part of which is returned to the buying organization in the form of additional discounts. In comparison to Industry Average firms, the Best-in-Class are 29% more likely to use electronic purchase orders and 65% more likely to do so than Laggard enterprises.

- **Supplier Networks.** 57% of Best-in-Class transfer the task of supplier enablement, catalog maintenance, and electronic purchase order integration to a third-party network provider by utilizing supplier networks or catalogs hubs. By providing one central outlet to handle PO’s, invoices, and catalog management, these networks improve
enablement rates without impacting internal resources or placing undo burdens on suppliers. Our survey revealed that Best-in-Class enterprises are 50% more likely to use supplier networks than Industry Average firms, and are more than 100% likely than Laggard enterprises.

- **On-demand procurement:** Best-in-Class, on average, displayed 56% more usage of on-demand e-procurement solution to manage spends that integrates with the ERP system than all other enterprises. These on-demand e-procurement solution were found particularly useful to capture services spend, which is not typically captured by a traditional e-procurement solution.

Best-in-Class performers employing above strategies have realized significantly greater efficiencies, cost reductions, and greater compliance with existing contracts. On average, Best-in-Class enterprises have 29% more on-contract spends, with their requisition-to-order cost being 32% lower than Industry Average firms. (AberdeenGroup, 2007)
<table>
<thead>
<tr>
<th>PROCESS</th>
<th>BEST-IN-CLASS</th>
<th>AVERAGE</th>
<th>LAGGARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement processes standardized across the enterprise</td>
<td>68%</td>
<td>56%</td>
<td>48%</td>
</tr>
<tr>
<td>Utilize catalog management services or tools</td>
<td>68%</td>
<td>60%</td>
<td>53%</td>
</tr>
<tr>
<td>Periodic supplier rationalizing</td>
<td>54%</td>
<td>39%</td>
<td>37%</td>
</tr>
<tr>
<td>ORGANIZATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearly defined executive sponsor or champion</td>
<td>79%</td>
<td>72%</td>
<td>62%</td>
</tr>
<tr>
<td>Center-led procurement organization</td>
<td>78%</td>
<td>67%</td>
<td>61%</td>
</tr>
<tr>
<td>Highly visible power users that are actively engaged</td>
<td>56%</td>
<td>45%</td>
<td>38%</td>
</tr>
<tr>
<td>Cross-functional coordination amongst procurement, finance, A/P</td>
<td>79%</td>
<td>65%</td>
<td>59%</td>
</tr>
<tr>
<td>KNOWLEDGE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metrics in place to evaluate performance</td>
<td>53%</td>
<td>43%</td>
<td>36%</td>
</tr>
<tr>
<td>Implement reporting capabilities</td>
<td>56%</td>
<td>48%</td>
<td>39%</td>
</tr>
<tr>
<td>TECHNOLOGY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrate e-procurement system with e-payables</td>
<td>75%</td>
<td>59%</td>
<td>41%</td>
</tr>
<tr>
<td>Utilize electronic purchase orders</td>
<td>84%</td>
<td>65%</td>
<td>51%</td>
</tr>
<tr>
<td>Utilize supplier network</td>
<td>57%</td>
<td>38%</td>
<td>25%</td>
</tr>
<tr>
<td>On-demand services procurement solution that integrates with ERP</td>
<td>42%</td>
<td>28%</td>
<td>20%</td>
</tr>
<tr>
<td>Conduct spend analysis (data cleansing and classification) software</td>
<td>56%</td>
<td>45%</td>
<td>41%</td>
</tr>
<tr>
<td>Deploy category-specific procurement solution (e.g. T&amp;E, contract labor, MRO etc.)</td>
<td>54%</td>
<td>48%</td>
<td>36%</td>
</tr>
<tr>
<td>PERFORMANCE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well-defined metrics, incentives, and penalties to drive compliance</td>
<td>33%</td>
<td>22%</td>
<td>17%</td>
</tr>
<tr>
<td>Online dashboard to monitor spend performance metrics</td>
<td>38%</td>
<td>24%</td>
<td>21%</td>
</tr>
<tr>
<td>Supplier performance management</td>
<td>46%</td>
<td>34%</td>
<td>28%</td>
</tr>
</tbody>
</table>

Table 5: The Competitive Framework
Source: Aberdeen Group, October 2007
2.7. Conceptualization and frame of reference

The aim of conceptualization is explaining the most important of the study both graphically and also in narrative form. Also shows the important points which are studying. (Miles & Huberman, 1994). In the first chapter the introduction of the topic was mentioned. Then it went with describing the problem area and according to that formed the thesis' research questions. In the second chapter, the literature related to the topic was given in order to develop the frame of reference. In this chapter the research questions will briefly introduced and then conceptualization will be follow that which will guide us to the research questions.

2.7.1 Conceptualization

This study concerns the identification of advantages and backwards of applying e-procurement in B2B market of Iran with car manufacturing attitude. In order to select which reference to choose for identifying success factors of e-procurement, different models of these factors from relevant published work and from experimental iterations of running the research model were studied.

The criteria for selecting the theories which were proposed are the research questions which defined in chapter one and now it is presented:

1- To what degree automakers are using e-procurement for obtaining parts or components in Iran?

To answer my research question, I need to investigate about systems, process and e-procurement benefits, suggested in literature review and which we used them for basement of my study.

E-Procurement system: According to Croom (2001), "the system of e-procurement illustrates the process of procurement via providing two connected but of course distinct infrastructures, external communication with the supply base (through e.g. internet-based platforms) and internal processing (through e.g. corporate intranet)." (Croom S. R., Supply Chain Management in the E-Business Era, An Investigation into supply Chain Strategies, Practices and Progress in E-Business Adoption, 2001)
2. What are the benefits of applying e-procurement for Iranian automakers companies?

For answering the second question we can mention the benefits from (Wyld, 2002, November):

**Price advantages**

The benefits related to price are emerged as the result of the better demand of management abilities and potentials in the process of e-procurement. The costs related to procurement are decreased via supplier search economies and so increasing the competition of prices among sellers. (Croom & Johnston, 2003)/ (Shaw & Subramaniam, 2002). The price benefits are from reducing the potential prices off the average of the market price, and the benefits related to the costs of transaction are coming from the savings in search, negotiating, contracting and the costs of the coordinating. The lock-in costs which are related to technology are those which are involved in selecting and using one specific procurement system which requires costs of switching and the contracted sellers' opportunistic behavior. These costs are set according to the extent from uncertainty protection. (Shaw & Subramaniam, 2002)

**Decreased procurement cycle times**

Based on NECCC (2002), e-procurement has a kind of ability to decrease current resources included paper and manually according procurement processes via payment processes improvement and reduce cycle times. "Workflow — from producing a purchase request through to payment — can be managed electronically by e-procurement processes, reducing errors and processing time. These efficiencies enable a reduced cycle time from requisition to payment. The Aberdeen Group estimates the time saved at 70 per cent. These timesaving allow reduced inventory levels, resulting in additional cost savings through better cash flow and lessened inventory carrying costs. (Ernst & Young, 2001)

**Decreased transaction and administration expenditure**

One of the most important benefits from e-procurement adoption is reducing in transaction cost. This target could accessed by prohibiting entry of the data and errors correction in paper working and moreover, search saving, negotiation and
contracting and coordination costs. (Nam, 1998) (Shaw & Subramaniam, 2002)

Based on Shaw and Subramaniam (2002), search saving, negotiation, contracting and coordination cost conclude the transaction cost benefits. Decreasing in procurement administration costs begin with reducing the time and/or the quantity of people with reduced for process of purchase order requisition. (AberdeenGroup, E-Sourcing: Negotiating Value in a Volatile Economy- an Executive White Paper, 2001)

**Improving the visibility of customer needs**

Determining tomorrow's winners in all activities can be done by using the tools of e-commerce for collaborating with suppliers, distributors and customers. (Andrew, 2001). E-procurement gives the ability to companies in order to deconcentrate the processes of procurement which are operational and also concentrating the processes of procurement which are strategic and so these are the result for the more clear supply chain that is provided by the system of e-procurement. (Puschmann & Alt, 2005)

**Decreasing the costs of operating and stock**

The buyer will gain functional efficiency via utilizing e-procurement system in the form of decreasing the inventory cost and also ordering cost, and obtaining this efficiency can raise the amount of suppliers who has joined the network. (Dai & Kauffman, 2001)

Based on Puschmann and Alt (2005), e-procurement efficiency advantages are included of process, goods and services and stock savings. Using e-business, the decrease in the supply-chain costs is from the decrease in inventory levels, raising the competitions of sellers and shortening the cycle time of ordering." (Chaffey, 2004)

**Intensify decision making**

Based on NECCC(2002), e-procurement can give this opportunity for raising more the auditions and automated accountability and also tracking it from the first point of start to the last one. And so the more raised and complex operational reporting can guide us to improved decision making. The e-procurement efficiency advantages present the proactive management of the
most important data and purchasing decision with higher-quality in the companies and firms. (Puschmann & Alt, 2005)

3. **What are the limitations of applying e-procurement for Iranian automakers companies?**

For the third question we can again refer to Wyld (2002: p 22-53), as he explains more about the limits of applying e-procurement: (Wyld, 2002, November)

**Insufficient foundation of technology**

According to Payne, in developing countries, SME's are confronting more contests when they are seeking to obtain electronic commerce than businesses which are involved in developed countries. This context is consists of barriers of technical infrastructure (access and pricing), laws and regulations, limited logistics systems (roads, rail and air) and more." (Afsharipour, Afshari, & Sahaf, 2006)

**Insufficient partners' foundation of technology**

According to Stein and Hawking (2002), "one of the most important barriers of e-procurement is the insufficient partners' technological infrastructure." (Stein & Hawking, 2002)

**Deficiency of expert human resources**

Deficiency of expert personnel is also one of the main barriers of e-procurement. (Stein & Hawking, 2002)

**Deficiency in merging system with partners and their co-operation**

According to Shaw and Subramaniam (2002), the ranges of B2B operations are more than purchasing initiatives, and enlarge to the "extended enterprise" to contain other business partners and all suppliers. However, all business partners do not have the same characteristics for e-procurement adopting. If both user and supplier participate in the system, then the potential values of the system realize. (Shaw & Subramaniam, 2002)
The cost of implementing

Croom, 2001 and 2005, identified the level of consent and disparity with five important found out obstacles. Only regarding development cost some shortage of disparity was available with the criteria found out as an obstacle. (Croom S. R., Supply Chain Management in the E-Business Era, An Investigation into supply Chain Strategies, Practices and Progress in E-Business Adoption, 2001) (Croom S. R., The Impact of e-business on supply chain management: An Empirical Study of key developments, 2005)

Company Culture

Based on PricewaterhouseCoopers, the enterprise should be counted into a change-embracing thing, one with a culture that agreed which is differing every tomorrow and whole evolution are eligible investigating for the benefits which are brought by them. (PriceWaterHouseCoopers(PWC), 2002)

Lack of business processes for e-procurement support

Ernst & Young (2001) has an idea: Requirement to the re-engineer business process as the most important drawback in a study of the main impediments to e-business success. (Ernst & Young, 2001)

Legal and Controlling

According to PricewaterhouseCoopers (2002): Maybe the greatest challenges which companies turn toward is considering E-business are legal and controlling subject such as mental property rights and taxes and territory challenges, moreover security subject like data secrecy deceit, privacy and industrial intelligence. (PriceWaterHouseCoopers(PWC), 2002)

Security

Based on Min & Galle idea, when asked to appraise the seriousness of impediments which may disturb effective Internet-based, Cyber-purchasing, the greatest important impediment is shortage of security of Internet transaction. (Min & Galle, 1999)
Insufficient e-procurement solutions

Tranmit (2002) has stated, shortage of appropriate offerings is one of the e-procurement limitations. Moreover Aberdeen (2002), have mentioned most of e-procurement solutions have centered on automating the front-end, procure-to-order cycles, providing little, if any support for crucial back-end process for instance manager supply, sourcing order fulfillment and financial settlement. (AberdeenGroup, e-procurement: Finally Ready for Prime Time', 2002)

Senior management commitment

According to pricewaterhouseCoopers (2002), E-business innovation success is supported by strategic decisions that ensure positioning with the goals and vision of company in long term, which needs senior management support. (PriceWaterHouseCoopers(PWC), 2002)
3. Methodology

This chapter will present the procedure of research. According to (Marshall & Rossman, 1999), a methodology chapter tends to depict design and method of research. Although there is some dependency between research Method, practices and research problem, research question that are asked. Besides it must show scientific positioning of researcher. (Marshall & Rossman, 1999) "Thus in methodology the steps are described one by one to show an overview of the way of occurring and calculating data according to using validity and reliability criteria to promise that this research cover certain standard when presenting the procedure. (Foster, 1998)

3.1 Research Purpose

The purpose with research is to express by conducting research what is to be completed and how the research result can be used. (Yin, Case Study Research: Design and Methods, 2003). The scientific research has three purposes: exploratory, descriptive or explanatory. (Reynolds, 1971); (Yin, Case Study Research: Design and Methods, 2003)

"Exploratory studies are valuable means of finding out what is happening; to seek new insights; to ask questions and to assess phenomena in a new light." It is particularly useful if you wish to clarify your understanding of a problem, such as if you are unsure of the precise nature of the problem (Figure 5). It may well be that time is well spent on exploratory research, as it may be show that the research is not worth pursuing further." (Saunders, Lewis, & Thornhill, 2007)
Based on Saunders et al., 2007 idea there are three principal ways of conducting exploratory research:

- A search of the literature
- Interviewing 'Experts' in the subject
- Conducting focus group interview

**Exploratory studies**

Exploratory research can be likened to the activities of the traveler or explorer. Its great advantage is that it is flexible and adaptable to change. If you are conducting exploratory research you must be willing to change your direction as a result of new data that appear and new insights that can occur to you. (Saunders, Lewis, & Thornhill, 2007)

Adams and Schvaneveldt (1991), reinforce this point by arguing that the flexibility inherent in exploratory research does not mean absence of direction to the enquiry. What it does mean is that the focus is initially broad and becomes progressively narrower as the research progresses. (Saunders, Lewis, & Thornhill, 2007)

As the research developing the focus is primary broad and become gradually deeper. The aim of exploratory research is to collect a specific subject as much information as possible. For gathering this information as a further common to
use many different sources, interview when purchasing an exploratory research, is the best suited technique for information collecting. (Yin, Case Study Research: Design and Methods, 2003)

According to Yin (2003), exploratory research when the problem is difficult to limit also when the intuition of which model to use is scattered, moreover when it is unclear what characteristics and relations are important is useful. An exploratory study by expressing a purpose and criteria to judge the exploration successful should be designed. (Yin, Case Study Research: Design and Methods, 2003)

**Descriptive studies**

According to Reynolds, (1971), descriptive research apart from exploratory researchers is based on some last understanding of the nature of research problem, providing a description of different phenomena which is connected to individuals, moreover situations or events that occur. The aim might be to develop empirical generalization. They are worth explaining which conduct to theory development once such generalizations start to appear. (Reynolds, 1971)

Besides descriptive research is usually use when there is no intention to investigate cause/effect relationship and a problem is well illustrated. (Reynolds, 1971)

The object of descriptive research is "to portray as accurate profile of person, events or situations" (Robson, 2002). This may be an extension of, or a forerunner to, a piece of exploratory research or a piece of explanatory research. It is necessary to have a clear picture of the phenomenon on which you wish to collect data prior to the collection of the data. (Saunders, Lewis, & Thornhill, 2007)

Description in management and business research has a very clear place. However, it should be thought of as a means to an end rather than an end in itself. (Saunders, Lewis, & Thornhill, 2007)

**Explanatory studies**

This kind of study provides casual relationships among variables. The most important thing in these studies is studying a situation or problem to illustrate the relationship of variables. (Saunders, Lewis, & Thornhill, 2007). The aim of this research is to examine the cause/effect relationships, to illustrate which
effects are caused by which causes. (Yin, Case Study Research: Design and Methods, 2003). Based on Reynolds (1971), the aim of explanatory study is to improve a theory which is used to express the generalization which is done empirically and was improve in descriptive step, which in that the cycle of theory construction, theory testing and theory reformulation is prepared. (Saunders, Lewis, & Thornhill, 2007)

According to my research question because of my intention to describe causal effect on relationship by assess answers to the research questions therefore my study will be somehow explanatory. Also due to my research questions which are intended to explain the research area and also to express the data collected for analyzing the benefits and limitations of use of e-procurement my study will be descriptive.

3.2 Research Approach

The best approach for one study is defined by the purpose of the study and the research questions which accompany them. (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994). Research approaches can be divided in two categories, first deductive versus inductive research and secondly qualitative versus quantitative. (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994) The research approach is deductive where a theory and hypothesis (or hypotheses) are developed and a research strategy is designed to test the hypothesis, or it is inductive where data is collected and theory is developed as a result of data analysis. (Saunders, Lewis, & Thornhill, 2007)

In this study, at first the research question is developed. Research strategies are designed and research questions are answered accordingly. Therefore, the research approach is deductive.

Research purpose and its accompanying research questions are the most important factors which determine the best research method to use for the study. (Yin, Case Study Research: Design and Methods, 2003). According to Holme and Solvang (1997), there are two kinds of approaches: quantitative and qualitative and the most important difference of these two is that in quantitative
it is mostly according to numbers and statistics which are shown in figures. But in qualitative approach it is mostly according to the events described by words. The problem definition and the information which are needed are the key factors of selecting between these two approaches. (Holme & Solvang, 1997)

The purpose for both qualitative and quantitative approach is to create a better understanding of the society and to comprehend how individuals, groups and institutions act and have an influence on each other. (Holme & Solvang, 1997)

To reach each purpose different paths are however taken. The quantitative approach uses generalizations, based on the processes results of the investigation. For the qualitative approach the research problem is described out of the situation as a whole, without basing it on generalization. According to Yin (2003), both methods have strengths and weaknesses. The approach best suited depends therefore on the specific study's research problem and accompanying research question. Quantitative approach is also characterized by being study few variables and a large number of entities. To find answers to its research problem this is normally done in board sense by using surveys with already set answering alternatives. (Yin, Case Study Research: Design and Methods, 2003)

Furthermore, this approach is considered especially useful when conducting a wide investigation that contains many units. (Holme & Solvang, 1997)

Qualitative research approach aims at reaching a better understanding of the phenomenon being studied, they also tend to be relative flexible. According to Yin (2003), qualitative research approach aims at reaching a better understanding of the phenomenon being studied, they also tend to be relative flexible. The qualitative studies are greatly based on researcher's description, emotions and reactions. (Yin, Case Study Research: Design and Methods, 2003)

Holme and Slovang (1997) has stated that: it also has a large closeness to the respondents and where the data and information has been collected from. (Holme & Solvang, 1997)

The qualitative approach is known as it is collecting a huge amount of information and then analyzes the variables that are collected from several sources. The most common way to gather high quality data is by using interviews and case studies in that there are no set answers are available. (Holme & Solvang, 1997)
According to mentioned discussion and my research question I have chosen qualitative approach as I had to investigate and analyze research area deeply and go narrower down in e-procurement subject. On the other hand, I have not had any intention for generalizing the data.

3.3 Research strategy

Strategy is like a map, a plan which is doing the organized search of the interested phenomenon. (Marshall & Rossman, 1999)

For a researcher there are some many strategies. According to Yin (1994), there are five strategies: survey, experiment, experiment, case study, history and analysis of archival information. Each of these strategies has their own way of gathering and investigate and analyzing the evidences. For exploratory studies, often case study best suits, for descriptive, survey and history, and for explanatory or casual inquiry the only way is experiment. Also he has mentioned that this view maybe to some extent wrong and that these five strategies can be used for all three aims. Based on Yin (1994), there are three conditions that he recognizes these strategies in (Table 6): (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994)
1. Research questions that is presented
2. How much control the researcher has on the existent behavioral events
3. How much is the focus on contemporary as opposed to historical events

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Form of Research Questions</th>
<th>Required Control over Behavioral Events</th>
<th>Focuses on Contemporarily Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiments</td>
<td>How, Why</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Survey</td>
<td>Who, What, Where, How many, How much</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Archival Analysis</td>
<td>Who, What, Where, How many, How much</td>
<td>No</td>
<td>Yes / No</td>
</tr>
<tr>
<td>History</td>
<td>How, Why</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Case Study</td>
<td>How, Why</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 6: Relevant Situations for Different Research Strategies
Source: Yin, 1994: p.6
The most important thing which distinguishes about which strategy we have to use is the research question/s. For survey and archival records, we usually use "What", "who", and "Where" questions, also "How many" and "How much" which are their derivations. In case study, history and experiment we use "How" and "why". Besides there are two other items which we use for distinguishing the strategy we use which are "degree of focus on contemporary as opposed to historical events" and "extent of control over behavioral events". The strategy which needs "control over events" is experiment, while history does not have anything with contemporary events as for examining contemporary events we use case study while the applicable behaviors are not influenced. (Saunders, Lewis, & Thornhill, 2007)

According to my research questions that are mostly based on questions with what and how, and as my focus is on contemporarily events, moreover over behavioral events there is not any control, so it is concluded that I am working on something between case study and survey. I am more near to case study as I have chosen qualitative approach for my research.

As Yin (1994) has stated: a case study is an investigation which analyzes the contemporary events in its actual environment, especially when there is not any specific borders between that event and that environment. Besides, Yin(1994) describe that for "Case" there are two states; first individual state and the other one something which is less well defined than a single individual such as process or an organization. Yin (1994) also emphasizes on the unit for investigating which is the case and which is relating the unit to that and so to the direction that the research questions had explained. (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994)

Also based on Miles and Huberman (1994), the unit of investigating is case which is also mentioned as the "heart" of the study. So, based on Yin (1994), case study can have both single- case or multiple- case design and those two designs also include both single or embedded multiple units of analysis. Miles & Huberman (Miles & Huberman, 1994), has stated that in multiple-case studies if we take a look at some similar and some different cases, we can add more authenticity to our findings and conclusions. And by analyzing those similar and different cases we can realize much more than the findings gain through single case study. To follow that logic of repeating, the dominant insight is considering
multiple- cases as that one can realize it multiple experiment. (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994)

<table>
<thead>
<tr>
<th>Exploratory research</th>
<th>Survey research</th>
</tr>
</thead>
<tbody>
<tr>
<td>unstructured</td>
<td>structured</td>
</tr>
<tr>
<td>Interviews</td>
<td>Critical incidents</td>
</tr>
<tr>
<td>Panels</td>
<td>Focus groups</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Lots of white space on the page</td>
</tr>
<tr>
<td>Observation documentary</td>
<td>Keeping a research diary</td>
</tr>
<tr>
<td></td>
<td>Rhetorical analysis</td>
</tr>
</tbody>
</table>

Table 7: Unstructured and Structured approaches to the main research methods
Source: Colin Fisher, 2007: p 159

According to my research discussion, for providing a compare among the cases in relation of my research area, I had to choose multiple-case study for the strategy of my research, which helps me to examine the sameness and differences among the cases.

3-4. Selection of sample:

Already I have mentioned, the approach that I have chosen in my study is multiple-case study. Based on Miles and Huberman (1994), maybe the "multiple-case sampling" has some repeated points but we have to think about cautiously and which requires a frame of explicit sampling and then research questions and conceptual framework will follow that. It is useful to mention that in multiple-case study random sampling has no effect. In this study, a theoretic framework and concepts guide sampling were needed and so I used purposive
and theoretical sampling. (Marshall & Rossman, 1999). According to Yin (1994), there are three main criteria for cases selecting: Convenience, Access and Geographic proximity. This research started with accessed sites and makes insights and relation from sooner data collection. Based on research problem and problem area this research investigated only buyer side of e-procurement system. (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994)

Croom (2005), mentioned price pressure and reducing the cost after supply chain management and integration was the most important supply chain issue facing organization that they hope by implementation of e-business get removed off. (Croom S. R., The Impact of e-business on supply chain management: An Empirical Study of key developments, 2005)

*The empirical investigating of this study is limited to Iranian B2B car manufacturing companies, because of geographical location and resources limitations.*

### 3-5. The methodology of data collection:


Based on Yin (1994), interview is one of the most important methods of data collection for case studies. (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994). That is why I have chosen interview for data collection. Interview according to Emory & Cooper (1991) could be divided into two kinds: focused interviews and structured. (Emroy & Cooper, 1991). In focused interview since it pursues a guideline for interview instead and advanced discussion by the respondent, it is better for adopting complex subjects. The structured interview pursue a structured questionnaire, thus it has
better adopted for surveys." (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994)

Patton (1990), "classified interviews into three types:
1. Informal conversational interview
2. General interview guide approach
3. Standardized open-ended interview"
(Patton, 1990)

According to Emroy & Cooper (1991), regarding focused interview there are two different ways for conducting personal face-to-face interviewing and telephone interviewing. (Emroy & Cooper, 1991)

*Due to some limitations for access to responsible man/woman related to the research, I found out the telephone interview is more convenience for accessing to the information but before that I had provided a questionnaire and sent it to them, then did telephone interviewing finally.*

**3-6. Data analysis**

According to Yin (1994), data analysis involves examining, categorizing, tabulating or otherwise recombining the collected data. Every investigation should have a general analytical strategy in order to determine what to analyze and why. Two general strategies are proposed: either researcher relying on the theoretical propositions and following the selected frame of reference, or developing a case description, that is, use a descriptive way to present data. (Yin, Case Study Research: Design and Methods, (Second Edition Ed.), 1994)

There are four analyzing techniques within these strategies:
- Pattern matching: comparing empirically based pattern with a predicted one
- Explanation building: A type of pattern matching where the goal is to analyze the case study data by stipulating a set of casual links about it
- Times-series analysis: multiple measures of the dependent variable in order to look at changes over time
- Program logic models: combination of pattern-matching and time-series analysis, where the complex chain of patterns over time is being stipulated.
In this study we used a selected frame of reference for the case study research. We also used pattern matching strategy as by comparing the case study with previous theories presented in the literature review.

According to Miles and Huberman, (1994), analysis consists of three flows of activity: data reduction, data display, and conclusion drawing and verification.

- The data reduction stage of the analysis helps the researcher to make the data sharp, sorted, focused, discarded, and organized in order to be able to draw and verify conclusions.

- The data display is a way to organize and compress the reduced data so that it will make it easier to draw conclusions. This phase is useful when the researcher studies more than one case, a so-called multiple case.

- Conclusion drawing and verification involve noting regularities, patterns, explanations, possible configurations, casual flows and propositions.

*In this study, these three steps are followed in order to analyze the empirical data. I used the within-case analysis. The data was reduced through a within-case analysis where the cases will be compared against the frame of reference. A cross case analysis was also performed with the intention to compare the two cases with each other, in order to find similarities and differences. Conclusions from these analyses will be drawn based on the patterns of similarities and differences, which are discovered in the data reduction and data display.*

3.7. Reliability:

Reliability means accurate and stable results which are given by measuring instrument e.g. questionnaire. According to Louise Jung and Widmark (2004),"a good reliable research is if any other person uses the same methods at another time and sample for investigating the same subject would get the same results." (Louise Jung & Widmark, 2004)
In my study for increasing the reliability, first I sent every chapter for final check with Iranian supervisor (Dr. Monavarian), moreover, I tried not to ask any subjective questions. Besides, I kept all questionnaire replies for progressing the data base of case study.
4. Data Analysis

In this chapter I will compare empirical data with theories that I had chosen in my conceptualization. Interviews data will be analyzed together and in this section it will be according to my research questions.

1- To what degree automakers are using e-procurement for obtaining parts or components in Iran?

For replying our first research question based on our conceptualization, I assessed the dealing of e-procurement in five B2B Companies with car manufacturing attitudes in Iran in two aspects: model, system.

E-procurement Model:
**E-Procurement system:** e-procurement systems is spirit reflect of the process of the procurement via supply of two infrastructural connected separated things, first internal processing for instance cooperate intranet and external communication with the supply base for instance internet-based platforms.

<table>
<thead>
<tr>
<th>Question</th>
<th>Zamiyad</th>
<th>Topco</th>
<th>Saze Gostar Saipa</th>
<th>Sanaye Khodrosazi Kerman</th>
<th>SAPCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigating supplier website for selecting the goods</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>sending request for information</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>request quotation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>receiving proposal</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>receiving supplier data regarding quality certification, financial status or unique capabilities</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>tender</td>
<td>×</td>
<td>×</td>
<td>✓</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
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<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>sending the orders</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>e-payment</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>delivering the goods and services</td>
<td>×</td>
<td>×</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
</tr>
</tbody>
</table>

2. What are the benefits of applying e-procurement for Iranian automakers companies?

**Price advantages**

The benefits related to price are emerged as the result of the better demand of management abilities and potentials in the process of e-procurement. The costs related to procurement are decreased via supplier search economies and so
increasing the competition of prices among sellers. (Croom & Johnston, 2003)/ (Shaw & Subramaniam, 2002). The price benefits are from reducing the potential prices off the average of the market price, and the benefits related to the costs of transaction are coming from the savings in search, negotiating, contracting and the costs of the coordinating. The lock-in costs which are related to technology are those which are involved in selecting and using one specific procurement system which requires costs of switching and the contracted sellers' opportunistic behavior. These costs are set according to the extent from uncertainty protection. (Shaw & Subramaniam, 2002)

**Decreased procurement cycle times**

Based on NECCC (2002), e-procurement has a kind of ability to decrease current resources included paper and manually according procurement processes via payment processes improvement and reduce cycle times."Workflow — from producing a purchase request through to payment — can be managed electronically by e-procurement processes, reducing errors and processing time. These efficiencies enable a reduced cycle time from requisition to payment. The Aberdeen Group estimates the time saved at 70 per cent. These timesaving allow reduced inventory levels, resulting in additional cost savings through better cash flow and lessened inventory carrying costs. (Ernst & Young, 2001)

**Decreased transaction and administration expenditure**

One of the most important benefits from e-procurement adoption is reducing in transaction cost. This target could accessed by prohibiting entry of the data and errors correction in paper working and moreover, search saving, negotiation and contracting and coordination costs. (Nam, 1998)/ (Shaw & Subramaniam, 2002). Based on Shaw and Subramaniam (2002), search saving, negotiation, contracting and coordination cost conclude the transaction cost benefits. Decreasing in procurement administration costs begin with reducing the time and/or the quantity of people with reduced for process of purchase order requisition. (Aberdeen Group, E-Sourcing: Negotiating Value in a Volatile Economy- an Executive White Paper, 2001)
Improving the visibiliness of customer needs

Determining tomorrow's winners in all activities can be done by using the tools of e-commerce for collaborating with suppliers, distributors and customers. (Andrew, 2001). E-procurement gives the ability to companies in order to deconcentrate the processes of procurement which are operational and also concentrating the processes of procurement which are strategic and so these are the result for the more clear supply chain that is provided by the system of e-procurement. (Puschmann & Alt, 2005)

Decreasing the costs of operating and stock

The buyer will gain functional efficiency via utilizing e-procurement system in the form of decreasing the inventory cost and also ordering cost, and obtaining this efficiency can raise the amount of suppliers who has joined the network. (Dai & Kauffman, 2001)

Based on Puschmann and Alt (Puschmann & Alt, 2005), e-procurement efficiency advantages are included of process, goods and services and stock savings. Using e-business, the decrease in the supply-chain costs is from the decrease in inventory levels, raising the competitions of sellers and shortening the cycle time of ordering. (Chaffey, 2004)

Intensify decision making

Based on NECCC (NECCC, 2002), e-procurement can give this opportunity for raising more the auditions and automated accountability and also tracking it from the first point of start to the last one. And so the more raised and complex operational reporting can guide us to improved decision making. The e-procurement efficiency advantages present the proactive management of the most important data and purchasing decision with higher-quality in the companies and firms. (Puschmann & Alt, 2005)
3. What are the limitations of applying e-procurement for Iranian automakers companies?

For the third question we can again refer to Wyld (2004), as he explains more about the limits of applying e-procurement: (Wyld, 2002, November)

**Insufficient foundation of technology**

According to Payne, in developing countries, SME's are confronting more contests when they are seeking to obtain electronic commerce than businesses which are involved in developed countries. This context is consists of barriers of technical infrastructure (access and pricing), laws and regulations, limited logistics systems (roads, rail and air) and more. (Afsharipour, Afshari, & Sahaf, 2006)
Insufficient partners' foundation of technology

According to Stein and Hawking (2002), one of the most important barriers of e-procurement is the insufficient partners' technological infrastructure. (Stein & Hawking, 2002)

Deficiency of expert human resources

Deficiency of expert personnel is also one of the main barriers of e-procurement. (Stein & Hawking, 2002)

Deficiency in merging system with partners and their co-operation

According to Shaw and Subramaniam (2002), the ranges of B2B operations are more than purchasing initiatives, and enlarge to the "extended enterprise" to contain other business partners and all suppliers. However, all business partners do not have the same characteristics for e-procurement adopting. If both user and supplier participate in the system, then the potential values of the system realize. (Shaw & Subramaniam, 2002)

The cost of implementing

Croom, 2001 and 2005, identified the level of consent and disparity with five important found out obstacles. Only regarding development cost some shortage of disparity was available with the criteria found out as an obstacle. (Croom S. R., Supply Chain Management in the E-Business Era, An Investigation into supply Chain Strategies, Practices and Progress in E-Business Adoption, 2001); (Croom S. R., The Impact of e-business on supply chain management: An Empirical Study of key developments, 2005)

Company Culture

Based on PricewaterhouseCoopers, the enterprise should be counted into a change-embracing thing, one with a culture that agreed which is differing every tomorrow and whole evolution are eligible investigating for the benefits which are brought by them. (PriceWaterHouseCoopers(PWC), 2002)
Lack of business processes for e-procurement support

Ernst & Young (2001) has an idea: Requirement to the re-engineer business process as the most important drawback in a study of the main impediments to e-business success. (Ernst & Young, 2001)

Legal and Controlling

According to PricewaterhouseCoopers (2002), Maybe the greatest challenges which companies turn toward is considering E-business are legal and controlling subject such as mental property rights and taxes and territory challenges, moreover security subject like data secrecy deceit, privacy and industrial intelligence. (PriceWaterHouseCoopers(PWC), 2002)

Security

Based on Min & Galle idea, when asked to appraise the seriousness of impediments which may disturb effective Internet-based, Cyber-purchasing, the greatest important impediment is shortage of security of Internet transaction. (Min & Galle, 1999)

Insufficient e-procurement solutions

Tranmit (2002), has stated: shortage of appropriate offerings is one of the e-procurement limitations. (Tranmit, 2002) Moreover Aberdeen (2002), have mentioned most of e-procurement solutions have centered on automating the front-end, procure-to-order cycles, providing little, if any support for crucial back-end process for instance manager supply, sourcing order fulfillment and financial settlement. (AberdeenGroup, e-procurement: Finally Ready for Prime Time', 2002)

Senior management commitment

According to pricewaterhouseCoopers (2002), E-business innovation success is supported by strategic decisions that ensure positioning with the goals and vision of company in long term, which needs senior management support. (PriceWaterHouseCoopers(PWC), 2002)
<table>
<thead>
<tr>
<th>Question</th>
<th>Zamiyad</th>
<th>Topco</th>
<th>Saze Gostar Saipa</th>
<th>Sanaye Khodrosazi Kerman</th>
<th>SAPCO</th>
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<tr>
<td>Insufficient foundation of technology</td>
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<tr>
<td>Deficiency in merging system with partners and their co-operation</td>
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<tr>
<td>Insufficient e-procurement solutions</td>
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5. Finding, Conclusion and Implications:

In this chapter, I will present findings and conclusions discussed in this section is drawn from the outcome of the analysis of the research and data gathering from the 5 biggest B2B car manufacturing companies in Iran. Consequently, I will bring my research questions based on my finding, will try to answer them.

1. To what degree automakers are using e-procurement for obtaining parts or components in Iran?
   The conclusion of this research shows the e-procurement is using in most of famous car manufacturing Company for providing of the parts from abroad and in some cases from Iran. Although all process of the e-procurement cannot do in Iran because of some lack in infrastructure which are needed such as e-payment or e-tendering. The main problem for e-payment is Iran banks sanction situation by Westerns countries.

2. What are the benefits of applying e-procurement in automotive B2B Company in Iran?
   The conclusion of this research shows the benefits of applying e-procurement in main famous car manufacturing Companies in Iran are 1- shortened procurement cycle time which is accepted by the all these Companies. 2- Reduce transaction and administration costs. Based on e-solution for these companies making the paperless system will make this benefit for companies.3- improved visibility of the customer demand and supply chain. 4- Rapid decision making 5- precise decision making.

   Based on our research in case of reduced operating and inventory which is suggested by the theory, it has rejected by most of them only Topco Company accepted.

3. What are the limits of applying e-procurement in automotive B2B Company in Iran?
   The conclusion of this research shows the limits of applying e-procurement in main famous car manufacturing Companies in Iran are 1- inadequate
technological infrastructure 2- Inadequate technological infrastructure of partners 3- lack of integration with Business partners and their co-operation 4- regulatory and legal controls

Based on our research in case of lack of skilled personnel only Sanaye Khodrosazi Kerman accepted this limit the rest did not accept it. Another case is about implementation costs which are accepted by none of them. Also Company culture which is presented by the theory is accepted by Zamyad and Sanaye khodrosazi kerman.

Moreover security is selected by two Companies such as Sapco and Sazeh Gostar Saipa. I think one the most important point is experience because of e-procurement is completely new subject still Companies did not touch enough experience related to the case. Beside upper manager support case due to universal attention of the B2B Companies mangers have enough enthusiasm for supporting the e-procurement implementation.

**Innovation in this study:**

As far as I did search, up to now, it has not done any research for evaluating the degree of applying e-procurement in Iranian automakers between these 5 biggest Companies besides this research investigated the benefits and barriers of applying e-procurement in mentioned Companies which seems it is exclusive!

**Application of research finding for Iranian auto makers:**

1- The new auto makers company whom they intend to apply e-procurement will understand the benefits and barriers which were for their competitors then they would be able to take them to their consideration for achievable faster conclusion.

2- The Iranian automakers Companies whom they applied e-procurement in their own Companies are able to understand their situation vs. their competitors and find the barriers which maybe happen for them in near future based on difficulties of first movers! Besides they can distinguish some more benefits which they did not attention to that and other competitors have achieved!
3- Also there is some conclusion for evaluating other foreign Companies who already applied e-procurement in their Companies that this research has brought them. This is why it would be beneficial for the future consideration for Iranian car manufactures too.

**Clear recommendation for investigated Companies:**

1- One of the e-procurement processes which are defined by theory is receiving proposal that all investigated Company do that only one exception who is Sanaye Khodrosazi Kerman. This research recommends them to do this process too for doing the whole e-procurement more perfect.

2- One of the problem in investigated Iranian automakers is none of them use e-payment in their e-procurement process they must take it to their consideration because based on NECCC (2002) idea they can shortened procurement cycle time.

3- According to Croom & Johnson 2003; Shaw and Subramaniam, 2002 the price benefits are derived as a result of better demand management capability of e-procurement system. Procurement costs are reduced through economies of supplier search and increased price competition among suppliers that is why this research recommend to mentioned Companies to revise the assessing of price benefits in applying e-procurement in their accounting enterprise.

4- This research encourages Topco, Sanaye khodrosazi Kerman & Sapco to investigate why applying e-procurement could not reduce transaction and administration cost although it has recommended by the theory and approved by Zamiyad and Saze Gostare Saipa!

5- This research recommend to Zamiyad, Saze Gostare Saipa, Sanayekhodrosazi Kerman, Sapco to investigate why applying e-procurement could not reduced operating and inventory cost although it has suggested by the theory and has accepted by Topco.

6- This research recommend to Zamiyad to assess why applying e-procurement could not make more rapid and precise decision making.

7- Also this research encourage mentioned enterprise to read all limitation which are defined by theory and accepted by Companies to take them to
their consideration for progressing in applying e-procurement in their organization.

Implication for further research:

Based on my model I found out some research issues related to e-procurement in Iran as new intention as followings:

- E-readiness of suppliers as well as main B2B Company.
- Preparation for ERP system in B2B Companies
- Make research for all process of e-procurement separately

Moreover I found out if any person wants to choose a title after checking the interested area from the written thesis they should refer to the end of every thesis for recommendation of more research. They can easily find the new ideas based on previous thesis beside they can continue for achieving new finding otherwise maybe lots of efforts without any useful result!

Limitation:

After describing the finding and related implications of this research in this section I explain limitations and troubles of doing this research while I was progressing in this case as below:

1. Tough regulation for achieving the Company information.
2. High security system in big company for enters to the factory and offices. If anybody wants to enter to any big manufactures first you have to have introduction formal letter from the university then you have to find the right person and place by phone otherwise you have to refer to the Company number of time. Access to the right by phone also is difficult because usually their line is busy!
3. Some of big B2B Companies has their own interested research title that is why based on their own regulation they are not allowed to reply any research questions or participate in any interview. They mentioned we support only our research subjects!
4. Low level of motivation for cooperating in research case in Iran based on cultural difficulties.
**APPENDIX A:**

**Blank Questionnaire**

**B2B Company Interview Guide**

**Company profile:**
- Name of the Company:
- Year of establishment:
- Type of ownership:
- Type of activity:
- Number of employees:
- Type of products:
- Number of suppliers:

**Respondent profile:**
- Respondent name & position:
- Respondent background & experience:

**Research Questionnaire:**

1. How long have you applied e-procurement in your company? One year
2. Please let me know, do you have below processes when you want to procure something electronically?
   a. Investigating supplier website for selecting the goods .................................................................
   b. Sending request for information ..................................................................................................
   c. Request quotation ..........................................................................................................................
   d. Receiving proposal ........................................................................................................................
   e. Receiving supplier data regarding quality certification, financial status or unique capabilities .................................................................................................................................
   f. Tender ................................................................................................................................................
   g. Purchasing requisitions ....................................................................................................................
   h. Sending the orders ............................................................................................................................
   i. E-payment .........................................................................................................................................
   f. Delivering the goods and services ...................................................................................................

3. Based on your experiences and your company attitudes, what are the advantages of applying e-procurement? And what are the main?
   a. Price advantages ............................................................................................................................
   b. Decreased procurement cycle times ..............................................................................................
   c. Decreased transaction and administration expenditure ....................................................................
   d. Improving the visibility of customer needs .....................................................................................
   e. Decreasing the costs of operating and stock ..................................................................................
   f. Rapid decision making ....................................................................................................................
   g. Intensify decision making ................................................................................................................

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4. Based on your experiences, what are the disadvantages of applying e-procurement in your company? And what are the main?
   a. Insufficient foundation of technology ........................................
   b. Insufficient partners' foundation of technology ..........................
   c. Deficiency of expert resources ....................................................
   d. Deficiency in merging system with partners and their co-operations ............................................................................................
   e. The cost of implementing .........................................................
   f. Company culture ........................................................................
   g. Lack of business processes for e-procurement support ...............  
   h. Legal and Controlling ................................................................
   i. Security ....................................................................................
   j. Senior management commitment .............................................

5. If you think of any barriers / disadvantages of e-procurement please let us know.

6. What will you suggest for the improvement of e-procurement?


**APPENDIX B:**

**Questionnaire:**

**SAPCO:**

Sapco is one of the leading companies in engineering designing and also supplying the parts for Iran Khodro. This Private Joint-Stock Company with 2000 employees and 500 supplying companies is activated in supplying parts for automobiles and so produces different kinds of automobiles.

1. How long have you applied e-procurement in your company? One year
2. Please let me know, do you have below processes when you want to procure something electronically?
   a. Investigating supplier website for selecting the goods................... ■
   b. Sending request for information................................................... ■
   c. Request quotation....................................................................... ■
   d. Receiving proposal....................................................................... ■
   e. Receiving supplier data regarding quality certification, financial status or unique capabilities........... (In the Section of Manufacturing of parts).................................................................................. ■
   f. Tender....................................................................................... □
   g. Purchasing requisitions............................................................... ■
   h. Sending the orders....................................................................... ■
   i. E-payment.................................................................................. □
   j. Delivering the goods and services................................................ ■
3. Based on your experiences and your company attitudes, what are the advantages of applying e-procurement? And what are the main?
   a. Price advantages........................................................................ □
   b. Decreased procurement cycle times........................................... ■
   c. Decreased transaction and administration expenditure............... □
   d. Improving the visibiliness of customer needs............................. ■
   e. Decreasing the costs of operating and stock............................... □
   f. Rapid decision making................................................................. ■
   g. Intensify decision making........................................................... ■
4. Based on your experiences, what are the disadvantages of applying e-procurement in your company? And what are the main?
   a. Insufficient foundation of technology........................................... ■
   b. Insufficient procurement foundation of technology..................... ■
c. Deficiency of expert resources........................................................................

☐
d. Deficiency in merging system with partners and their co-
operation...........................................................................................................

☒
e. The cost of implementing............................................................................

☐
f. Company culture.........................................................................................

☐
g. Lack of business processes for e-procurement
support............................................................................................................

☐
h. Legal and controlling...................................................................................

☒
i. Security..........................................................................................................  

☒
j. Senior management commitment...............................................................  

☐

5. If you think of any barriers / disadvantages of e-procurement please let us
know.

a. the speed of Internet in Iran is too low  

b. The market and stores are not familiar with Internet and Computer

6. What will you suggest for the improvement of e-procurement?

a. Improving the quality of internet especially the speed  

b. Making laws and regulation clear  

c. Providing the fields for improving the security of network and also the
digital signature

Zamyad:

Zamyad, (http://www.zamyadco.com) is one of the leading companies in
manufacturing automobiles since the 1340th / 1950th. This semi-governmental
manufacturing company with about 300 employees and with approximately 206
suppliers is one of the biggest companies in Iran. In this thesis I made my
interview with their supporting manager of purchasing who is Mr. Torki with 10
years experience in Trading.

1. How long have you applied e-procurement in your company?

Unfortunately It is not done except in some foreign purchasing.

2. Please let me know, do you have below processes when you want to
procure something electronically?

k. Investigating supplier website for selecting the goods.......................  

☒
l. Sending request for information.................................................................  

☒
m. Request quotation.......................................................................................  

☒
n. Receiving proposal.....................................................................................  

☒
o. Receiving supplier data regarding quality certification, financial status or unique capabilities .......................................................... ■
p. Tender ........................................................................................................... □
q. Purchasing requisitions ............................................................................. ■
r. Sending the orders .................................................................................. ■
s. E-payment .................................................................................................. □
t. Delivering the goods and services .............................................................. □

3. Based on your experiences and your company attitudes, what are the advantages of applying e-procurement? And what are the main?

h. Price advantages .................................................................................... □
i. Decreased procurement cycle times ....................................................... ■
j. Decreased transaction and administration expenditure ...................... ■
k. Improving the visibility of customer needs ........................................... ■
l. Decreasing the costs of operating and stock ........................................... □
m. Rapid decision making ........................................................................... □
n. Intensify decision making ....................................................................... □

4. Based on your experiences, what are the disadvantages of applying e-procurement in your company? And what are the main?

k. Insufficient foundation of technology .................................................. □
l. Insufficient partners' foundation of technology ..................................... ■
m. Deficiency of expert resources ............................................................... □
n. Deficiency in merging system with partners and their cooperation ........... ■
o. The cost of implementing ....................................................................... □
p. Company culture .................................................................................... □
q. Lack of business processes for e-procurement support .......................... ■
r. Legal and controlling ............................................................................... ■
s. Security .................................................................................................... □
t. Senior management commitment .......................................................... □

5. If you think of any barriers / disadvantages of e-procurement please let us know.

I do not think there would be any disadvantages but making the information becomes clear and in common in electronically affairs is
necessary which cannot be done according to the dominant culture in our industry.

6. What will you suggest for the improvement of e-procurement?

   a. improvement of the culture of e-procurement in common- because if some parts of the industry and some agencies do it and others don't, it won't be applicable.
   b. improvements in e-payment and e-banking
   c. training the managers and also inform them regarding the advantages of that, because without their support it cannot be applicable.

SazeGostarSaipa:

SazeGostarSaipa is a company which is mostly supplies the parts for automobiles and also does the engineering designing. This company with about 700 employees is one of the large companies in the field of supplying parts of automobiles. Also it has 700 manufacturers which supply this company. The person whom I interview is Mr. Ghasempoor who is the Domestic Commercial Manager of this company.

1. How long have you applied e-procurement in your company? We are using Internet, but with that name of e-procurement that is currently used no. 2. Please let me know, do you have below processes when you want to procure something electronically?
   a. Investigating supplier website for selecting the goods....................
   b. Sending request for information....................................................
   c. Request quotation........................................................................
   d. Receiving proposal........................................................................
   e. Receiving supplier data regarding quality certification, financial status or unique capabilities............................................................
   f. Tender........................................................................................
   g. Purchasing requisitions..............................................................
   h. Sending the orders........................................................................
   i. E-payment....................................................................................
   j. Delivering the goods and services................................................

3. Based on your experiences and your company attitudes, what are the advantages of applying e-procurement? And what are the main?
a. Price advantages
b. Decreased procurement cycle times
c. Decreased transaction and administration expenditure
d. Improving the visibiliness of customer needs
e. Decreasing the costs of operating and stock
f. Rapid decision making
g. Intensify decision making

4. Based on your experiences, what are the disadvantages of applying e-procurement in your company? And what are the main?
   a. Insufficient foundation of technology
   b. Insufficient partners' foundation of technology
   c. Deficiency of expert resources
   d. Deficiency in merging system with partners and their co-operation
   e. The cost of implementing
   f. Company culture
   g. Lack of business processes for e-procurement support
   h. Legal and controlling
   i. Security
   j. Senior management commitment

5. If you think of any barriers / disadvantages of e-procurement please let us know.
   a. the case of security in e-procurement
   b. the accuracy of the information which are available in electronic purchasing in websites

6. What will you suggest for the improvement of e-procurement?
   a. the formality of electronic signature
   b. the accountants consider validity for the electronically Invoices and their signature & stamps
   c. its legal laws becomes clear before implementing
Khodrosazan Rain Co:

This company (http://www.pac.ir/) is mostly activating in manufacturing automobiles especially Verna & Avante. This private company was established in 1382 /2004. This manufacturing company has 500 employees and the one whom I interviewed is Mr. Sepehr Ebkaiee who is the Commercial Manager.

1. How long have you applied e-procurement in your company? From the beginning

2. Please let me know, do you have below processes when you want to procure something electronically?
   a. Investigating supplier website for selecting the goods
   b. Sending request for information
   c. Request quotation
   d. Receiving proposal
   e. Receiving supplier data regarding quality certification, financial status or unique capabilities
   f. Tender
   g. Purchasing requisitions
   h. Sending the orders
   i. E-payment
   j. Delivering the goods and services

3. Based on your experiences and your company attitudes, what are the advantages of applying e-procurement? And what are the main?
   a. Price advantages
   b. Decreased procurement cycle times
   c. Decreased transaction and administration expenditure
   d. Improving the visibility of customer needs
   e. Decreasing the costs of operating and stock
   f. Rapid decision making
   g. Intensify decision making

4. Based on your experiences, what are the disadvantages of applying e-procurement in your company? And what are the main?
   a. Insufficient foundation of technology
   b. Insufficient partners' foundation of technology
   c. Deficiency of expert resources
   d. Deficiency in merging system with partners and their co-operation
   e. The cost of implementing
   f. Company culture
   g. Lack of business processes for e-procurement
   h. Legal and controlling
   i. Security
   j. Senior management commitment
5. If you think of any barriers / disadvantages of e-procurement please let us know.

6. What will you suggest for the improvement of e-procurement?

KhodrosaziBonyanToseSanat Pars (TOPCO):

This company (http://www.topco-ir.com/fa/home.aspx) was established in 1383/2005 and its being activating in manufacturing automobiles with Fiat brand name. This private company has about 300 employees and is working especially on the model, Fiat Siena. My interviewer was Mr. HosseinGolbidi who is member of Foreign Commercial department. Since 1362/1983 he has been working in Ministry of Commerce, Iran Khodro and above mentioned Company in various fields of Foreign Trading.

1. How long have you applied e-procurement in your company? From the beginning

2. Please let me know, do you have below processes when you want to procure something electronically?
   a. Investigating supplier website for selecting the goods....................... ■
   b. Sending request for information................................................... ■
   c. Request quotation................................................................. ■
   d. Receiving proposal............................................................... ■
   e. Receiving supplier data regarding quality certification, financial status or unique capabilities......................................................... ■
   f. Tender.................................................................................... ■
   g. Purchasing requisitions.......................................................... ■
   h. Sending the orders.................................................................. ■
   j. E-payment................................................................................ ■
   k. Delivering the goods and services............................................. ■

3. Based on your experiences and your company attitudes, what are the advantages of applying e-procurement? And what are the main?
   a. Price advantages........................................................................ ■
   b. Decreased procurement cycle times........................................... ■
c. Decreased transaction and administration expenditure

d. Improving the visibiliness of customer needs

e. Decreasing the costs of operating and stock

f. Rapid decision making

g. Intensify decision making

4. Based on your experiences, what are the disadvantages of applying e-procurement in your company? And what are the main?

a. Insufficient foundation of technology

b. Insufficient partners' foundation of technology

c. Deficiency of expert resources

d. Deficiency in merging system with partners and their co-operation

e. The cost of implementing

f. Company culture

g. Lack of business processes for e-procurement support

h. Legal and controlling

i. Security

j. Senior management commitment

5. If you think of any barriers / disadvantages of e-procurement please let us know.

6. What will you suggest for the improvement of e-procurement?

According to the Import & Export regulation law and also its executive regulation, importing goods must be according getting the permission from Trading Administration via opening L/C for the seller, so foreign purchasing from finding the sources to getting the Performa Invoice is done by internet, but in payment stage we cannot do it via internet and so the bank in Iran must open an L/C for the seller.
REFERENCES:


