

DOKUZ EYLÜL UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED
SCIENCES

B2B E-BUSINESS AND DEVELOPMENT OF A
B2B E-BUSINESS SOFTWARE

by
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İZMİR

B2B E-BUSINESS AND DEVELOPMENT OF A B2B E-BUSINESS SOFTWARE

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İZMİR**

M.Sc THESIS EXAMINATION RESULT FORM

We have read the thesis entitled “**B2B E-BUSINESS AND A DEVELOPMENT OF A B2B E-BUSINESS SOFTWARE**” completed by **Ümit TÜRKOĞLU** under supervision of **Prof. Dr. Alp KUT** and we certify that in our opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science.

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B2B E-BUSINESS AND DEVELOPMENT OF A B2B E-BUSINESS SOFTWARE

ABSTRACT

Traditional business concept is improved with the recent technological developments and gained a new and advantageous face, named as e-Business. It also easily enables the main purposes which are the increase of the total revenue and the decrease of the total cost. The more Internet became popular, the more B2B electronic business sector widely used. E-Marketplaces let even smaller scaled firms enter the market share and resulted with a larger business volume day by day.

Turkoglu E-Pazaryeri is designed as an electronic marketplace which gathers the buyers and sellers and let them to trade in an electronic environment. The program has web-based structure and user-friendly interface that provides significantly easy usage for users. System is simplified by eliminating the trivial details and massive contents and it let the user to focus on their own demands and shopping. Thus demanded and supplied products can be easily traded.

Keywords: Business, E-Business, B2B, B2C, EDI, XML, E-Marketplace.

B2B E-İŞ VE BİR B2B E-İŞ YAZILIMI GELİŞTİRİLMESİ

ÖZ

Geleneksel iş mantığı gelişen günümüz teknolojisinin etkisiyle farklı bir boyut kazanarak sanal ortama taşınmış ve e-iş adını almıştır. Ana hedefler olan kazanç arttırımı ve maliyet azaltması, e-iş sayesinde daha hızlı bir şekilde gerçekleşmiştir. İşletmeler arası e-iş modeli günümüzde özellikle internet kullanımının da yaygınlaşmasıyla, çok önemli bir noktaya gelmiştir. Elektronik pazaryerleri sayesinde, nispeten daha ufak ölçekli şirketlerin de pazaryerine dahil olmasıyla toplam iş hacmi her geçen gün artmaktadır.

Turkoglu E-Pazaryeri alıcılar ile satıcıları bir araya getirmek ve tüm alışveriş işlemlerini elektronik olarak yapmalarını sağlamak üzere tasarlanmış elektronik pazaryerleri modeline bir örnektir. Web tabanlı programın sade ve basit arabirimi sayesinde üyelerine ciddi anlamda kullanım kolaylığı sağlar. Bu sayede üyeler gereksiz ayrıntılarda ve yoğun içerikte boğulmadan sadece alışverişlerine ve ilgili taleplere konsantre olurlar. Böylece hem satmak hemde almak istedikleri ürünler için kolaylıkla pazar bulabilirler.

Anahtar Sözcükler: İş, E-İş, B2B, B2C, EDI, XML, E-Pazaryeri.

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CHAPTER ONE

INTRODUCTION

Developing technology replaces the classical and traditional systems everyday almost in every part of life with a modern solution. Improvement brings more practical, more efficient and more advantageous alternatives for existing habits.

Among numerous systems, business sector has a special role due to its importance. According to its classical definition in economics, business is the social science of managing people to organize and maintain collective productivity toward accomplishing particular creative and productive goals to generate revenue and to maximize profit. It can be considered as being busy with a commercially viable and profitable work.

Modernized solution for business is firstly defined as e-Business by IBM authorities in 1997. Electronic business is the realization of a business transaction using computers and technological tools which are connected through a network. The main advantageous renovations brought with electronic environment are higher reachable property of a wider market, new sales opportunities, more efficient customer services, low procurement marketing and sale costs with low cycle time.

The “e-” prefix labels the more modern and efficient version of the system, as it is in “**Turkoglu E-Pazaryeri**”, brand name of the program that I generated for my thesis study.

E-business contains several sub-branches which will be investigated during my thesis study. Moreover, Turkoglu E-Pazaryeri is programmed to extend the *business to business electronic marketplace cell* of the whole e-Business tree.

Turkoglu E-Pazaryeri aims to be beneficial for all sellers and buyers. Advantageous renovations for sellers are lower costs, new customers and close collaboration among partners. Similarly, buyers expect direct and indirect supply

chain cost reduced and the overall performance of the manufacturing and procurement processes are improved.

CHAPTER TWO

UNDERSTANDING E-BUSINESS

2.1 What is Business?

The term business means broadly to any commercial, financial and industrial activity performed by firms. A business can entail a wide range of activities such as product development, marketing, planning, procurement, manufacturing, customer service, accounting, infrastructure management, human resource management, and so forth.

A typical business consists of several primary and supporting functional units that together enable the business to run its operations smoothly. For example, a service organization may have one unit that serves its clients and another unit that stores client information and data. A service organization may also have units for human resources, information systems and finance that in turn support its primary functional units. All units in an organization work together to provide customer value and satisfaction.

To provide additional value to its customers, a business must also interact closely with its vendors. For this reason, many businesses are now moving toward electronic business as a means of facilitating business-to-business transactions. In addition to closer interaction among firms, electronic business also provides faster communication, practical trading and lower cost for both sides which emphasizes maximizing profit aim at any business.

2.1.1 The Concept of Value Chain

The principal activities of a typical business are the design, production, marketing, delivery, and support of its product(s) or service(s). Each of these activities adds cost and value to the product or service that is eventually delivered to the customer. The chain of activities directed toward increasing customer satisfaction is called a value

chain. The following illustration depicts the principal activities performed in most businesses.

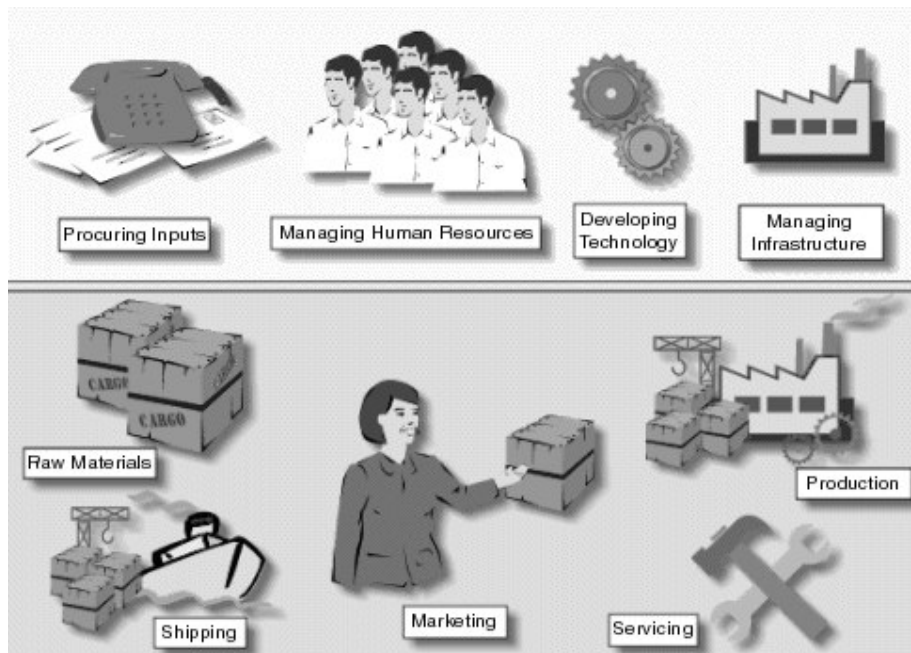


Figure 2.1 Principal activities in most businesses.

2.1.1.1 Value Chain

A value chain identifies five primary and four supporting activities that add cost and value in a business. In a manufacturing business scenario, the primary activities are:

1. Acquiring raw materials.
2. Converting raw materials into finished products.
3. Shipping finished products to retailers or distributors.
4. Marketing products.
5. Servicing products.

In the same business scenario, the support activities are:

1. Procuring various inputs for each primary activity.

2. Developing technology.
3. Managing human resources.
4. Managing infrastructure.

The purposes of a typical business are creating shareholder value, creating customer value, maintaining market dominance, creating employment but mainly generating revenue and generating profit. Two important actions to maximize profits are increasing revenues and decreasing costs. Revenue is the price of one good times by the number of the products sold. Thus total cost equals number of products times by cost of single good.

$$\text{Profit} = (n * P) - (n * c) \quad \text{Eq 2.1}$$

$$\text{Profit} = \text{Total Revenue} - \text{Total Cost} \quad \text{Eq 2.2}$$

As shown in equations 2.1 and 2.2, profit is the difference of total revenue and total cost. The higher the difference is the more profit gained. Hence, a firm can maximize profits in one or both ways by shifting these two variables:

- By increasing revenues:
 - By creating new products or services.
 - By entering new markets.
 - By selling more of the same products to existing customers.
 - By selling complementary products of services in addition to products.
- By decreasing costs:
 - By lowering human labor costs.
 - By lowering operational costs.
 - By reducing discretionary expenses such as advertising.
 - By lowering infrastructure costs.

Recent technology can be applied to daily business to improve the quality and reduce the costs. For instance, a better way of making profits is by using the Internet

to decrease costs. Specifically, an intranet-based standardized infrastructure can substantially lower network management costs; Internet-based workflow scheduling can make people more productive by giving them the tools and information to make better and faster decisions. Consequently, Internet-based procurement is roughly 5-20% less expensive than traditional human agent-based procurement. Thus, e-Business concept is generated recently.

2.2 What is E-Business?

The term e-Business is defined as the use of electronic means to conduct an organization's business internally and/or externally (Jelassi & Enders, 2004). E-Business is the undertaking of a business transaction using computers connected through a network. In simple form, e-Business is "doing business electronically" (Kalakota & Robinson, 2000). Electronic business (e-Business) includes everything having to do with the application of information and communication technologies to the conduct of business between firms, within firms, or from firm to consumer. It is a more generic term than e-Commerce because it refers to not only buying and selling, it includes both commerce (buying/selling) and non-commerce activities, such as providing information, interaction, collaboration in new product development, and so forth.

IBM, in 1997, was one of the first to use the "e-Business" term when it launched a campaign built around the term. Today, many corporations are rethinking their businesses in terms of the Internet and its capabilities. Companies are using the web to buy parts and supplies from other companies, to collaborate on sales promotions, and to do joint research. Exploiting the convenience, availability, and global reach of the Internet, many companies, both large and small have already discovered how to use the Internet successfully.

2.3 E-Business vs. Traditional Business

The web is changing every aspect of our lives, but no area is undergoing as rapid and significant change, as the way businesses operate. As businesses incorporate Internet technology into their core business processes, they start to achieve real business value. Today, companies large and small are using the web to communicate with their partners, to connect with their back-end data systems, and to transact commerce. This is where the strength and reliability of traditional informational technology meet the Internet. E-Business has three elements that differentiate it from traditional business:

- 1. Knowledge exchange and processing:** With e-Business, many different individuals, organizations or departments within organizations are able to exchange and process information rapidly. This enables companies to have a better understanding of their customers and business partners. Electronic communication can provide a common platform or language for computers to exchange information. Once information has been exchanged, it can be processed more efficiently as well. This means it can be processed more accurately, more quickly and far less expensively than through traditional means. Many business services, such as statistical reporting, ordering, and inventory and order control systems can benefit from the continual increase in the processing speed of today's computers. This increased speed allows companies to better react to changes that take place.
- 2. Physical proximity and time:** E-Business allows parties to communicate and transact business without being in the same physical location. The concept that the importance of physical proximity between buyer and seller is less crucial than other business factors like price, product features, responsiveness and service. Additionally, communications and transactions may take place at any time. As a result, small and medium-sized businesses are able to reach new, potentially far-flung markets at a

low cost around the clock. One drawback of this element is the necessity to incorporate effective security measures to promote secure transactions.

3. **Mass customization:** E-Business can facilitate a new model of production commonly referred to as mass customization. Mass customization means that producers can offer, and consumers may demand, products and services tailored to their particular tastes. The "one size fits all" mentality of traditional commerce is replaced with customized production made possible by e-Business. E-Business allows companies to use information technologies to create products and experiences for their customers that differ from competitors' products and services. For instance, companies such as Dell computers build products to specification based on information provided by customers. Other companies use methods of capturing customer preferences and patterns to create a personalized experience each time the customer returns to use the company's web site.

2.4 What is E-Commerce & Internet Commerce?

Commerce is the exchange of goods or services between parties using money or a barter system. Electronic commerce is doing business online (Loshin & Vacca, 2004). Other words e-Commerce is commerce via interconnected electronic networks. Multiple users (buyers and sellers) use electronic networks to transmit information that can facilitate the operations.

E-Commerce is a subset of e-Business directly concerned with buying and selling activities. This includes advertising of products or services, online shopping, and after-sales support, but not new product development or information access. On the other hand, e-Commerce may or may not be conducted over the Internet.

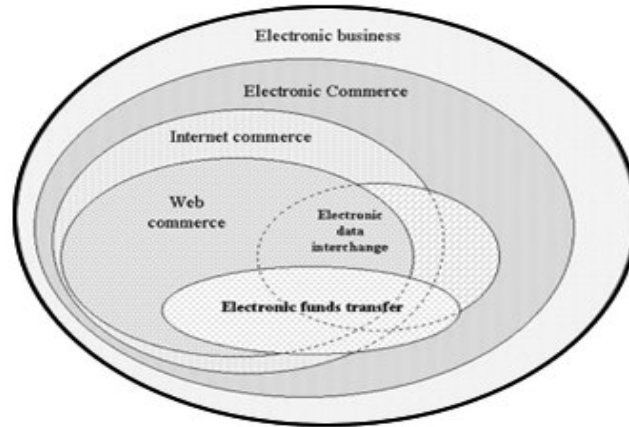


Figure 2.2 Graphical schema of structure.

Internet commerce is a subset of e-Commerce that is conducted over the Internet. Much of today's business-to-business electronic commerce is still conducted over private networks using traditional EDI channels and value-added network (VAN) services. This is not Internet commerce. Of course, the big reason for doing the same over the Internet is to lower costs. Internet commerce done over the web is called web commerce, and some Internet commerce is done using non-web means such as e-mail, file transfer.

The two other entities in the above Figure 2.2 are electronic data interchange (EDI) and electronic funds transfer (EFT). EDI is the business-to-business exchange of documents such as purchase orders, invoices, bill of materials, and shipping documents in industry-wide standardized formats. It preceded modern day e-Commerce by about two decades and may or may not involve funds transfer. EFT, in comparison, involves electronic transfer of funds between two interacting parties (firms, individuals, or financial institutions), typically for goods or services rendered. EFT may be executed using EDI standards or in a non-EDI manner. Both EDI and EFT can be done electronically, over the Internet (or over private networks like VAN), or via the web.

CHAPTER THREE

INTRODUCTION TO B2B E-BUSINESS

3.1 Types of E-Business

There are many different categorizations of e-Business. The most widely used is B2C (business-to-consumer) and B2B (business-to-business).

3.1.1 Business-to-Consumer E-Business (B2C)

Business-to-consumer (B2C) is a form of electronic business in which products or services are sold from a firm to a consumer. B2C e-Business refers to the emerging commerce model where businesses /companies and consumers interact electronically or digitally in some way. One of the best examples of B2C e-Business is Amazon.com, an online bookstore that launched its site in 1995.

In a B2C e- Business the focus is more about enticing prospects and converting them into customers, retaining them and share value created during the process. The ultimate goal is the conversion of shoppers into buyers as aggressively and consistently as possible.

In a typical B2C flow of information between business and consumer typically is through the medium of Internet (Figure 3.1). This flow includes product orders/service requests from customers, product information, specifications, providing of services by business etc. In addition, it may also include, flow of tangibles (e.g. goods ordered from customer, documents transfers between business and customer etc.)

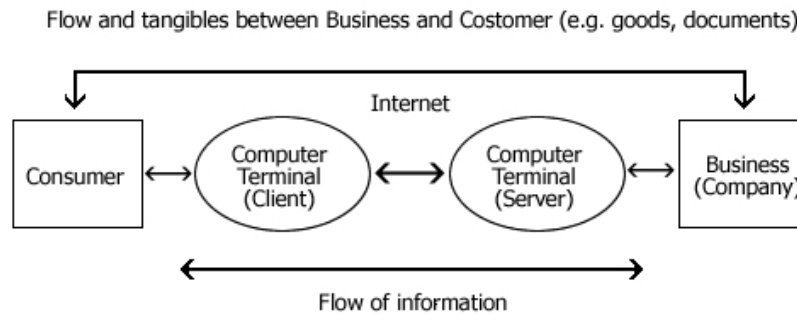


Figure 3.1 Typical B2C enabled by internet.

3.1.1.1 B2C e- Business Models

- Auction stores (e.g. ebay.com)
- Online stores (e.g. amazon.com)
- Online services (e.g. eTrade.com)

3.1.1.1.1 Auction Stores. Electronic auctions offer an electronic implementation of the bidding mechanism also known from traditional auctions. This can be accompanied by multimedia presentation of the goods. Usually they are not restricted to this single function. They may also offer integration of the bidding process with contracting, payments and delivery. The sources of income for the auction provider are in selling the technology platform, in transactions of a collection of e-shops, usually enhanced by a common umbrella, for example of a well-known brand. It might be enriched by a common guaranteed payment method (Timmers, 1998).

There are some advantages and disadvantages of Internet auctions (Lucking-Reiley, 1999):

- Advantages:
 - *Convenience:* It gives the participants convenience as bidder can stay at his home or office and still participate in the bidding just as in traditional auctions. In addition, it is also more convenient for a bidder to find more about the goods being auctioned.

- *Flexibility:* Traditional auctions allow only synchronous bidding requiring all bidders to participate at the same time. In contrast, Internet auctions allow asynchronous bidding lasting days or weeks, which offers more flexibility to the bidders.
- *Increased reach:* The potential of reach of an Internet based auction site is global and thus the market for auctioned good is very large.
- *Economical to operate:* These are cheaper to run as lot of costs relating to infrastructure required for a conventional auction system is not necessary for this.
- Disadvantages:
 - *Inspection of goods:* In an Internet based auction, it is not possible to physically inspect the goods. The bidders have to rely on the information provided or sometimes, may have to rely on some electronic images of the goods on auction.
 - *Potential for fraud:* Internet bidder has to trust that the seller would actually send the good for which he paid. Also typically payments are made by providing credit card details through the Internet, which may also be always safe.

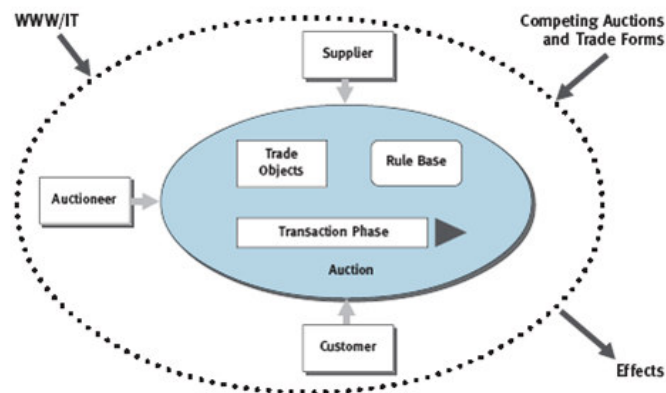


Figure 3.2 Model of electronic auctions (Klein, 1997).

3.1.1.1.2 Online Stores. It refers to marketing of a company's products through the web. It may be done either to promote the company and its products and services or to actually sell the products/services through this virtual store. One of the best examples of an e-store is Amazon.com, which started selling books online and gradually extended to other product categories. The benefits of the online stores can be classified into two categories (Timmers, 1998).

- Benefits for the company
 - Increased demand
 - A low-cost route to global reach
 - Cost-reduction of promotion and sales
 - Reduced costs
- Benefits for the customers
 - Lower prices
 - Wider choice
 - Better information
 - Convenience

Shopping through the online stores is fast gaining popularity and acceptance. Although majority of the revenue is in the B2B sales, B2C sales are also expected to improve in the coming years. However, for this to occur, online stores need to deliver far more value to the customers and at the same time find new ways to generate revenues (Mukund, 2005).

Delivering value to customers, in order to develop more value to the customers, the following may be considered (Mukund, 2005).

- Merchants have to try to find ways to gain competitive advantage in factors other than just the price.
- Online shops need to provide a shopping-experience that addresses all of the customer's requirements. It should also try to provide an environment that is easy to explore.
- Expansion of the range of services

- Find cost-effective ways to increase customer base and generate higher revenues

New ways to generate revenues, one of the key problems which the online stores face is the lack of a good and effective revenue model. Online stores therefore have to explore new ways to generate revenues (e.g. collect membership fees from customers).

3.1.1.1.3 Online Services. This is another area where companies can exploit Internet. Many companies are using Internet to provide customer service. In service sector banking and stock trading is one such example. Companies like eTrade.com have brought the ease of trading stocks to customer's PC.

3.2 Business-to-Business E-Business (B2B):

Business-to-business (B2B) refers to a broad range of intercompany transactions, including wholesale trade as well as company purchases of services, resources, technology, manufactured parts and components, and capital equipment. B2B e-Business is all about automating the processes used by buyers and sellers to conduct business. B2B also includes many types of financial transactions between companies, such as reinsurance, commercial credit and electronic networks for trading bonds, securities and other financial assets. B2B transactions exclude those involving households, such as retail sales, interconsumer exchange, and employment.

3.2.1 Benefits of B2B

B2B e-Business provides the benefit of business process integration. For example, a purchasing department acquires a product catalog from a vendor and makes the product catalog available to users on an intranet. Users look at the catalog and order the products. The process of ordering the product and generating bills accordingly is automated. The amount the users can order is also defined and is a part of the

automated process. The following figure depicts the five major advantages of implementing e-Business.

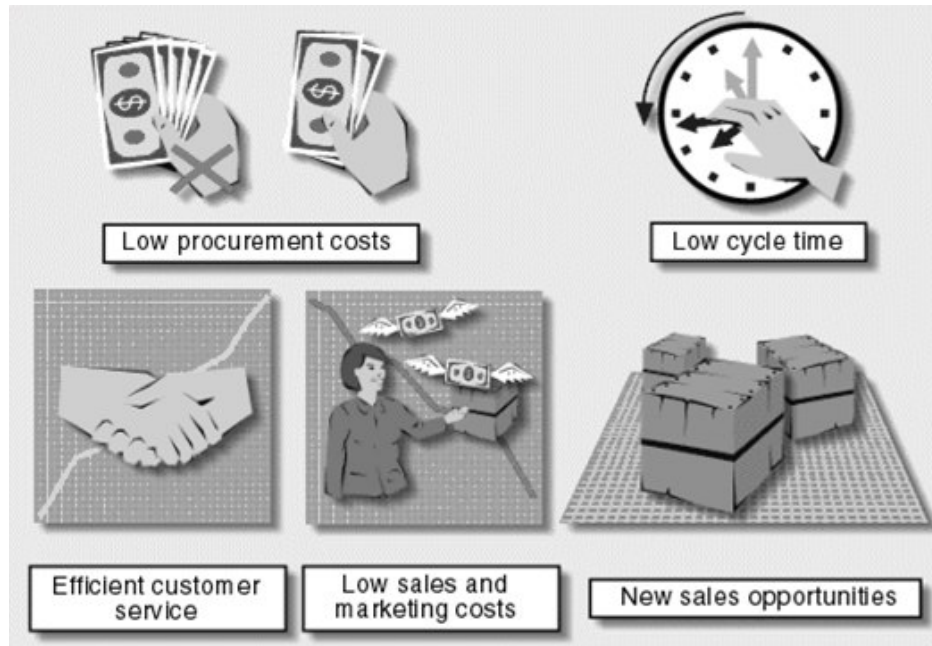


Figure 3.3 Benefits of B2B.

Until recently, only larger businesses could take advantage of e-Business in their operations. Today, however, the rise of the Internet has made e-Business practical and affordable for small-scale businesses as well. Organizations of all sizes can now communicate with each other electronically not only by using the Internet but also intranets, extranets, or private value-added networks.

- **Low procurement costs:** Businesses lower their procurement costs by developing relationships with key suppliers in order to benefit from volume discounts. The Internet now makes it possible to conduct business electronically with new suppliers and with small and medium-sized suppliers who often can provide materials at lower cost. The Internet also reduces processing costs and opens up new sales opportunities from buyers who post bid requests online.
- **Low cycle times:** By establishing electronic links with their suppliers and customers, businesses can transmit and receive purchase orders, invoices, and shipping notifications with shorter lead times. Electronic linkage with

suppliers, vendors, and customers also enables businesses to maintain minimal inventory, greatly reducing related costs.

- **More efficient customer service:** Businesses that engage in e-Commerce provide online information about products, technical support, and order status. This saves money by freeing up customer service staff to handle more complicated questions and manage customer relations. The availability of online information also leads to satisfied customers who appreciate ease of access.
- **Low sales and marketing costs:** Conducting business over the Internet can attract new customers without adding costs. This is because the sales function of the business resides on a computer server rather than in physical store locations or with salespeople. The reach of the business is restricted only by the capacity of the servers it uses to respond to inquiries and orders.
- **New sales opportunities:** The Internet operates around the clock and around the world, so businesses with an online presence can reach out to new markets that cannot be reached effectively with a traditional sales force or through advertising campaigns. By having an online presence and creating customized services for the business market, vendors can develop profitable new markets, both locally and globally.

3.2.2 Models of B2B E-Business

In B2B computing, you can choose to implement one or more of the three models: Buy-Side, Sell-Side and E-Marketplace (Figure 3.4).



Figure 3.4 B2B models.

3.2.2.1 Buy-Side Model

The buy-side solution, also known as one buyer-to-many sellers scenario, restructures the procurement process within a company. Most companies have typically adopted buy-side solutions as a way to have a consistent, entity-wide procurement system. In this model, multiple catalogs and specific items within those catalogs, along with negotiated prices and any necessary preauthorization are consolidated to provide a consistent interface to the company's buyers. The buy-side application also includes workflow for the procurement approval process and is connected only to pre-approved vendors (sellers) and their e-catalogs. The buy-side application might aggregate multiple sellers' catalogs and provide different views to different buyers within the organization. Sellers usually provide special pre-negotiated (contract) prices to buyers. The buy-side model should be integrated with the company's back-end applications such as purchasing, material requirements planning, or enterprise resource planning. The benefits are to lower overall cost for supplies and to reduce transaction costs. The buy-side application automates and streamlines the approval process and reduces the paperwork associated with purchase orders and purchase contracts. To reduce transaction costs means that manual processing of purchase orders are eliminated. It arranges more guaranteed and predictable sales through negotiated contracts with buyers.

3.2.2.2 Sell-Side Model

The sell-side model is referred to as many buyers-to-one seller scenario. The most common implementation of a sell-side B2B application is the posting of a catalog of items on the Internet that is available to the other businesses. In this B2B model, the buyers are not end consumers, but distributors buying from manufacturers. The seller replaces or supplements the normal ordering process (telephone, e-mail, fax, regular mail) with a Web-based buying alternative. Seller usually provides a "shopping" Web site with an e-catalog. Buyers usually shop directly on the seller's site using a Web browser. Common e-Commerce capabilities are usually implemented, such as cross-selling with different complementary products or up-selling by a higher priced alternative with more features or better quality. Business-to-business payment terms and methods such as Bank Direct Debiting System are also supported. The Sell-side Model reduces expenses and increases accuracy in processing orders. It paves the way of reaching a larger customer base and broader geography.

3.2.2.3 E-Marketplace Model

B2B marketplaces (E-Marketplace, E-Hub, B2B Exchange), are commerce sites on the public Internet that allow large communities of buyers and suppliers to "meet" and trade with each other. They present ideal structures for commercial exchange, achieving new levels of market efficiency by tightening and automating the relationship between supplier and buyer. They allow participants to access various mechanisms to buy and sell almost anything, from services to direct materials.

B2B marketplaces are playing a crucial role in today's digital economy. E-Marketplaces are building capabilities to host critical supply chain applications, providing support to cross enterprise collaboration. This allows companies to synchronize activities like product design, procurement, transportation planning, production planning and marketing. E-Marketplaces provide the participants with an open, flexible, reliable, highly available, and scalable environment. Its functionality

spans array of capabilities that cross business processes delivering the greatest value to the customer, industry, or groups of customers and industries.

E-marketplaces create value for participants (buyers and sellers) in two ways:

- *Aggregation*: Aggregation refers to bringing multiple buyers and/or sellers in one virtual location to lower transaction costs by spreading them over a larger number of players. Pricing is fixed. If the exchange consists of one buyer and many sellers, competition among sellers can lower purchase price for the buyer. If the exchange has many buyers and one seller, bulk volume purchase can also drive down purchase price. In other words, the goal of aggregation is to lower cost of purchase (both purchase price and transaction cost).
- *Market-making*: This refers to the process of discovering potential buyers and sellers and/or negotiating pricing on desired items on a real-time dynamic basis. The focus of market making is to improve market efficiency, particularly for perishable products with inefficient markets, and price discovery, as opposite to lowering price as in aggregation.

3.2.2.3.1 Types of B2B E-Marketplaces. There are two business dimensions of e-Marketplaces. They can specialize vertically along a specific industry or market, or it can specialize horizontally along a specific function or business process (Kaplan & Sawhney, 2000).

Vertical Dimension: E-Marketplaces that have a vertical dimension span vertically up and down every segment of one specific industry. Each level of the industry has access to every other level, which greatly increases collaboration. Buyers and Sellers in the industry are connected to increase operating efficiency, and decrease supply chain costs, inventories, and cycle times. This is possible because buying/selling items to customers in a similar industry standardizes needs, therefore reducing the need for outsourcing many products.

Horizontal Dimension: E-Marketplaces that have a horizontal dimension connect buyers and sellers across many industries. The most common type of materials traded horizontally across industries are MRO's (Maintenance, Repair, and Operations materials). These items are so popular because they are crucial to the daily running of a business, no matter what industry (or what level of that industry) the firm is in.

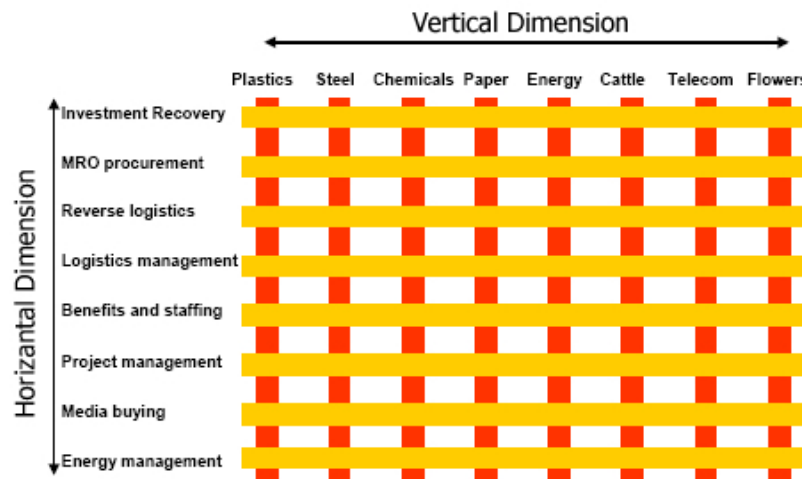


Figure 3.5: Vertical vs. horizontal dimensions.

B2B hubs (e-Marketplaces) can be classified into four categories (Kaplan & Sawhney, 2000):

- MRO hubs (operating supplies, systematic sourcing, horizontal focus)
- Yield managers (operating supplies, spot sourcing, horizontal focus)
- Catalog hubs (manufacturing inputs, systematic sourcing, vertical focus)
- Exchanges (manufacturing inputs, spot sourcing, vertical focus)

This categorization is based on understanding of what companies buy and how they buy. Business purchases can be classified into two broad levels: Manufacturing inputs and operating inputs. *Manufacturing inputs* are raw materials and components that go directly into the products or process. *Operating inputs* are not parts of finished goods but include things like office supplies, spare parts, and airline tickets. These are often called maintenance, repair and operating (MRO) goods. The second aspect is how businesses buy products and services. They can follow either

systematic sourcing or spot sourcing. *Systematic sourcing* involves negotiated contracts. These arrangements involve long-term relationship between buyer and seller. In *spot sourcing* case buyer's objective to fulfill an immediate need at the lowest possible cost. This does not involve any long-term relation between buyer and seller.

- **MRO (Maintenance, repair and operating hubs):** These hubs concentrate on goods with low value. The transaction cost is relatively higher. These hubs provide value by increasing the efficiency in the procurement process. These hubs use third party logistics supplier to deliver goods, thus enabling them to disintermediate or bypass existing middlemen in the channel.
- **Yield Managers:** This type of hubs creates spot markets for common operating resource like manufacturing capacity, labor or advertising. This functionality allows the companies to expand or contract their operations at a short notice. Yield managers add great value in situations where there is high degree of price and demand volatility, and where fixed assets cannot be liquidated or acquired quickly.
- **Catalog Hubs:** These are industry specific hubs that bring many suppliers together at one easy-to-use web site. These hubs automate the sourcing of non-commodity manufacturing inputs and create value by reducing transaction costs. Catalog hubs can be either buyer focused or seller focused for example some hubs would work as distributors for suppliers while others would work for buyers in their negotiations with sellers.
- **Exchanges:** Online exchange allow purchasing manager to effectively manage peaks and ebbs in demand and supply by allowing them to exchange commodities or near commodities for production. These exchanges maintain relationships with buyers and sellers, making it very convenient for business to conduct business over exchanges. In many case buyers and sellers never even see each other.

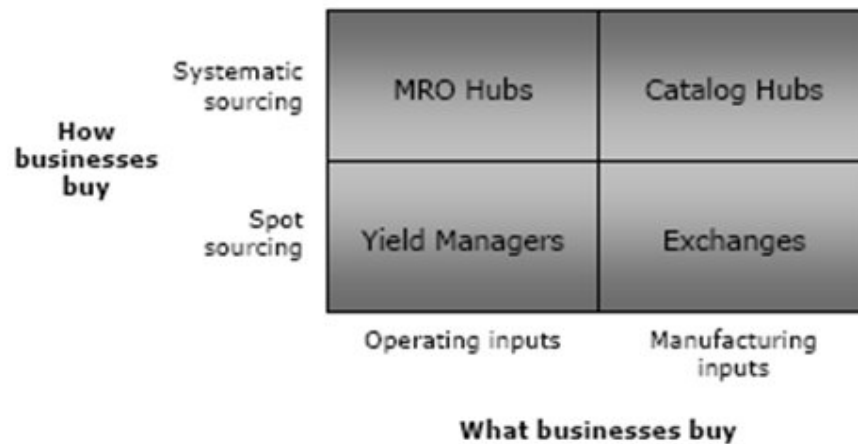


Figure 3.6 Classifying B2B hubs.

3.2.2.3.2 *Benefits of E-Marketplaces.* There are several benefits of B2B Marketplaces for sellers, buyers and market makers;

Sellers use B2B eCommerce to lower costs and access new customers. Marketplaces extend that reach still further by creating and leveraging close collaboration between trading partners, tightening the relationship between supplier and buyer, promoting price discovery and spend aggregation and slashing supply chain costs.

Buyers can use B2B marketplaces to reduce direct and indirect supply chain costs by leveraging their global scale, focusing their spend on preferred suppliers, and taking advantage of dynamic models such as auctions and bid-quote for efficient sourcing and spot buying. Beyond leveraging spend, new tools for logistics, payment and tax create new opportunities to build transparency in the supply chain, decrease logistics costs, increase inventory turns, and improve the overall performance of the manufacturing and procurement processes, returning 15-27% back to the business in reduced costs.

Market makers are the fulcrum of these new B2B eCommerce relationships, catalyzing the growth of the B2B economy by leveraging their domain expertise, customer relationships and supply chain strength to fuel the growth of B2B marketplaces. In return for delivering incredible value, market makers stand poised to reap substantial rewards by sharing in the returns achieved by buyers and suppliers.

CHAPTER FOUR

B2B FRAMEWORKS

4.1 Understanding EDI

EDI can be defined as electronic exchange of structured and normalized data between computer systems of different partners. In other words EDI is computer-to-computer exchange of structured information, by agreed message standards, from one computer application to another by electronic means and with a minimum of human intervention.

In common usage, EDI is understood to mean specific interchange methods agreed upon by national or international standards bodies for the transfer of business transaction data, with one typical application being the automated purchase of goods and services.

Before B2B there was Electronic Data Interchange where e-Business truly began. By using EDI, a company could build electronic communication and business transaction systems that processed orders and transferred invoices between organizations. The pure EDI architecture is too cumbersome for the web because transactions were direct computer-to-computer links from a database on one mainframe to another database on a mainframe in a different organization. The interactions were transacted over privately leased lines as opposed to the open web networking.

The use of electronic document has some advantages to paper documents besides reducing the paperwork. Because no data is re-keyed from document into a computer system no errors can occur in the passed data between business partners. These inaccuracies in messages passed between humans cause delays and additional costs incur if orders or requests are executed wrong. With electronic documents these ambiguities disappear leading to more certain supply chains, shorter lead times, lower stocks all resulting in a better service provided to the customer. EDI systems

can always be available contrary to the office ours with human involved systems. EDI is said to make the business processes more streamlined driving efficiencies across the company's boundaries.

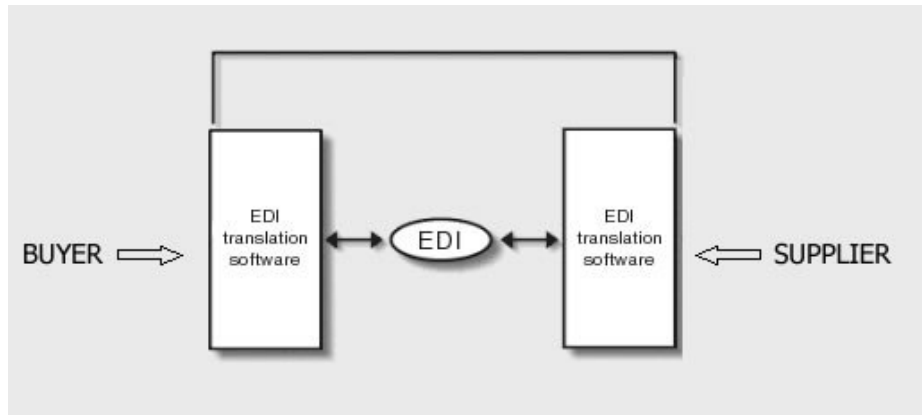


Figure 4.1 Basics of EDI.

4.1.1 EDI history and standards

Most documents about EDI trace its history back to 1948 to Berlin Airlift where the task of coordinating air freighted consignments of food and consumables (which arrived with differing manifests, languages and numbers of copies) was addressed by devising a standard manifest (Clarke, 1998).

- **1960-s:** In the USA we see in the 1960-s the first electronic transmission in transport industries with lots of proprietary standards⁷ lead to the foundation in 1968 of the United States Transportation Data Coordinating Committee (TDCC). At the other side of the Atlantic the Department of Customs and Excise of the UK was also developing a standard called Tradecom. This standard was later extended by United Nations Economic Commission for Europe (UN-ECE) into the General purpose Trade Data Interchange Standards (GTDI).
- **1970-s:** With the 1970-s the general acceptance of EDI came. TDCC translated the available proprietary standards into one, 1974-1975. The first implementations were realized in the hospital supply and grocery

industry. TDCC's efforts provided the basis for the X12 standard of ANSI realized in the period 1978-1988.

- **1980-s:** The use of EDI increased dramatically and implementations in automotive industry were realized. The transatlantic differences were cleared in the United Nations Joint Electronic Data Interchange Committee (UN-JEDI) revising the EDI data element dictionary, 1983-1984, that lead to widespread EDI For Administration, Commerce and Transport (EDIFACT) standard, 1985-1988. Also government bodies became increasingly interested in EDI.
- **1990-s:** EDIFACT is considered one of the driving factors of the European unification.
- **Now:** Currently there are tree dominant EDI standards:
 - W. Europe: EDIFACT (sub-standardized in UK-TRADECOMS, EANCOM and Simplified)
 - North America: ANSI X.12
 - Australia and New Zealand: United Nations Trade Data Interchange (UNTDI)

4.1.2 EDI terminology

EDI defines the formats, data types, and routing instructions for the electronic exchange of business documents between different companies' computer systems. These transactions typically are carried out over a Value Added Network. A value-added network (VAN) is a specialized application service provider (ASP) that acts as an intermediary between trading partners sharing data or business processes. EDI eliminates the burden of paper purchase orders, invoices, shipping forms, and other documents and replaces them with electronic equivalents. This can slash processing costs by a third to a half.

Among the terms used in an EDI implementation are trading partners, electronic envelopes, and EDI translation software.

- **Trading partners:** Organizations that send or receive documents from each other are referred to as "trading partners" in EDI terminology. The trading partners agree on the specific information to be transmitted and how it should be used. This is done in human readable specifications (also called specs or spec sheets). While the standards are analogous to building codes the specifications are analogous to blue prints. (The specification may also be called a mapping but the term mapping is typically reserved for specific machine readable instructions given to the translation software.) Larger companies have existing specification sheets and are usually unwilling to negotiate. Often in a large company these sheets will be written to be used by different branches or divisions and therefore will contain information not needed for a particular exchange. (Deviations from and clarification to the specification sheets should always be obtained in writing.)
- **EDI translation software:** EDI translation software provides the interface between the internal system and the common standards. It converts data from its native format into an EDI transaction set before it is sent across the network. Upon receiving an EDI transaction set, the EDI translation software converts the data back to its native format.
- **Electronic envelopes:** Information travels over the Web in electronic envelopes. Upon receiving an electronic envelope, a computer looks for specific key entries in order to identify pieces of information. These key entries are as follows:
 - An ISA (Instrument Society of America) declaration indicates the beginning of the envelope. An IEA declaration indicates its end.
 - An envelope may contain one or more functional groups. The beginning and end of each functional group is indicated by the GS (group start) and GE (group end) declarations, respectively.
 - Functional groups store EDI transaction sets. The ST, or transaction set header declaration, indicates the start of the transaction set, which is the equivalent of a paper document. The

SE, or transaction set trailer declaration, identifies the end of the transaction set.

The following (Figure 4.2) is an example of an electronic envelope. ISA, IEA, GS, GE, ST, and SE declarations in the envelope.

```

ISA*00*00*01*0860603544*08*6113240000*940608*0902*U*00303*00E
0000451*0*P>~
      GS*IN*086063544*6113240000*940608*0902*1156*X*003030~
        ST*850*6541~
          BEG*00*SA*09935600*990707~
          NTE**GOODS SHIPPED PER EDI INSTRUCTIONS~
          REF*1A*053445~
          CSH*P2~
          DTM*010*990707~
          DTM*001*990707~
          TD5*****1-200 COPIES~
          TD5*****201+ MICROSOFT~
          N1*BY*92*08995~
          PID*F*99***2T - 4T~
        SE*15*6541~
      GE*1*1156~
    IEA*1*000451~
  
```

Figure 4.2 Example of an electronic envelope.

4.1.3 The Flow of Information in an EDI Business Transaction

EDI helps streamline the basic transaction flow between trading partners by replacing all paper documents with their electronic equivalents. Because EDI documents are transferred electronically, mailing costs and order time are reduced. EDI ensures greater reliability of data because data can be entered once and then reused when needed.

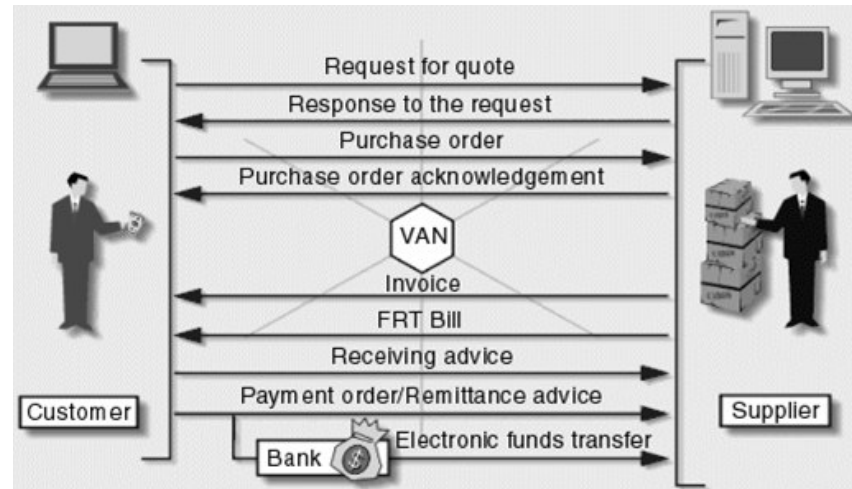


Figure 4.3 Flow of basic transaction in EDI.

1. The customer sends the supplier a request for a quotation and the product's technical specifications.
2. The supplier replies with a quotation.
3. The customer evaluates the quotation and then sends a purchase order to the supplier.
4. When the product is ready for shipment, the supplier sends the customer an invoice or advance ship notice.
5. The product is shipped. The supplier sends a freight bill to the customer.
6. When the customer receives the product, the supplier is sent a receiving advice.
7. The customer sends payment.

4.1.4 Advantages & Disadvantages of EDI

For over 30 years, EDI has given companies the prospect of eliminating paper documents, reducing costs, and improving efficiency by exchanging business information in electronic form. However it has proved to be expensive not only due to the high network infrastructure setup/running costs but also the high cost of integration. Some disadvantages are;

- EDI is costly to set up. There are initial investments in hardware and software, conversion costs of available business applications and recurring costs for the VAN or ISP. These costs limit the use of EDI to larger companies what is sometimes considered as the failure of EDI in reaching a critical mass of users.
- EDI standards are too complex trying to integrate every existing business process or document. Most EDI standards only implement a particular view on how a specific business process is organized with no recognition of any differences in those business processes.
- EDI messages are not human readable making EDI implementations harder to debug.
- EDI is too rigid to follow dynamic changes. Any change in a EDI system means changes in EDI translators and resulting in expensive implementation cycles. These changes can occur when new products or trading partners are added to the EDI system.

Corporate activities in conventional EDI are being replaced by B2B ecommerce activities based on XML. EDI was developed for proprietary, leased VAN connections, not for the Internet. Industry analysts predict that, over the next few years, EDI will grow in the billions of dollars, while XML-based B2B e-Commerce will grow into the trillions of dollars (Simon, 2001).

4.2 XML Based B2B Frameworks

B2B (integration) frameworks are generic solutions that provide mechanisms allowing information systems of organizations to communicate with each other: they standardize B2B protocol. Previously, pre-XML Electronic Data Interchange has been the most widely used of these frameworks. Following EDI, XML-based business-to-business integration frameworks have appeared, employing XML technologies and the Internet. These frameworks are also often referred to as e-Business frameworks.

In this part of this chapter some properties and categorization of the XML-based frameworks is presented, and then three such frameworks are presented as examples: xCBL, RosettaNet, and ebXML are selected as being typical representatives.

While all XML-based business-to-business integration frameworks do employ XML, many other technologies and mechanisms are also involved in addition to the markup language, and the term “XML-based” should probably be understood primarily as a category name identifying these frameworks from other types of B2B integration frameworks.

There are three basic issues an XML-based B2B integration framework (Nurmilaakso & Kotinurmi, 2004), an e-Business framework, might address:

- *Document issues*, including a vocabulary of terms that can be used in business documents and structure of such documents.
- *Process issues*, what business documents are exchanged, in which order, and what are the roles of parties in the exchange.
- *Messaging issues*, describe how messages are packaged and transferred, including issues such as reliability and security.

All e-Business frameworks address all these aspects, however, and some are more concentrated on a subset of these. There are many e-Business framework initiatives (Nurmilaakso & Kotinurmi, 2004):

- **Cross-industry frameworks**, such as cXML (commerce XML), OAGIS (Open Applications Group Integration Specification), and xCBL (XML Common Business Library) provide business vocabularies that should be usable across industries. They do not typically define messaging and process very well.
- **Industry-specific frameworks**, such as RosettaNet, and papiNet for the paper and forest industry, provide industry-specific vocabularies and process definitions, also specifying messaging.

- **Process-centric frameworks**, such as BPML (Business Process Modeling Language), ebXML (electronic business XML), and XPDL (XML Process Definition Language), focus primarily on business processes. Of these, only ebXML is clearly targeted towards addressing full business-to-business integration, specifying messaging and related issues.

4.2.1 xCBL

Common Business Library (xCBL) was started in 1997 by Commerce One, and is a pioneer framework applying XML to e-Business. xCBL is a set of XML-based components that allows the creation of XML-based business documents. A vocabulary of the most common cross-industry business documents has been developed after ASC X12 and EDIFACT. Utilizing the EDI semantics, xCBL aims at to speed and facilitate the implementation for existing systems based on EDI. xCBL also strives to preserve and extend the investments made in EDI.

Library: The library of xCBL 4.0 consists of 44 business documents in eight namespaces in addition to the core. These categories are Order Management, Preorder Management, Financial, Material Management, Message Management, Application Integration, Catalog, and Statistics and Forecasting areas. The library comprises Global Elements, which are business documents in a certain namespace. There are also verbal scenarios for exchange of these business documents. In addition, the library includes ComplexTypes, which are components consisting of elements with attributes, and SimpleTypes, which are enumerations for the elements and attributes. xCBL provides schemas for business documents in the XSDL format.

- **Core:** This contains components used several times in other namespaces.
- **Order management:** These documents are used for general order creation and processing. These include any documents exchanged between trading partners for the procurement of goods or services.
- **Preorder management:** These are used before order creation. These include documents used for confirmation or validation of price and inventory information.

- Financial: These are used for the processing of payment for invoicing the goods or services. This generally includes documents that are exchanged between a trading partner and a financial institution.
- Materials management: These are used for managing inventory. This includes documents associated with the forecasting, shipment, or receipt of goods or services.
- Message management: These are associated with generic xCBL document processing. This includes any documents that are to be used for general acknowledgement, response, and error communication.
- Application integration: These are used to interface with backend ERP systems.
- Catalog: This document is associated with catalog content creation, processing, and inquiries.
- Statistics and forecasting: These documents are used to provide statistical data and forecasting data for products over a specified time period.

xCBL focuses on business document issues although it provides business process information on the exchange of these documents in the form of verbal scenarios. Otherwise, it does not deal with business process and messaging issues.

4.2.2 RosettaNet

RosettaNet is widely recognized as the most achieved and used business framework to date. Leading companies in the electronic sector formed the RosettaNet consortium in the beginning of 1998. RosettaNet now comprises more than 400 companies (among which SAP, HP, Cisco Systems, IBM, NEC and Oracle) working to develop e-Business standards.

As opposed to ebXML, RosettaNet is more focused on the business schemas and process descriptions than on the technical infrastructure (messaging framework, centralized registry, etc.)

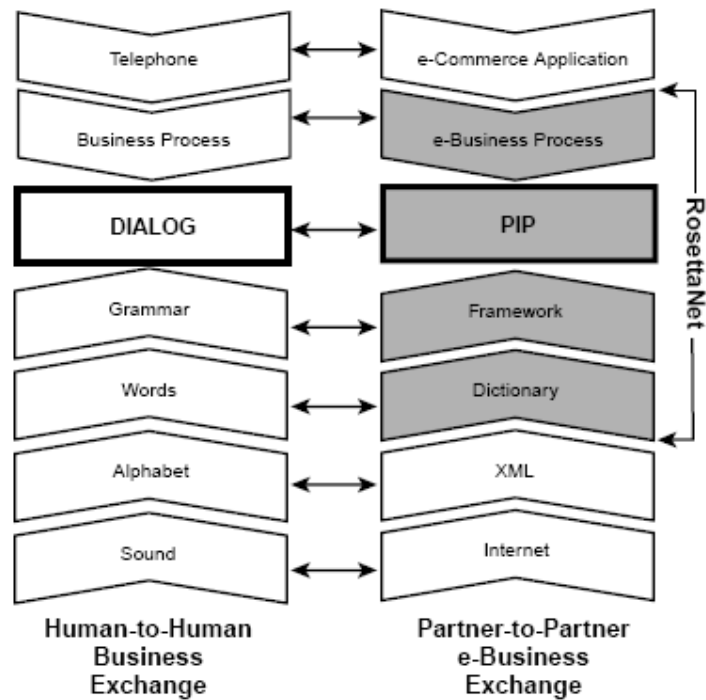


Figure 4.4 RosettaNet value proposition.

The main components of the RosettaNet e-Business architecture consist of the following:

- Data dictionaries Partner
- Interface Processes (PIPs)
- The RosettaNet Implementation Framework
- Business process modeling and analysis

4.2.2.1 Data Dictionaries

RosettaNet dictionaries provide a common vocabulary platform for conducting business within the trading network:

- **The RosettaNet Business Dictionary (RNBD)** contains information about the trading partners like Business Properties, Business Data Entities

and Fundamental Business Data Entities. There is only one business dictionary that encompasses all supply chains like Electronic Components (EC), Information Technology (IT), etc.

- **The RosettaNet Technical Dictionary (RNTD)** provides properties for describing products and services.

4.2.2.2 Partner Interface Processes (PIPs)

RosettaNet Partner Interface Processes (PIPs) define business processes between trading partners. These are pre-defined XML-based conversations. A conversation consists of a set of business documents (e.g., purchase order, purchase order acknowledgment) and message exchange logic (e.g., the sequencing of the actions that take place during a product quote request). A PIP is defined using a combination of textual and graphical (UML-based state machine) representations. PIP's are organized hierarchically in clusters and then in segments. These clusters include Administration, Partner Product and Service Review, Product Introduction, Order Management, Inventory Management, Marketing Information Management, Service and Support, and Manufacturing.

| Cluster | Segment | PIP |
|--|---|--|
| ... | | |
| 1. Partner Product and Service Review | | |
| | 1A. Partner Review | |
| | | 1A1. Request Account Setup |
| | | 1A2. Maintain Account |
| | 1B. Product and Service Review | |
| | | 1B1. Manage Product Information Subscriptions |
| 2. Product Information | | |
| | 2A. Preparation for Distribution | |
| ... | | |
| | | 2A5. Query Technical Information |
| | | 2A6. Query Product Lifecycle Information |
| ... | | |
| | 2B. Product Change Notification | ... |
| | 2C. Product Design Information | ... |
| | 2D. Collaborative Design and Engineering | ... |
| 3. Order Management | | |
| | 3A. Quote and Order Entry | |
| | | 3A1. Request Quote |
| | | 3A2. Request Price and Availability |
| ... | | |

Figure 4.5 Extract of the organization of the PIP's.

4.2.2.3 The RosettaNet Implementation Framework

The RosettaNet Implementation Framework (RNIF) provides a structure for inter-system communication, messaging, transaction control, and response mechanisms as well as the implementation guidelines for creating components that facilitate the execution of PIPs. The RNIF core specification outlines the protocols used for the reliable, secure, quick and efficient exchange of PIPs and related business process information.

The RNIF is defined through the use of PIP implementation and message guidelines. These define the vocabulary, structure, and allowable data elements as

well as values and value types for each message exchanged in a PIP. The message guidelines are composed of three major parts: the preamble header, service header, and service content. These are all packaged for transport as MIME (Multi-purpose Internet Mail Extension: Standard which allows one to transfer any type of file by electronic mail on the Internet) messages that are packed, validated, and transmitted between RosettaNet participants through server-to-server transfers or transfers through an intermediate human-controlled browser.

4.2.2.4 Business Process Modeling and Analysis

Although the dictionaries, PIPs, and RNIF form the core of the RosettaNet specification, supporting business process modeling and analysis activities surround them in a layer of additional capabilities. The business process modeling involves a number of activities around identification and quantification of the various elements of a business process and the possible reengineering of those processes to simplify their implementation. It involves the creation of an “as-is” model of current business processes and generic “to-be” processes to be modeled in the RosettaNet architecture. A “blueprint” is created from the “to-be” model that identifies all the partner roles, interactions, and interfaces required to execute a business process. This includes specifications for PIP services, transactions, and messages. A PIP protocol is then created from the blueprint that results in a valid XML document based on the data dictionaries and RNIF.

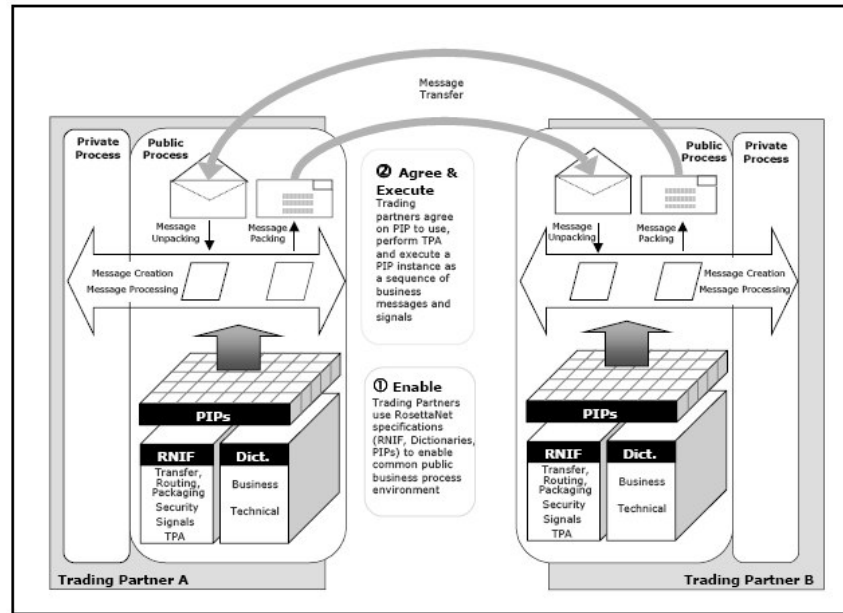


Figure 4.6 RosettaNet specifications in a trading partner implementation.

4.2.3 ebXML

“ebXML” stands for “electronic business XML”, and is meant to become a global standard for electronic business. Its goal is to enable anyone, anywhere to do business with anyone else over the Internet, which is expressed by its mission statement : “Creating a single global electronic market”

EbXML was created in 1999 as a joint partnership by UN/CEFACT and OASIS in order to replace or augment existing EDI standards. The group saw the main challenge as being able to deliver the same value large organizations realized in the EDI specification to small- and medium-sized enterprises (SME). In other words, the vision of ebXML is to create a single set of internationally agreed upon technical specification that consists of common XML semantics and related document structures to facilitate global trade.

ebXML needs to identify trading partners and messages and account for all message traffic. ebXML also identifies common data objects, called core components, that allow companies to interchange standard EDI data with XML

vocabularies compliant with the ebXML specifications. XML enables more open, more flexible transactions and innovative "e-Marketplace" business models than EDI.

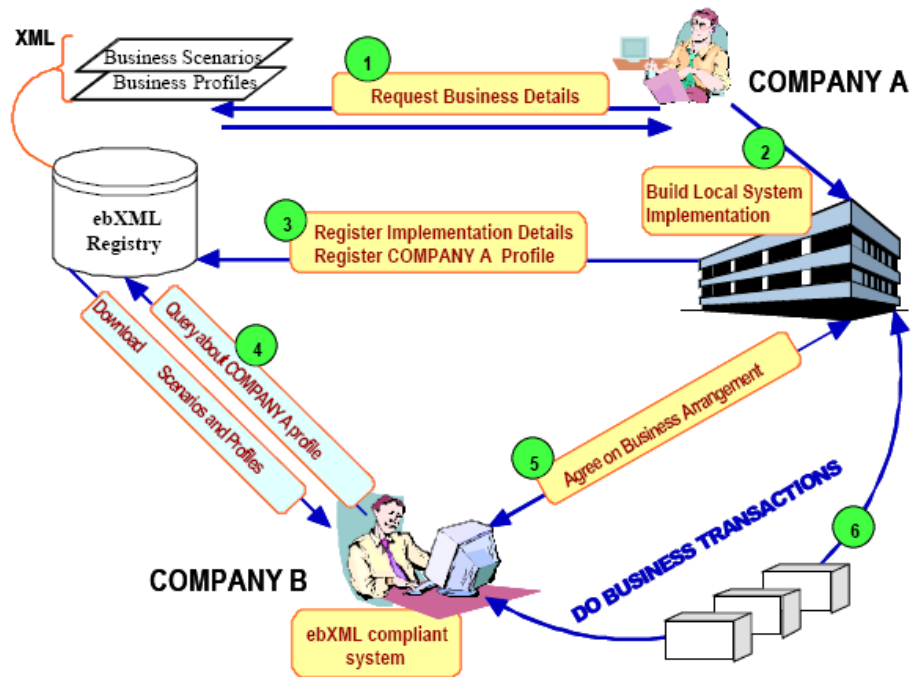


Figure 4.7 A high level overview of the interaction of two companies conducting e-Business using ebXML.

In Figure 4.7, Company A has become aware of an ebXML Registry that is accessible on the Internet (Figure 4.7, step 1). Company A, after reviewing the contents of the ebXML Registry, decides to build and deploy its own ebXML compliant application (Figure 4.7, step 2). Custom software development is not a necessary prerequisite for ebXML participation. ebXML compliant applications and components may also be commercially available as shrink-wrapped solutions.

Company A then submits its own Business Profile information (including implementation details and reference links) to the ebXML Registry (Figure 4.7, step 3). The business profile submitted to the ebXML Registry describes the company's ebXML capabilities and constraints, as well as its supported business scenarios. These business scenarios are XML versions of the Business Processes and associated

information bundles (e.g. a sales tax calculation) in which the company is able to engage. After receiving verification that the format and usage of a business scenario is correct, an acknowledgment is sent to Company A (Figure 4.7, step 3).

Company B discovers the business scenarios supported by Company A in the ebXML Registry (Figure 4.7, step 4). Company B sends a request to Company A stating that they would like to engage in a business scenario using ebXML (Figure 4.7, step 5). Company B acquires an ebXML compliant shrink-wrapped application.

Before engaging in the scenario Company B submits a proposed business arrangement directly to Company A's ebXML compliant software Interface. The proposed business arrangement outlines the mutually agreed upon business scenarios and specific agreements. The business arrangement also contains information pertaining to the messaging requirements for transactions to take place, contingency plans, and security related requirements (Figure 4.7, step 5). Company A then accepts the business agreement. Company A and B are now ready to engage in eBusiness using ebXML (Figure 4.7, step 6).

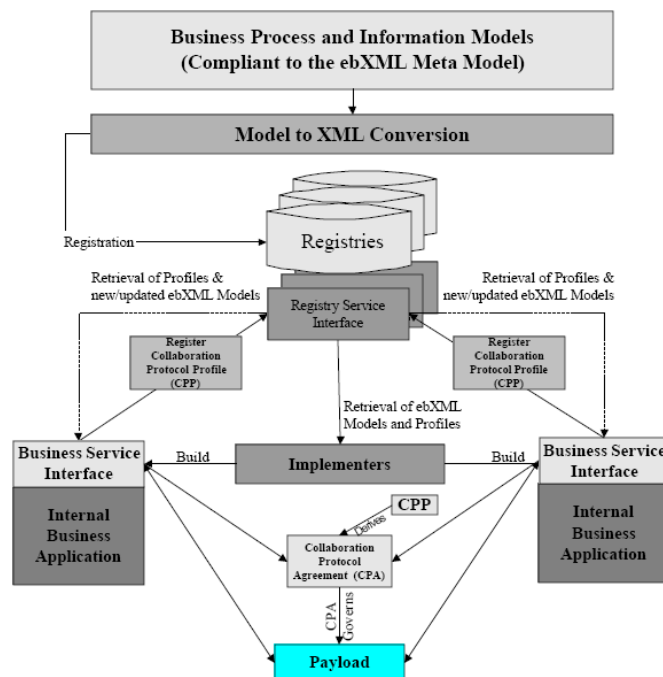


Figure 4.8 An overview of functional components in ebXML.

The ebXML architecture provides the following functional components (Figure 4.8):

Registry/Repository: A registry is a mechanism where business documents and relevant metadata can be registered such that a pointer to their location and their metadata can be retrieved as a result of a query. A registry can be established by an industry group or standards organization. A repository is a location (or a set of distributed locations) where a document pointed at by the registry resides and can be retrieved by conventional means (e.g., http or ftp).

Collaboration-Protocol Profile and Agreement (CPP & CPA): The Collaboration Protocol Profile (CPP) provides both DTD and XML Schema definitions of an XML document that specifies the details of how an organization is able to conduct business electronically. It specifies such items as how to locate contact and other information about the organization, the types of network and file transport protocols it uses, network addresses, security implementations, and how it does business (a reference to a Business Process Specification). The Collaboration Protocol Agreement (CPA) specifies the details of how two organizations have agreed to conduct business electronically. It is formed by combining the CPPs of the two organizations.

Business Process Specification Schema (BPSS): The Specification Schema provides the definition of an XML document (in the form of an XML DTD) that describes how an organization conducts its business. While the CPA/CPP deals with the technical aspects of how to conduct business electronically, the Specification Schema deals with the actual business process.

Messaging Service (ebMS): ebXML messaging service provides a standard way to exchange messages between organizations reliably and securely. It does not dictate any particular file transport mechanism, such as [SMTP], HTTP, or FTP.

Core Components: ebXML provides a core component architecture where a core component is a general building block that basically can be used to form business documents.

Participation in ebXML is very high at the moment and consists of almost every large software vendor and XML-consuming organization currently in the market. Many associations, government standards bodies, and other groups are also members or otherwise affiliated with ebXML. Backers include a large number of high-tech, manufacturing, logistics, finance, and other companies of many different industries. Many standards groups are also working with ebXML, including the National Institute of Standards and Technology (NIST), W3C, and RosettaNet.

CHAPTER FIVE

TURKOGLU E-PAZARYERI

5.1 Application Architecture

Turkoglu E- Pazaryeri web application is designed and built across three logical tiers (Figure 5.1):

- Presentation Layer
- Business Logic Layer (BLL)
- Database Access Layer (DAL)

Presentation Layer: Refers to the web application pages. This layer consists of standard ASP.NET web forms and works with the output of the business logic layer and transforms the results into something usable and readable by the end user.

Business Logic Layer: Refers to the component that encapsulates all the business logic of the application. The business layer functions between the presentation layer and data access layers, sending the client's data requests to the database layer through the data access layer.

Database Access Layer: Provides access to the database by executing a set of SQL statements or stored procedures.

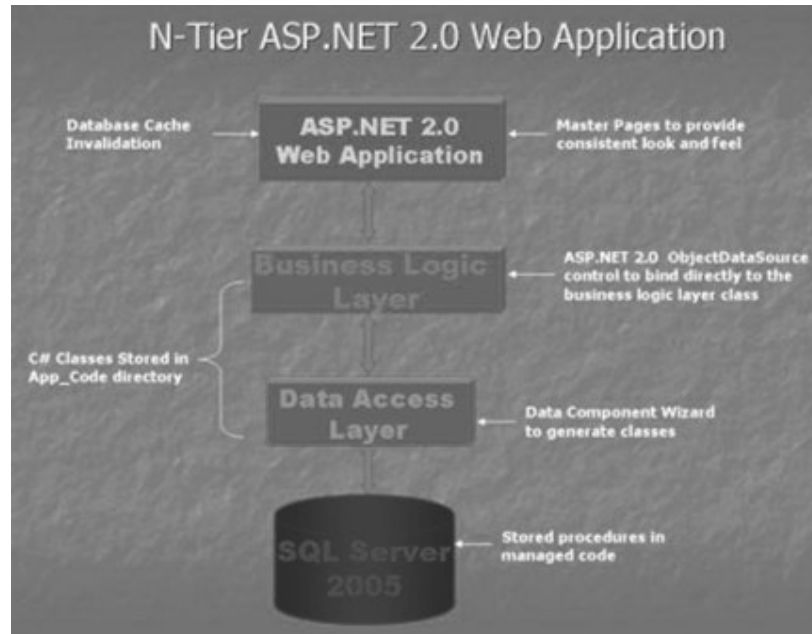


Figure 5.1 N-Tier asp.net 2.0 web application

5.2 The Structure of Turkoglu E-Pazaryeri

Multilayered structure applied on the Turkoglu E-Pazaryeri project is shown at the Figure 5.2.

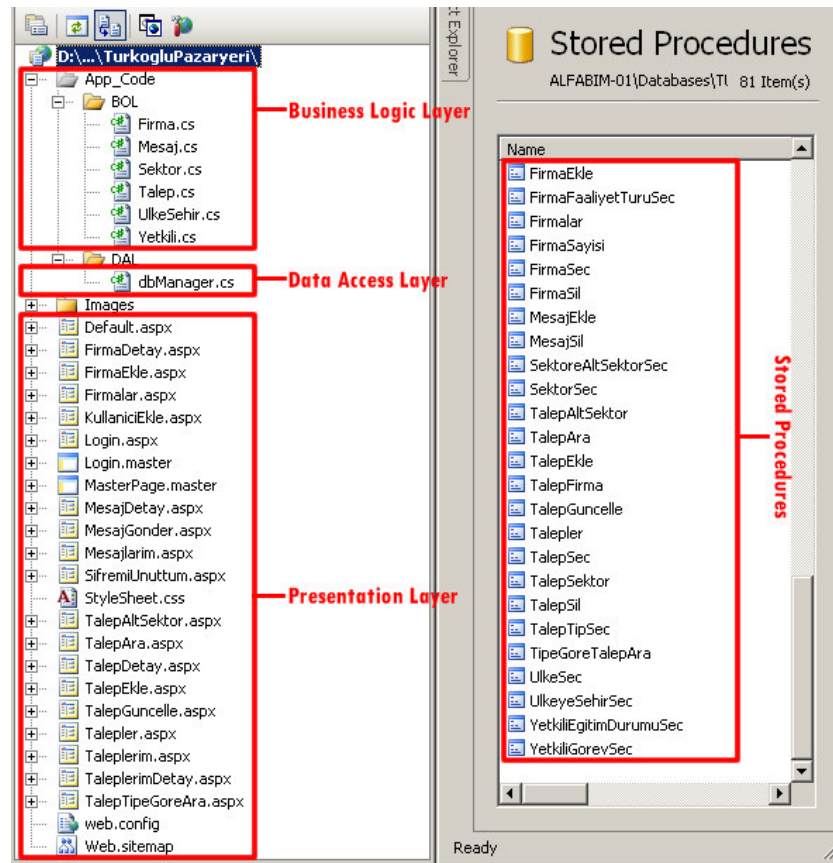


Figure 5.2 Structure of Turkoglu E-Pazaryeri.

At the business layer part of the project 7 classes were used. These classes can be analyzed under two categories. dbManager class stated at DAL forms first category and the second category contains other classes under BLL.

- dbManager class:** It is the class that is used to reach the database. Any class operating with database is required to be using this class. For instance, the code which lists the firms is among this class (Figure 5.3). All methods and properties listed in Figure 5.4.

```
public static DataSet Firmalar() {
    dbManager dbFirma = new dbManager();
    return dbFirma.ExecuteDataSet("Firmalar");
}
```

Figure 5.3 The code listing the registered firms on the system.

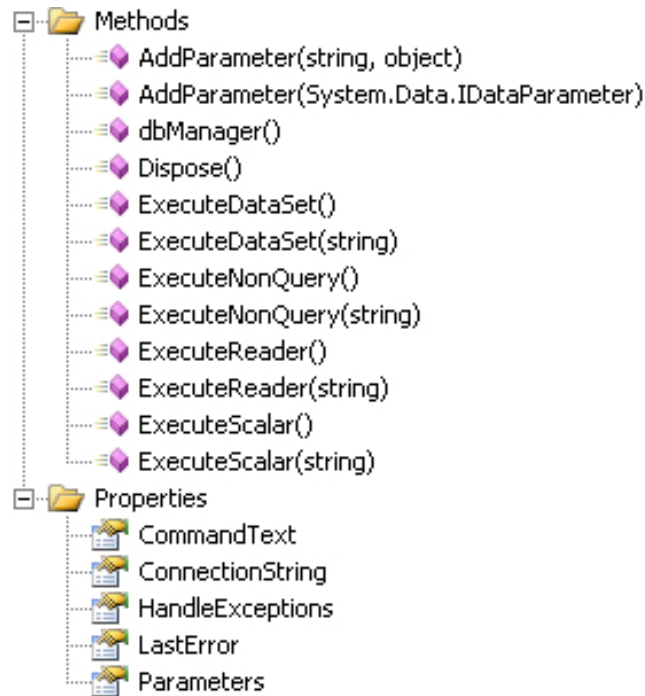


Figure 5.4 The method and the properties of the dbManager class.

- **Firma, Mesaj, Sektör, Talep, UlkeSehir, Yetkili classes:** The required classes which enables the process of the project. The properties and methods of these classes are explained in the Figure 5.5 in detail.

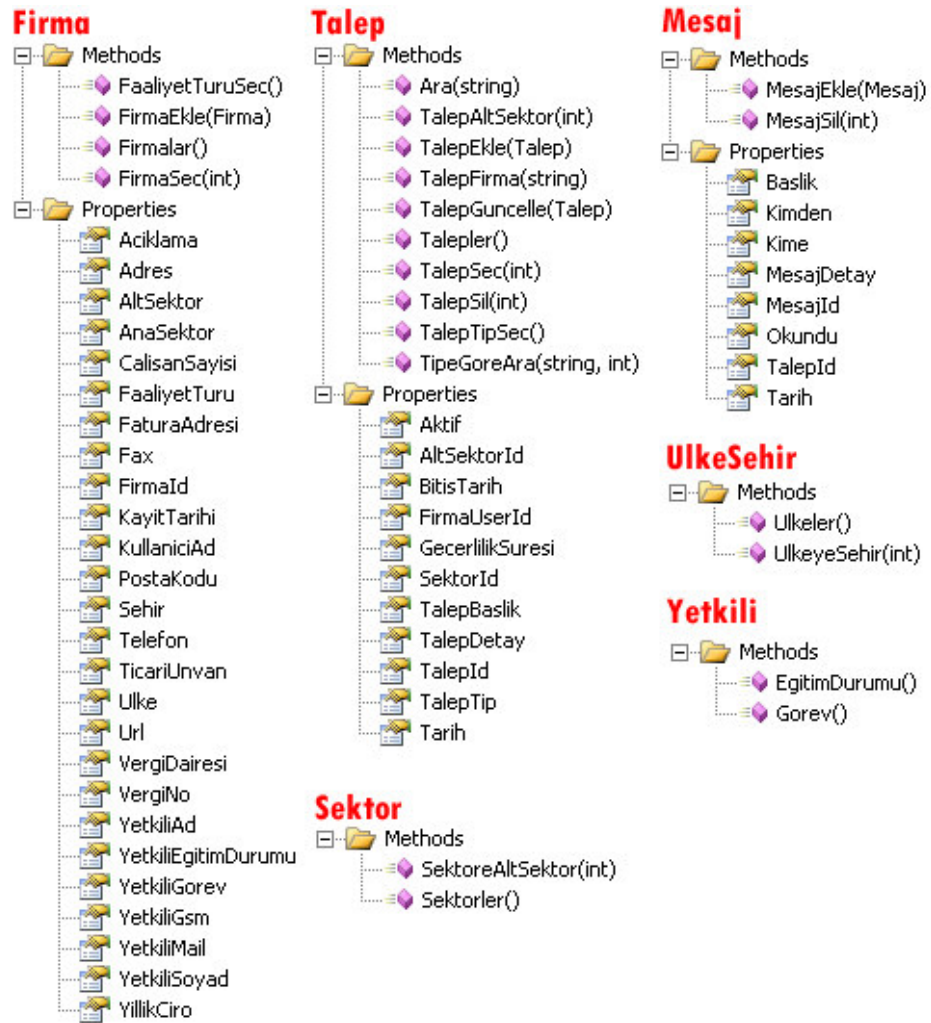


Figure 5.5 The details of the classes at the BLL layer.

5.3 Database structure of Turkoglu E-Pazaryeri

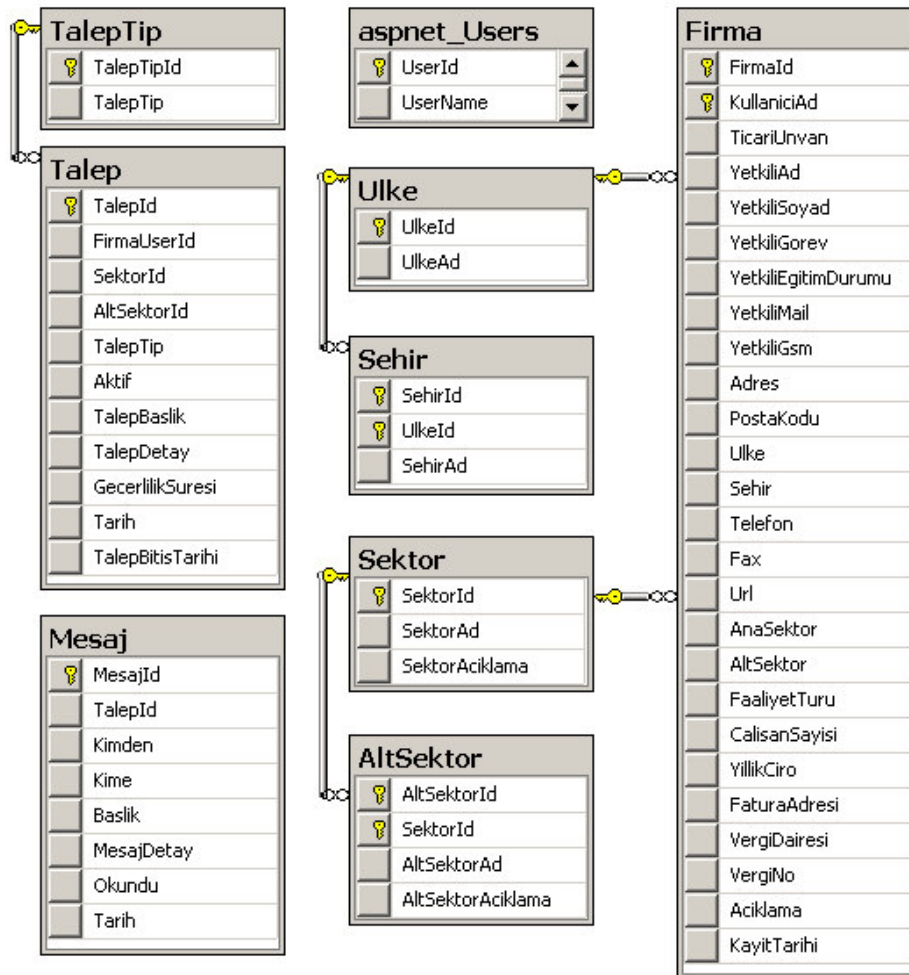


Figure 5.6 The physical database schema of Turkoglu E-Pazaryeri.

Turkoglu E-Pazaryeri contains 9 pieces of tables in its structure. If we analyzed the database we will face to:

- Table named as “Firma”, is the place where all the information is stored. “Sektor”, “Altsektor” , “Ulke” and “Sehir” tables are used to provide practical and easy storing.
- Table “Talep” is the place where all the selling or buying demands of registered firms are stored. Crucial information such as the owner of the demand, title and details of it and expiration date are recorded in this table.

- Table “Mesaj” stores the contact information of the owner firm of an interested demand.

Turkoglu E-Pazaryeri uses stored procedures to encapsulate all of the database queries. The use of stored procedures provides a clean separation between the database and the middle-tier data access layer.

5.4 General Overview of Turkoglu E-Pazaryeri

All buyers and sellers come together at Turkoglu E-Pazaryeri which is designed as an electronic marketplace. Member firms use user-friendly web based software to meet the other members. System is simplified by eliminating the trivial details and massive contents and it let the user to focus on their own demands and shopping. Thus demanded and supplied products can be easily traded.

5.4.1 Registration

User registration is required to make use of Turkoglu E-Pazaryeri. Login screen firstly seen to enter the system.

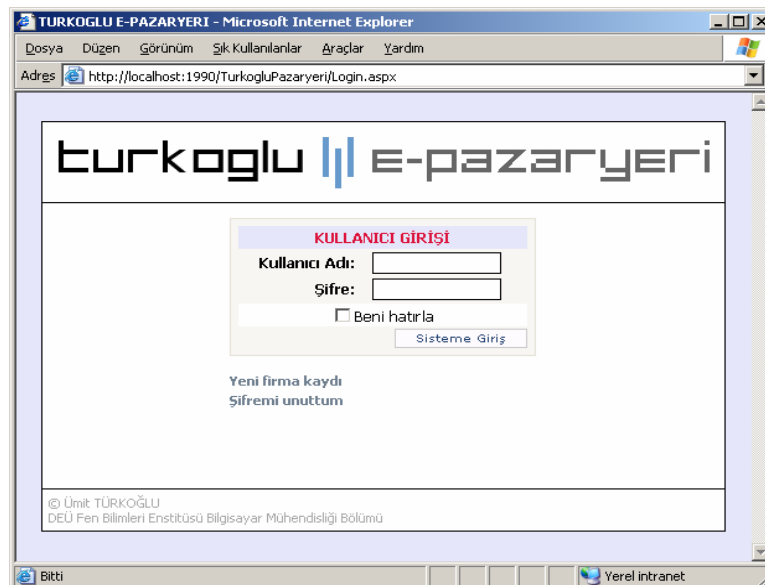


Figure 5.7 Turkoglu E-Pazaryeri login screenshot.

Registered users can log in the system with their username and password. Anonymous users are directed to the sign-up page for new users' registration by a link which is placed at login page. Sign-up procedure takes two steps. In the first step (Figure 5.8), anonymous users are asked to define a username, password, an e-mail address and a security question which is asked in case of forgetting the username or password.

Figure 5.8 First step of Turkoglu E-Pazaryeri registration form sample.

At the second step, business title, contact details and sectoral information details are asked for the registering firms (Figure 5.9). The complete information is significantly required to ensure qualified and detailed profile for the firms which are shared during shopping later on. Incomplete registration is warned with the error message below (Figure 5.10).

Figure 5.9 Detailed information page about the firms.

Figure 5.10 Error messages during registration.

After the completion of registration, users are directed to main page of Turkoglu E-Pazaryeri. User can behave as BUYER or SELLER. User-friendly main page contains all operations under its structure (Figure 5.11). List of operations can be found below:

1. **Menu:** Buyer's transactions, seller's transactions and general links.
2. **Demand Searching:** Search engine part which seeks among all selling and buying requiring.
3. **Business Directory:** Directory tree that lists sectoral and subsectoral categories with their links.

4. **Specific Operations:** Editing/deleting messages and organizing activities part for the related firm.
5. **Statistics:** Statistical part which informs about the number of registered firms and demands.

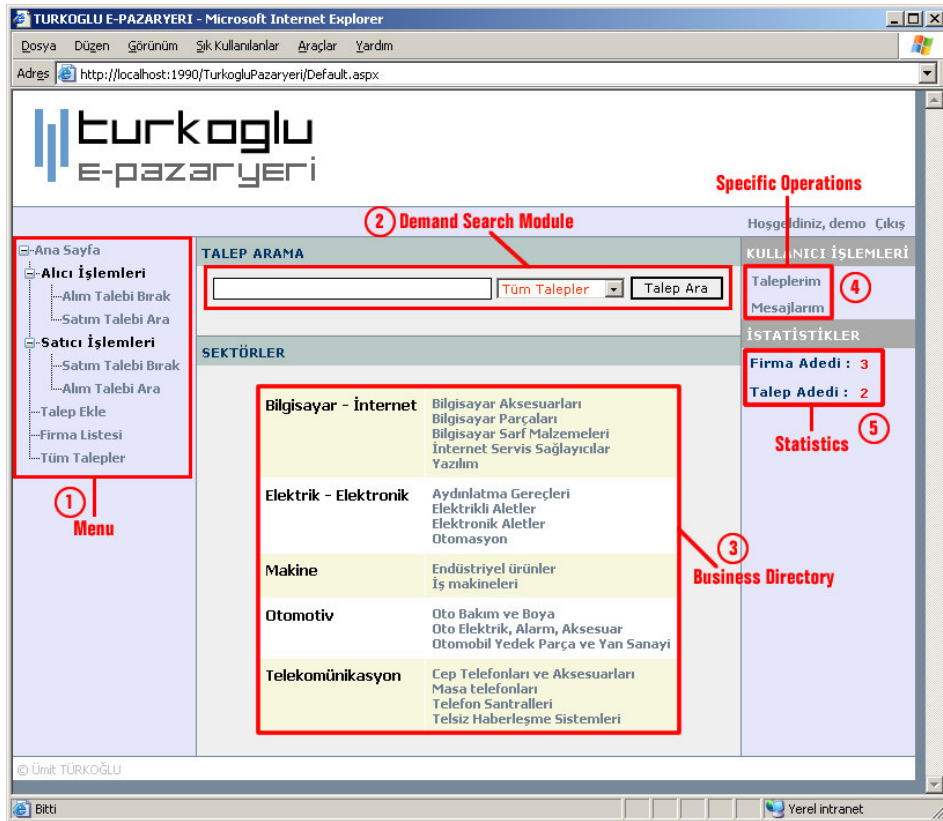


Figure 5.11 General view of the Turkoglu E-Pazaryeri.

5.4.2 Demand Operations

Registered user can post buying or selling demand, search among existing demands and send message to opposing firms which announce the demand. At the demand posting form, firms are asked to give detailed information about the type, sector, sub-sector, title and explanation of the demand. As well as expiry date is significantly required for each demand. Any demand is taken out from the system database when the expiration occurs.

Figure 5.12 Demand posting form.

Posted demand can be seen by other firms after it is added to system database. Firms can reach and list their own posted demands from the “Taleplerim” link placed under specific operations directory.

| TALEP TİPİ | TALEP BAŞLIĞI | BİTİŞ TARİHİ |
|------------|-----------------------------------|--------------|
| SATIM | Satılık IQ-Call bayiliği | 02.10.2006 |
| ALIM | Bilgisayar parçaları alınacaktır. | 17.10.2006 |

Figure 5.13 The demand page of a firm.

A firm can click on an interested link to reach the detailed further information about the demand. At the new page update and delete selections will be stated as links.

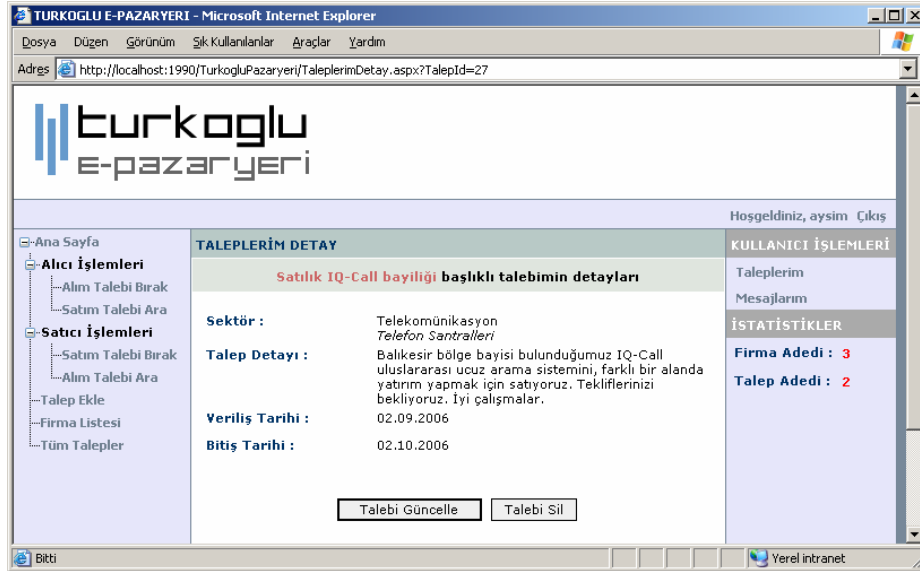


Figure 5.14 Demand details, demand update and delete demand links.

Demand update can be done via shown figure below (Figure 5.15).

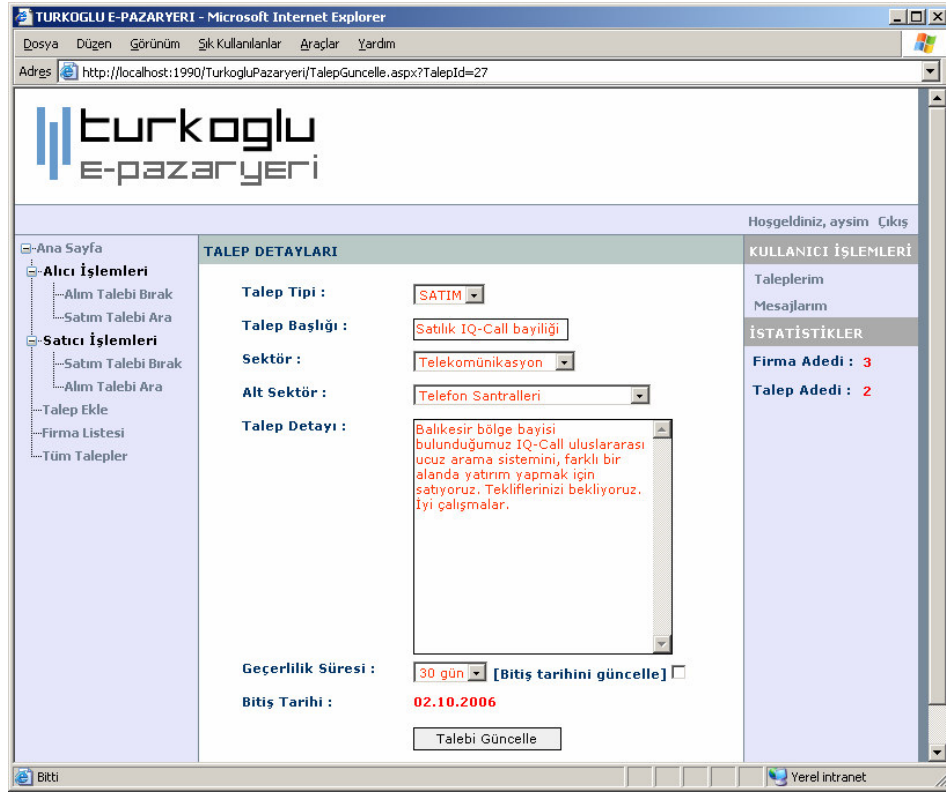


Figure 5.15 The update of related demand.

Demand can be deleted after the last confirmation is approved as shown in figure below (Figure 5.16).

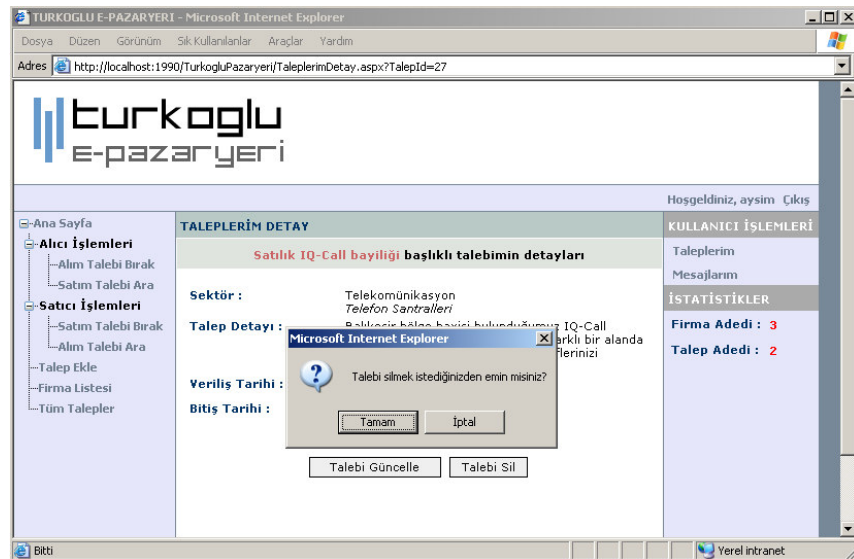


Figure 5.16 Purguing of a demand.

Registration of a firm, posting demand to system, updating existing demand and deleting of demand is examined at the preceding part. From now on, replies sent to posted demands and evaluating the replies done by the demand owner firms will be investigated.

5.4.3 Evaluating Demands and Messaging

Any shopping firm can list the demands either via searching demand or listing them. As well as, links placed at main page under Business Directory can be used for demand listing. In the next figure, a demand screening sample is simulated. In addition to demand details, short profile of the firm can be viewed. Another link in the page leads to further details about the firm.

The screenshot displays the 'TURKOGLU E-PAZARYERI' website in Microsoft Internet Explorer. The browser address bar shows 'http://localhost:1990/TurkogluPazaryeri/TalepDetay.aspx?TalepId=28'. The page features the 'turkoglu E-pazaryeri' logo and a navigation menu on the left with options like 'Alım Talebi Bırak', 'Satım Talebi Ara', and 'Firma Listesi'. The main content area is titled 'TALEP DETAYI' and contains the following information:

Bilgisayar parçaları alınacaktır. başlıklı talebin detayları

Sektör : Bilgisayar - İnternet
Bilgisayar Parçaları

Talep Detayı : 10 Adet Intel P4 - 3.0 işlemci, 20 Adet Seagate 160 gb. HDD, 15 Adet 17" Phillips LCD monitör. Tekliflerinizi bekliyoruz.

Veriliş Tarihi : 02.09.2006

Bitiş Tarihi : 17.10.2006

Firma Künyesi :

Ticari Ünvan : Ay-Sim San. Tic. Ltd. Şti.

Yetkili Kişi : SerhatKILIÇ

Telefon : 02162342344

Adres : Eskiüyumcular Mh. No:10 İstanbul Türkiye

E-Posta : aysim@ay-sim.com

Web Adresi : www.ay-sim.com

Below the company information, there is a button labeled 'Firmaya Mesaj Gönder' and a 'Geri' link. The right sidebar contains 'KULLANICI İŞLEMLERİ' (Taleplerim, Mesajlarım) and 'İSTATİSTİKLER' (Firma Adedi : 3, Talep Adedi : 2). The top right corner has 'Hoşgeldiniz, umit Çıkış'.

Figure 5.17 Details of a demand.

Interested buyer firm can send message to the selling firm with the link placed at this page figured below. Through this message form buyer and seller can contact.



Figure 5.18 Screenshot from messaging page.

Right after the message form completely filled and sent by buyer firm, seller firm can reach this message under the “Mesajlarım” part that is highlighted under Operations part and figured below (Figure 5.19).

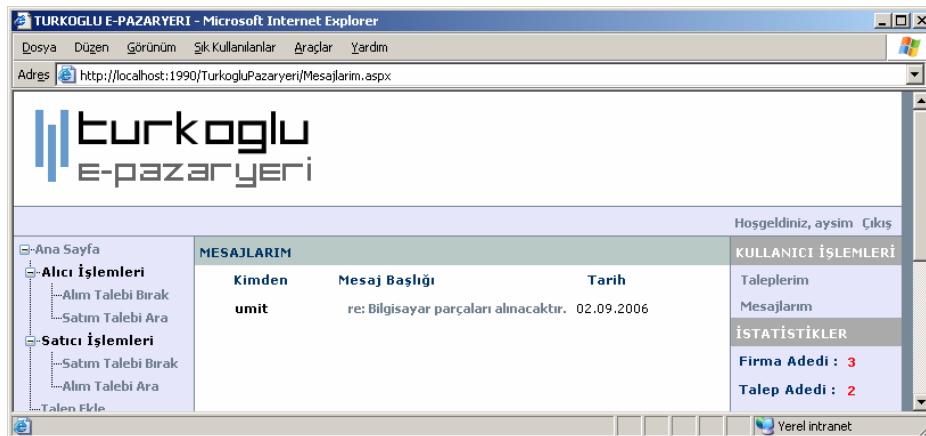


Figure 5.19 Screenshot of firm's messages.

Demanding firm should either reply to messages or delete them (Figure 5.20).

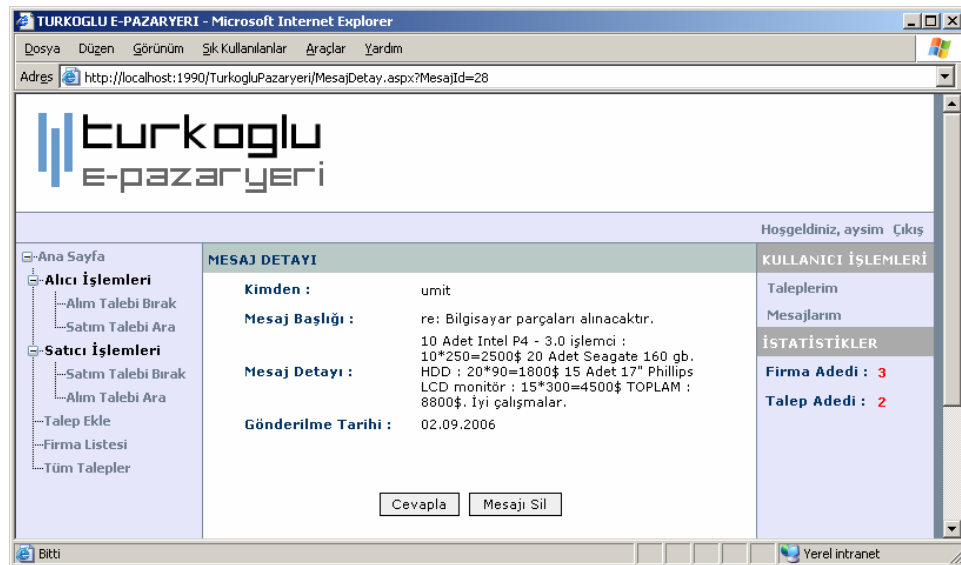


Figure 5.20 Details of messaging part.

The Turkoglu E-Pazaryeri system's structure is examined generally. Main page contents are revealed structurally with sample figure screenshots.

CHAPTER SIX

CONCLUSION

In conclusion, traditional business concept is blended with developing technologies and new generation of business understanding based on electronic environment is analyzed. Smooth transition from business to e-Business in favor of the participant firms and their profit maximizing aims is criticized. Advantageous renovations brought with e-Business environment are listed and comparison with traditional system done.

Throughout defining electronic business concept, its importance and advantages are better understood. The necessities of wider applications are perceived which came up with a theory of business to business and business to customer electronic businesses. Also, complete brunches of e-Business tree are examined during my thesis.

Moreover, the e-Marketplaces which are crucial keys for the developing and wide spreading of B2B e-Business is specifically explained and exemplified with a simulated program, Turkoglu E-Pazaryeri. Increase of the popularity of internet usage allows e-Marketplaces to become popular and more widely used. Also, XML based B2B applications overcomes handicaps of existing EDI system, such as rigid standards and high costs. Overall, better contact among firms gained which ends up greater data interchange and volume of business.

Specifically, B2B e-Marketplace is simulated with a generated program Turkoglu E- Pazaryeri. User-friendly interface and multifunctional modules at the structure made the e-Business more practical and enabled significant easiness for the registered users. Throughout my thesis, Turkoglu E-Pazaryeri structure and its functioning is analyzed in detail with useful screenshot figures and explanations.

Lastly, it can be stated that recent transfer of business to electronic environment as e-Business is studied which end up less expensive and more practical trade life for

the business sector. Testing and confirmation of whole statements in my thesis implemented with Turkoglu E-Pazaryeri.

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