M.Sc. COMPUTER SCIENCE

Dissertation

« The effect and the role of e-commerce, e-logistics: Research on South Eastern Europe companies'»

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CHAPTER 1: INTRODUCTION

1.1 PROLOGUE

Nowadays, the intense complexity and polymorph is of the most important issues that characterize companies' activities. More specifically, the companies' activities are influenced of new prospects and knowledge that enrich the way that the business dexterity takes place while new enterprising relations are created. The enterprising world, in a climate of intense uncertainty, seeks new opportunities in order to extend its activities. This happens for two reasons: First is the profit added and second and not least is the matter of business survival. Companies that activated to the logistics domain tend to interest of new ideas and technologies that will improve their business dexterity. New prospects that start to penetrate to the companies' existence are the e- commerce logistics based on the logistics criteria and principals.[45[

More than ever, the significance of globalisation and the essential transformation of the planet under the use of automated systems become more perceptible. The enterprises take this idea into consideration and try to initiate business in a wider geographic space seeking investment opportunities in the entire world. But this process has been proven particularly difficult. They soon understand that, the acquisition of specialised knowledge and the "know-how" for the achievement of this objective was necessary.

The use of logistics comes in a direct correlation with the sector of transports goods from the production locations to the final destinations. This transportation must be the right time, in the right part, in the desirable quantity and quality and in an acceptable price. This indicates that, the business must facilitate all the processes of trade in the best possible way making the transport of merchandises and other services in the entire world feasible. This need has been detected by a great number of companies. It becomes obvious that the adoption of e-logistics principals help companies to provide better its services and goals.

It must be noticed that the consequence of logistics appeared to be the e-logistics and also the e-commerce logistics. E-logistics is an outcome of the development of Internet. It provides logistic business activities based on a virtual environment and services that are combined with the Internet technology. This is the main research area of our thesis. Initially, we will analytically present the significance of e-logistics and its various aspects within the limits of the most extended term of "supply chain management". We will document the e-commerce logistics based on the logistic criteria and principals and how it can be exploited to the companies' development and survival.

We must mention that the domain of our interest of the use of e-logistics will concentrate on the countries of South-eastern Europe. We will extensive an analysis of how companies are activated to these countries. In these countries, logistics activities take place but the electronic market is still under development. The adoption of a global logistics system is under consideration and the use of it will effect great changes for the most companies. Most of these companies focus on issues such as the infrastructure of transports and products. E-logistics will improve the particular transports sectors and the way that companies control their products.

The importance of these countries to promote safer, faster and easier their services lead us to propose a full functional e-commerce site that works using an on-line manager administration and e-logistics criteria. It must be noticed that we propose a well organised fragmented database that can be used under the philosophy of company's operation.

1.2   MOTIVATION

E-logistics is a result of the development of the Internet technologies and the changes that occur to the domain of logistics. Companies are starting to adopt the e-logistics. E-logistics is developed all over the world and this is the reason that makes it interesting study and research.

South Eastern Europe countries are an innovative market in the domain of e-logistics. The main reason of this choice is because the economy of these countries starts now to grow up and to adopt new ideas, technologies and techniques. Companies in the Southern Eastern Europe are of great interest because e-logistics for them is a new phenomenon. In these countries there are a great number of companies that offers a significant work in the domain of transportation and production. It will lead us to see how the e-logistics can be developed and become efficient to these companies.

It is necessary to analyze definitions and issues that are close related to e-logistics in order to take the appropriate knowledge. The fundamental aim of the research thesis is to analyze the area of e-logistics, its components and all the participants that complete the supply chain.

The need of companies to exploit the way that handles their orders, products and general their services lead us to interest of creating an e-commerce site based on the logistic issues. It can be used of the companies for providing faster their operations and improve their communication. The creation of e-commerce logistic site is changeable due to its company needs and demands.

1.3   AIMS AND OBJECTIVE

The main issue to this dissertation is to analyze and make a research to the area of e-logistics, its components and all its participants. The dissertation will be concentrate to the analysis of the

logistics that activated to the South Eastern Europe. Gathering information (general and specific) about the logistical processes of various companies from all the Southern Eastern Europe countries gives us the ability to:

- Identify problems that exist in the traditional logistical processes that are applied in these countries.

- Specify the necessary characteristics that any modernization of these logistical processes must include.

- Identify the sufficient parameters that must exist when these companies move to an e-logistics system

- Propose common back-end database schemas which when exist make the business-to-business (B2B) process easier

For the above reasons, it is important to analyze separately every part of the logistics in order to understand the whole supply chain. The procedures and operations that participate in e-logistics must be explained and analysed. The structure of an e-logistical-system that refers to processes, aspects, tools and concepts will be studied. It is necessary also to focus to the Southern Eastern Europe countries in order to represent how companies are activated to logistics in order to understand the importance of e-logistics development into these countries. The European directive forces this transition in order for these countries to comprise with the e-logistical international standards.

We show in a later section of this manuscript that the integration of various database schemas is apparent for the e-logistical unification process. For that reason we propose a set of typical database schemas according to different logistical aspects and processes such as consumer to business interface, tracking mechanisms etc. We believe that our proposition is not complete but we also believe that it also has the scalability property of aggregating other tables. The overall schema is split in sub-schemas. This makes our analysis easier and also allows for distributed and concurrent implementation of those from multiple servers. This tactic is significant since through a common web interface the business manager can get information for multiple logistical processes concurrently.

Our objective is to implement an e-commerce site that illustrates the way that the e-logistics work and combine its main components in order the company executive to have full information and initiate reports of the main components. Due to the significant amount of programming work that is involved, we only implemented a compact version of such a site using a single database by just combining the proposed schemas and cutting parts of less significant value. This e-commerce logistics site contains a database and functions that can be used of companies that use logistics for providing safer and faster their service purposes.

CHAPTER 2: THEORETICAL BACKGROUND AND LITERATURE OF REVIEW

2.1 LOGISTICS – RELATED TOPICS

In the frames of more general spread of Logistics sector, it is judged advisable to be mentioned certain definitions - explanations that will contribute in the comprehension of logistics principals that are used of the companies. Accordingly to the most significant world organisation - Council of Supply Chain Management Professionals (CSCMP)[16]. - to the sector Logistics :

Logistics are the process of planning, application and control of efficient and effective from opinion of cost, flow and storage of raw material, intermediary reserves, final products and relative information, from the point of origin in the point of consumption in order to be conformed with the requirements of customers.

The existence of logistics is oriented to the offer of right goods and services in the right time, in the right place and in the suitable situation in order the enterprises that use them to enjoy the biggest possible profit. Analysis of the logistics is necessary in order the enterprises to find ways to take advantage of the development of e-logistics.

Another definition of logistic is given by the SOLE the international Society of logistics [44] :

Logistics is the art and the science of management, engineering and of technical activities that are related to the requirements, the design, the acquisition, disposal and maintenance of means and resources in order to support the objects, the work, the drawings and the enterprises.

This definition makes clear to understand that the logistics do not only concern the functional part of an enterprise - organism but also the strategic part in order to find the way to extend the logistics to e-logistics. It happens because the logistics constitute one of the most fundamental survival factors of enterprises.

J.Johnson, S.Wood, D.Wardlow and P.Murphy [10] give their definition of logistics that shows a new perspective view. Logistics are described as the process of material and final product locomotion to the interior, in the interior and with direction the exterior environment of enterprise.

As far as concern the last definitions is needed an explanation of certain terms such as the inbound logistics and outbound logistics.

Inbound Logistics cover the movement of materials and products that are received by suppliers. It refers to the activities that are related to reception, storage and distribution of raw material

and of packing materials of products such as the market and management of materials, the storage, the control of reserves, the planning of movement and the returns in the suppliers.[13]

Outbound Logistics are reported in activities that are related with the collection, storage and the natural distribution of product in the purchasers, such as are the storage of ready products, the management of materials, the way of distribution vehicles and the management and planning of sales. [13]

SCM- Supply Chain Management

It is necessary to explain issues that is related and cooperated with logistics. Supply chain management is an issue that is more general and more extended than that of logistics. A definition of supply chain management (SCM) that is given is [16]:

Supply chain management includes all the efforts that are included in the production and delivery of final product, from the first supplier in the order up to the final consumer. The basic activities of supply chain management are four: the planning, the stocking of materials, the production and delivery. These activities determine the following efforts: management of offer and demand of raw material, production and assembly, storage and management of reserves, creation and management of orders, distribution and delivery in the customer.

The conclusion that occurs of all them is the fact that the supply chain management connects all the parts of the chain by using a process in which the attribution of its part is of vital importance for the success of entire chain. Therefore the objective goal is the biggest possible collaboration between the members to a more general interest that can be succeed through e-logistics.

Finally, it is necessary notice the differentiation between logistics and supply chain management. The logistics activities aim in the restriction of empty divergences that is created between the offer and the demand. On the other hand the administration of supply chain management is called to cover this voids decreasing the dead times and the times of preparation in the production. It happens by altering the size of orders, the capacity of production and by adding operations that offer more value in the product.

Through this prisma is shown the importance of information in the use of current systems logistics, which is also supported in the flow and exchange of information. By this way logistics can be understandable in order the companies to be open to accept new technologies and ideas that will improve their operation such as e-logistics.

LOGISTIC ACTIVITIES

A logistic system is constituted by a total number of functional activities. These activities take continuously place in an enterprise-organism and the result of them is the transformation of

raw material to final products. But we have to mention that these activities are not the same for all the enterprises due to the differences of enterprises that refers either on organisation issues or simply to the different nature of products. The only thing that is sure is the fact that the support of logistic is essential for any structure of enterprise and for any product that they produce in order to the enterprise to operate. The way that the companies handle their logistic activities will be expand by the e-logistics.

The most common logistics activities that concern the companies are [8] the customer service activity. It occupied with all the best possible promotion ways of services that interest customers in order to keep them satisfied. Another important activity is the management of orders that occupies all the procedures that are need for the handling of orders. It refers to the time period between the moment where the company accepts the order and the moment where the deposit is called to send these products to the final consumer.

The Management and control of reserves is a logistic activity of great significance. It includes the decision of the company's reserved product level in order the company to achieve the desirable level of customer service. The cost will be reduced in order to carry out all logistics processes. The storage is the process in which goods after their production and up to the moment of consumption are placed in a deposit.

The management activity of materials deals with anything that concerns the movement or flow of raw material, the planning and their management, the suitable policies of reserve, the general administration and any `natural' movement inside the deposit. Transport is the process of locomotion of goods from their point of production in the point of consumption. The operation of transportation is not limited in the offer of products on consumers but it deals to the delivery of right product, in the right place, in the right quantity and in the right time period.

Finally, an important logistic activity is the planning of product demand that includes the decision that concerns the quantity of good and the given services that the customer will require in the future. More specific, it refers to what quantity of product that produce the enterprise should be transported in concrete markets. It is also refers to which will be these regions that the demand will be presented in order the enterprise to have their product stored in them.

As it is concluded, the analysis of logistic activities has interest in order the companies to have great knowledge of what e-logistics will be support and improve.

THIRD PARTY LOGISTICS (3PL)

The definition that gives the Greek company of logistics [18] is the following:

Third party logistics is the outsourcing total or part of enterprise activities that concerns logistics. It refers to the collaboration of an institution that provides services (Third party logistics

provider) and also to a commercial or industrial enterprise (Third party logistics user).Their basic goal is the products to reach in the final customer in the small possible time and cost. In that way, they offer customer service of great importance.

As we substantially see, it is created relations that support collaboration. It is also created alliances in strategic level between companies that practise an enterprising commercial activity and companies that are activated in the space of logistics. Therefore, the question that occurs is if the companies will have the possibility to deal by themselves with the realisation of logistics work or they ask help by a company that is specialised in this. The advantages that occur from the collaboration with a 3PL company are the following [6][3]:

➢ Possibility of company focalisation in her basic activities

➢ Improved levels of service due to specialisation of 3PL companies

➢ Profit for the company due to the restriction of errors that would occur if the enterprise undertook the logistic activities by herself

➢ The enterprise would have the privilege to accept know-how to subjects even administrative due to the experience that the 3PL company will have.

REVERSE LOGISTICS

The term "Reverse logistics" is reported to the activities and practices that concern the recuperation and exploitation of used products, packing materials, elements and materials in order to the end of their use circle all these to be promoted behind to the supply chain instead of faced as useless. Substantially, "Reverse logistics" refers to a process that deals with the management of products that are returned in an enterprise by the customers that are unsatisfied from the product. The reason for that is based on various reasons. For example the product was defective, it was in different quantity than that which was asked or because it was not what they asked.

All those that are mentioned show with clarity that the goal of Reverse logistics is to develop the remaining value of reversed goods in such way in order to occur economic profit for the enterprise that adopts them.

It is also important their contribution in the position of enterprise in the general competitive environment due to the particular characteristics that accuses their use. These characteristics are the following.

The analysis and the explanation of the logistic, the logistics activities and the issues that are related to them help us to understand the way that the companies operate and how important is the development of e-logistics. It is becoming recognizable the importance of business globalization and the need for faster and flexible communication that the e-logistics framework will provide. The e-logistics are based on the logistic processes and characteristics that are used to the logistic systems.

2.2   E – LOGISTICS

E - Logistics constitute a dynamic set of communication elements, calculation, connected and interrelated communications that transmits customer character to the processes of logistics. It is realised via the division of data, knowledge and information with the collaborators that belong to the supply chain. Besides, e - logistics facilitate the timing of makes. It also helps in the right decision-making which has as final goal the distribution of right products in precise quantities, in the right place and time and in the right customers.

The development of the electronic trade and new technologies bears the significance of e – logistics. E-logistics is defined as the implementation of logistics processes by using the modern technology of information and communications. E-logistics applies the concepts of logistics electronically to aspects of business conducted via the Internet.

The activities metamorphoses that constitute the logistics via electronic means of transport, storage and data management of information is named e – logistics. It offers in the companies that will be equipped the possibility of bigger flexibility in the distribution of products that the final consumer wants as well as in support services. In that way they provide the competitive advantage to them. [12]

All these improvements and growth prospects to the enterprises would not exist without essential improvement in the sector of data treatment and information management. The increasing use of computers and suitable programs helped the logistics processes to be improved either to the speed or precision. The enterprises succeed to make possible the direct data collection, the most rapid correspondence in them and the qualitative information transport between suppliers, producers and customers. [7]

E-commerce logistics represent the myriad activities that are needed to ensure the customer gets what the customer wants when the customer wants it. They are the least glamorous but most critical functions in electronic commerce. They can also be the most expensive. E-businesses fail to recognize that often up to 40 percent of their cost of goods sold is buried in fulfilment and back-end logistics. In fact, most online merchants are unaware of what their total costs are. This lack of knowledge is directly responsible for the failure of many ecommerce businesses during the past two years.

2.3   E- COMMERCE CHALLENGES

Electronic commerce not only revolutionized the way goods are sold, but how they are delivered. The tenets of one-to-one marketing that online firms are adopting must be carried over to

their fulfilment operations, and this is creating mass-scale chaos. Customers demand customized products delivered at very high speed with complete order flexibility and convenience.

Today's online customers want to be able to track their orders instantly from the moment they click the Buy button until the moment the package arrives on their doorstep, and be able to reroute packages, determine delivery costs and time-in-transit, and break up their orders for multiple ship-to addresses. The shift of power from the seller to the buyer is creating a new era of expectations, and buyers - whether they are consumers or businesses – say they will not tolerate experiences such as partial shipments of goods on an "instalment" basis, poor product return policies, or surprise backorders. [14]

The most common form of logistics has traditionally been based on moving large shipments of items in bulk to select strategic customers in a few geographic locations. Shipments have also been tracked traditionally by container, pallet, or other unit of bulk measurement, not by individual item or parcel. Manufacturers have backed up their trucks to loading docks at retail stores or distribution facilities, relying on those entities to deliver the goods through the final links of the supply chain to the individual customer. [14]

Often the various links of the supply chain have had limited visibility into the operations of one another. The capability for end-to end visibility of a package from manufacturer to customer has been virtually non existent in a traditional logistics environment. With the advent of electronic commerce, however, traditional logistics is being radically transformed. Electronic commerce demands an agile, high-velocity, granular approach to logistics. The typical electronic commerce customer is an unknown entity who orders products on an individual basis, according to impulse, seasonal demand, price and convenience. [14]

A manufacturer or online merchant must be able to customize an individual order; ship it directly to the buyer anywhere in the world; track the whereabouts of the item at any given time along the supply chain; handle customer inquiries; handle product returns (reverse logistics); and even offer gift wrapping - all at ten times the speed and at a fraction of the cost of traditional shipping and fulfilment

2.4   E-LOGISTICS REQUIREMENTS

E-logistics in order to realise their purposes are consisted by requirements. It must be mentioned that e-logistics must be as fast as possible in order to customers have in their disposal the products when they want them. In order E-logistics to realise its scope must be flexible and enough rapid to the changes that occurs from the environment and influence its processes. So, the most important e-logistics requirements are the speed and individualized treatment.

One issue that disturbs the e-logistics procedure is the situations out of control of the logistics service providers that can influence planned operations such as traffic density fluctuations; accidents; strikes. Another issue is the rapid changes to the demand of products make difficult the availability of them. This kind of issue can lead to destination product problem on right time or places, cancel orders. [9]

E-Logistics is necessary to be fully customer controlled. It means that the e-logistics procedure must have good communication in the processing of goods to customers. The customers have great demands for products and their way to obtain them. These issues must be in the position to solve the e-logistics for the enterprises in order to be capable to serve the demandable customers. [9]

It must be mentioned the fact that the e-logistics must provide agility. The reason for that is the need to succeed to cope with the rapid and non expectable changes that happen to the enterprise environment in order to make the enterprises capable to serve the customers and generally the market. E-logistics must also provide agility in order to succeed to combine all the main components of an enterprise.

2.5   E-LOGISTICS SYSTEM

Enterprises use systems in order to control and handle their main components. These systems are called e-logistics systems. The application that they provide is combined with the handling of data, software and hardware in order to succeed to operate the enterprise activities.

The operation of e-logistic systems is based on the Transport Management System using only Internet Protocol (IP) based technology. An E-logistics system provides a multi based activity. It happens because it supports a real time visibility of the whole enterprise network through the transport and all the activities that are necessary for the completion of the enterprise work. The enterprise activities are the planning, transport operations, forecast and management. [10]

It must be noticed that the e-logistics system can control and handling all the operations that the enterprise must do for succeeding the completion of enterprise activities. It happens to the e-logistics system on contrast to other systems that exists and support parts of the enterprise activities.

It is necessary to mention that the e-logistic system is consisted from processes, information system and value. These points will be analysed in order to have a full icon for the parts that cope to the e-logistic systems.

2.5.1 E-LOGISTICS PROCESSES

E-logistics processes are based on the way that the products can be lead to the finals consumers as fast as is possible. E-logistics are occupied with the processes that compose the entire supply chain. It means that logistics start the time that the materials enter to the industry through the time that the product concludes to the final consumer.

All the automating logistics processes materialized through the mechanism of E-logistics. It provides an integrated, end-to-end fulfilment and supply chain management services to the players of logistics processes.

E-logistics processes are included from three web services. First of all the Request For Quotes (RFQ), Shipping, and Tracking.

According to Zang [12] *"The business process manager invokes the RFQ process to get the basic services such as getting the quotes in an e-logistics process. Whenever the response is obtained, the purchase order (PO) is updated. Shipping process is also invoked by the business process manager and upon completion updates the PO. Once goods are shipped, the tracking number is given to the customer and that tracking number is mapped to the PO number in an e-commerce system. Customers can track their shipment with the help of that number."* The interaction diagram of e-logistics and business process manager is shown in Figure 1.
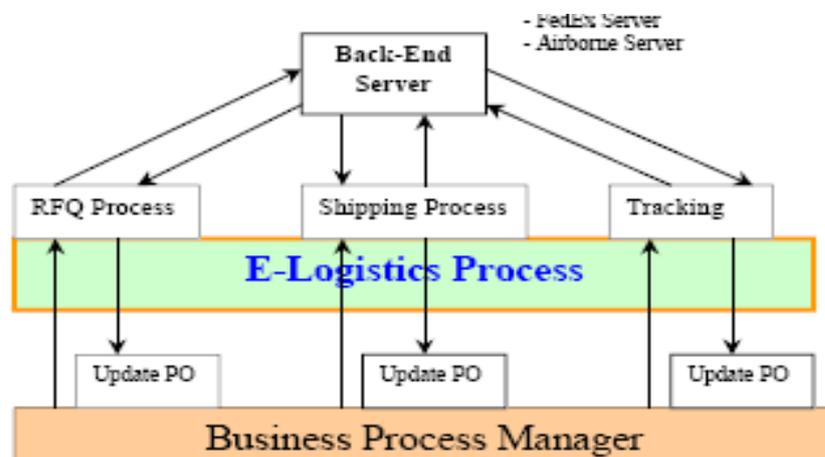
Figure 1: E-logistic Processes Integration Framework [12]

2.5.2 LOGISTICS INFORMATION SYSTEM

Nowadays, E-logistics is based on the information technology in order to succeed to increase the effectiveness of the logistic system and tools. The logistics information system tries to combine all the components of the enterprise such as employees, equipment and procedures in order to

gather all the necessary information for the completion of enterprise purposes. The purposes of the enterprise are closely connected to the logistic information system.

It must be referred that the enterprise purposes are categorised to planning, implementation and control. [10]

➢ Planning: It is based on the information that is given relevant to the conditions that refer to the market. The planning action must inform the enterprise for the sales, the cost of products; prices and to succeed to give a plan for the operations that must be completed.

➢ Implementation: It gives information for the real time thesis of the enterprise. The implementation action is based on the way that the orders, purchase are completed. It also gathers information for the planning and schedule of production, control and transportation.

➢ Control: Control purpose occupied with the operating information for costs and expenses. It provides the appropriate strategy in order to realise the handling of transportation, planning and delivery costs.

2.5.3   E-LOGISTICS ASPECTS OF PROVIDING VALUE CREATION

E-logistics plays an important role to the creation of value to the products and services.

The value that is added in the product beyond the production (situation of readiness) is named place, time and possibility of possession. The activities of logistics provide usefulness of time and place while the marketing provides usefulness of disposal. As it becomes comprehensible the activities of logistics provides improvement in the benefit of product in the right time and place. Thus, an enterprise strengthening these processes acquires an important competitive advantage.

It follows a concise description of usefulness of place and time.

The usefulness of place is the value that is added in the product via the process to become available for purchase or consumption in the suitable part. Logistics are charged with the responsibility for providing local usefulness that attends for the most optimal management of raw material, reserve and final products from the point of production in the point of consumption.

As far as concern the time usefulness is the value that is created making the product available the suitable time moment. However, the products should be ready the moment that the consumer needs them in order to be useful.

Finally, the logistics possess important role to plenty of activities that are realised in and out of the enterprise.

According to Wang [2] that is based on Lambert (2000), economic value-added can be affected by e-logistics in four aspects:

- *"Revenue. The customer service provided by e-logistics can have a major impact on sales volume and customer retention. If the value of the higher level of service is measured and sold to the customer, there will be less pressure on margins resulting in higher revenue.*

- *Operating costs. The potential for operating cost reduction through e-logistics is considerable. A large proportion of costs in a typical business are driven by e-logistics practices.*

- *Working capital. E-Logistics can have a significant influence on working capital requirements. Long supply chains by definition generate more inventories. Order fills and invoice accuracy directly affect the ability to collect accounts receivable in a timely manner.*

- *Fixed assets. Logistics is asset intensive and in many companies the potential for asset reductions is substantial. Investments in trucks and materials handling equipment can be significant as can be the investment in company-owned as well as leased warehousing facilities."*

2.6 FACTORS THAT INFLUENCE THE E-LOGISTICS SYSTEM

E-Logistic system as all the systems is influenced of some factors either internal or external that try to prevent the development of the e-logistic system. It will be analysed some of the factors in order to see the role that they play. [4]

Reliability factors

When we talk for reliability, we talk for the performance of a product to provide the desirable functions. The reliability provides the frequency of maintenance of a product. It is important the reliability to be increased in order to decrease the frequency of maintenance. The systems that do not provide the right level of reliability usually require extensive maintenance.

Maintainability factors

E-logistics system can be influenced of maintenance factors which "play" with issues such as safety, accuracy, easy of the demanding system functions. The maintainability of the system is influenced of the factors that play an important role to the logistic support of the system. These factors are the maintenance frequencies, maintenance cost, personnel labour-hour rates and the combination of elapsed times.

It must be mention that the activities that promote maintenance are organised due to the level of productivity. When we talk for productivity we want to mention issues such as corrective, preventive, reliability, predictive maintenance and self-maintenance.

The time that is needed for maintenance is consisted of particular tasks that are combined to with the appropriate maintenance activities for a system. So, the maintainability has a great power to promote speed and time to a system in order to be maintained.

Supply support factors

The supply support factors try to cover the processes and techniques of management in order to succeed to make them to be acquired, stored, transferred and disposed all the elements that influence the operation of the system.

It must be mention that the support management system is closely connected to the maintenance policy in order to provide the appropriate elements and their supply. It also provides information for the ordering frequency and number of items that are necessary for the transactions.

Test and support equipment factors

The test and support equipment factors are based on issues such as precision electronic test equipment, mechanical test equipment, ground handling equipment, maintenance stands. These factors influence the way that the item must be provided for the needed application to the appropriate position and the demanded quantity.

This category tries to determine the test equipment requirements in order to provide the suitable maintenance and frequency. This is a way to provide the reliability that is needed to the given application..

It must be referred that the test equipment requirements are obtained after the analysis of various alternative combinations of arrival rates, queue length, test station process times, and quantity of test stations.

Organizational factors

E-logistic system is influenced of organizational factors to the level that control and handle organizational issues of a system. These issues are focused on the direct maintenance of labour time for each personnel category, or skill level, expended in the performance of system maintenance activities. It also occupied with the indirect labour time required to support system maintenance activities and the personnel attrition rate or turnover rate.

The personnel training rate or the worker-days of formal training per year of system operation and support is under the organizational issues as well the number of maintenance work orders processed per unit of time.

Finally, this category is influenced of the average administrative delay time, or the average time from when an item is initially received for maintenance to the point when active maintenance on that item actually begins.

Software factors

Software factors play the most important role to the support of the elements that the system is based on. Logistics functions uses software that provides automation, computer applications, digital data bases in order to succeed its goal. As far as concern the development of software is based on issues such as equipment, reliability and quality. This makes the software to be influenced from the way that these issues react.

Economic factor and effectiveness factors

Nowadays the economic issues that are combined with the cost growth of products and the decreasing of the rhythm that people consume consist important factor that influence the system. When we talk for cost we must observe the cost that occurs from the operation and maintenance of the system. The system in order to provide all the desirable requirements must dispose a great number of money. It must refer that the e-logistic systems are cost effective.

The effectiveness factors are based on issues such as the system performance and physical parameters for example capacity, delivery rate, accuracy, speed. These factors are concerned to the operational and support factors of the system such as availability, capability, reliability, transport-ability and maintainability.

2.7 SOFTWARE APPLICATION THAT SUPPORT E-LOGISTICS

In e-logistics, the movement of data is the precursor to moving funds and physical goods. A company that cannot move data instantly, easily and without errors, is doomed to failure. How a company handles data should be such a high priority that it should determine everything from the software packages a company buys to the database systems it uses.

Systems integration must be made a priority from the beginning. Too often, a company will buy systems in a haphazard way, based upon isolated functions within a company. Often the same data is manually input multiple times into multiple systems, creating multiple chances for errors. In e-commerce, trying to piece together a group of "point solutions" does not work – the old way of operating in isolated information silos must be completely dismantled. This usually requires outside expertise to analyze the business processes in each department in an organization, and to start creating communications amongst the various functions. [14]

Once a company has its database and integration issues settled it needs to deal with another key issue of e-logistics: the movement of data and conveying of instructions between the many different entities involved in buying, selling and shipping goods. This is why XML - the Extensible Mark-up Language - was invented.

XML [14]

XML is a cross between HTML—a universal open language that is available to anyone with a Web browser—and the functionality of Electronic Data Interchange (EDI). XML allows the creation of documents that function as both applications and carriers of data.

Pressure for adopting XML has been coming from those companies who, for years, have been using Electronic Data Interchange (EDI) as their means of exchanging messages with suppliers, manufacturers and customers. The upside of EDI is that an EDI message can both notify a supplier that product levels at a remote location are low and trigger shipment levels of products from the supplier to the location. This has made EDI a widely used tool for large organizations from automobile manufacturers to Wal-Mart. The downside is that EDI is rigid, complex, expensive to deploy and maintain, and is beyond the reach of smaller companies. Much work remains to be done on XML, but the languages fundamental capabilities make it a perfect fit for the world of e-logistics, where data and action are so intimately entwined it is often almost impossible to separate them.

CHAPTER 3: E-LOGISTICS ON SOUTH EASTERN EUROPE COMPANIES

A research and analysis have been made to the companies that activated on the South Eastern Europe in order to find the way that use the logistics criteria and principals to its operation. The existence of companies that activated to the logistics area will give us the possibility to take results for what logistics systems are used and how these react to the companies operation. This research is of great importance in order to see how the e-logistics systems can be embodied to these countries relative to the extension of the web services.

3.1 BULGARIA

Bulgaria is a country that is shown a great development in the field of e-logistics. It is consisted of a great number of companies that occupied with logistics processes in order to provide with the best possible way the goods and services to customers.

The strategies that the companies follow in order to achieve these objectives are the enlargement and the establishment of a new network in the European market. E-logistics help the companies to continue to extend its products and services. The companies continue the systematic growth of services which offers additional value. The most important objective of the companies is the achievement of annual growth, the creation of strategic alliances and the investments that will yield satisfactory output onto their capital.

E-commerce logistics help these companies to handle the management of orders, products, and sales and to detect the transports movement. The communication that is provided by the use of internet gives the possibility to these companies to communicate to all the parts that consist the organization of their company.

It must be referred that the companies provide all the types of logistic services from the moment that the product leaves from the company until it reaches to the final destination. Bulgaria is occupied with collection and distribution services. It must be mentioned that the use of e-logistics improve the way that the company support the logistics services, the promotion of products and sales. E-logistics also plays a great role to provide fast service to the order promotion and improve the quality and quantity of products and orders check.

The companies of Bulgaria continue its spread by creating offices in other countries such as Russia, Romania, Turkey and Ukraine. E-logistics helps the offices to have rapid communication and access to all the parts of the main company.

3.2 SLOVENIA

Slovenia is a country that its companies are great organized to provide with the best possible way the logistics services. The companies mainly occupied with product transports among the countries such as Croatia, Hungary, Slovakia, Poland, Romania, and Serbia.

The companies' objective is the adaptation of the requirements that the modern market demand on the transports.

It must be mentioned that the very developed logistics network that allocates is focused to transports by trains or road. This network includes loading, storage and monitoring of looked after goods.

The companies of Slovenia are expert to the use of logistics processes. But if they want to expand and spread their activities due to the modern market they must be adopt an e-logistic procedure. E-logistics will help to have fast and great access to the transports among the countries, to control the products that are stored and have rapid check of product orders. The e-logistic informative system will allow the logistics control.

3.3 CROATIA

Croatia companies' are trying to satisfy the needs of theirs customers. The satisfaction of it is succeeded by using the logistics and especially the e-logistics.

There are companies that have departments in order to handle the products, promotion, services and orders.

The existence of e-logistics helps the companies to give information in order the customer to choose the best product and way of order. E-logistics provide to these companies the best directives for product storage and control the handling of products, orders.

There are companies in Croatia that has a great experience to the product promotion through a network to the entire Croatia. They occupied with the transport organisation in the interior of the country as well as internationally, the product storage, the product handling, the product preparation. These companies have an e-logistics means that help companies to satisfy the customers' needs and provide high quality services.

3.4 ROUMANIA

Rumanian companies are widely recognized in the logistics sector, transports and support services. They are activated not only to entire Romania but also in Eastern Europe. These companies provide modern storage, distribution and complete logistics services to suppliers and custom-

ers in national level. They play a great role to the logistics market. The companies have offices to the entire Rumania in order to serve the customers needs and the requirements of the market.

The objective of the companies is the continuous search of innovation, the flexibility and the daily effort to discover solutions that will satisfy the customers' needs and the market. The development of the companies by following the technology will contribute to the companies to have better product and order control and quality control. E-logistics will help to improve the sales and marketing services as well as improve the logistics sectors. The companies systems will be improved by using e-logistics in order to provide sales, reserves and the economic data of companies.

3.5 SERBIA

Companies that exist and activated to Serbia provide a variety of logistics services in order to serve the customers needs. Most of the companies are connected with a network that is based on computer technology. This is the way to communicate and control the logistics procedures through the offices that exists in entire Serbia.

The logistics services that are realised are the organization of product transport, the preparation of the documents that are needed for imports-exports and the promotion services to exhibition in and out of the country. It is of great significance the way that the companies are trying to handle the product disposal to the customers 24 hour the day, the products presentation to the customers and the way of storage and product management.

The computer technology that is used through an e-logistics system helps the companies to provide the main activities and services with the best possible way in order to satisfy customers demands and needs.

3.6 MONTENEGRO

The companies that activated to Montenegro have as main goal the achievement of the promotion of logistics processes. These companies have extended to other countries such Ukraine, Belarus, Hungary and Germany by creating offices. The use of e-logistics technology helps the companies to provide the most optimal solutions relative to the product transport and customer requirements. Electronic information of product and orders relatives to logistics is one of the most important issues that the companies are trying to succeed by using the e-logistics.

E-logistics contribute to the companies to have main access to pricing operations and to organise the promotion activities as far as concern the orders and products. The companies are also in the position to check and control the elaboration with the suppliers. They can control the customers' orders as far as concern the demand of products and guarantee the delivery period of them.

The computer systems that use have incorporated software that offers flexibility and allows the control of product movement and the direct correspondence to the consumers' requirements.

3.7 GREECE

Greece is a country that is developed to the domain of logistics with a very rapid rate. The main reason of country's growth is the very good environment of business dexterity to all the industrial sectors. The development of retail trade was catalytic for the market logistics extension. The Hungary companies give great importance to the technology allocating a special management program of deposits that adds flexibility and reliability which are essential elements for the continuously developing environment of Greece. This system uses the recent technologies as far as concern the e-logistics processes. Thus, they support with the best way the growth of last years.

The objective goal of the country is to remain the companies focused to the customer in the field of complex logistics services and to offer high added value to the customers as well as to its shareholders. They provide high level of informative technology and communication through the main parts that the company is consisted.

Companies through the use of e-logistics are trying to readjust the way of thinking by taking into consideration the quality, the services, the safety and the added values either internally or externally.

The way that the companies use the e-logistic technology helps them to provide excellent level of customers' service through the company's organisation that is based on experienced informational system to all the administrative and functional levels. Companies are in the position to handle the management system in such way that provide in real time reliable information via sure link in the company's website as well as to its customers via the electronic transport data system. It also provides precise control, high flexibility and optimisation of reserves level.

3.8 TURKEY

Companies in this country have as objective the improvement of its infrastructure and the relative technologies that use with a view to decrease the cost in its logistics processes and its reserves and to increase the level of the services and products that offers to the customers. They are trying to provide service solutions by using its information and achieving completion and visibility through the duration of processes.

The use of the modern e-logistics technology to these companies gives results to the detection of movement of products in each phase of distribution and the evaluation of all electronic data with the achievement of more equitable decisions. They are in the position to handle better the way

that store the data and their statistical analysis for further information. E-logistics contribute in order the companies have more flexible system of pricing and can exchange the electronic data with the customers as well as with the mother company. They can control and check the quantity and quality of the products faster and with a more reliable way. Thus, companies can provide flexibility in the inventory of the products that is fulfilled in weekly, monthly or annual base serving thus better the needs of customers for submission of orders.

3.9 BOSNIA

Bosnia companies are specialised to the domain of logistics by providing services such as storage, promotion of products and orders. The companies provide its customer's one complete package of high quality logistic services that includes international transport from sea, road and via railway as well as storage of goods and customs formulations.

These companies do their best in order to provide high quality of services and guarantee the high efficiency and most optimal collaboration to the customers.

It is of great importance this country and especially the companies to occupy with the development of e-logistics processes and systems in order to help them to obtain better and faster access to all the parts of the company. They will be in the position to represent better the products that are of customers' interest. E-logistics will help companies to make easily the orders' and products' promotion and storage. They can control electronically all the main data of the company and give reliable information to the customers.

3.10 ALBANIA

The companies are specialised for many years in the transport of charges providing exceptional level of customers' services in order to succeed the total satisfaction of them. The companies are consisted of modern and flexible logistics departments which occupied to find ways to improve their logistics processes in order to attract the customers by satisfies their requirements and needs.

It means that the development and approach of e-logistics is necessary in order to complete and support the growth of logistic solutions for the needs of customers. Companies will handle the changes of prices and will be in the position to give reliable price information to the customers and to the interior of the company any time is needed. The companies also can watch the changes to the market. E-logistics can give companies forecasts of products demands depending on the seasonal and other fluctuations. The control of orders and the transportation of them will be observed easily. The collection and treatment of information and report analysis will be in the hands of the company in order to exploit them for the growth of the company.

Generally, e-logistics system will succeed better management and service of customers and support of informative technology

3.11 RESULT OF COUNTRIES RESEARCH

The countries of the south-eastern Europe allocate traditionally big possibilities of production of various products of various types shaping occasions of exports mainly to the Western European countries. This fact constitutes vital piece for the increase of their crude domestic product and their more general economic prosperity. Logistics under the prism of previous analysis created memorable field of research after they have the possibility of influencing considerably these countries.

This admission is shown because of two main characteristics. First as it was mentioned before they are possibilities of production those are developed with the use logistics that will act as a bridge between the countries of demand of relative products. Second comes as consequence of precedent their geographic place find in place key for the conduct of world trade.

The profits therefore that result are direct and indirect. Direct are summarised in the increase of productivity, the minimisation of functional cost and the obliteration of dead time optimising the operational processes. The indirect profits which are also usually ignored due to the weakness of quantification are reported in the processes of satisfaction of customers and the improvement of their place in the market.

In our case and with the condition that the globalisation has changed the world in a "world village" the enterprises of countries of south-eastern Europe wish ardently the creation of powerful competitive place in the world market.

A lot of companies that allocate modern methods of management logistics aim at the fact that they direct the extension of their infrastructures of distribution in selected geographically regions. The countries of south-eastern Europe constitute ideal cases for this aim. They allocate all the necessary characteristics after they contain big rally of suppliers, while simultaneously they create markets with high demand for logistics services.

As it is shown, the South Eastern Europe market is still under development as far as the e-logistics and web services concern. It is obvious that the e-logistics will constitute a huge change to the operation of the companies. E-logistics will exploit the way that the companies control and check their products.

The Web services will enable the development of remote, distributed enterprise applications. Lower costs of integration may also allow businesses to create new business value by improving data exchange in corporations, with business partners and even competitors. The use of Web services will be benefit that will be derived from the technology in the implementation of the logistic

functions. The long term strategic benefits to the organisation are tangible i.e. time and money savings, as the efficient and effective transfer of data between organisations is optimised as a result of implementing Web services.

For that reason we create a fully functional E-commerce site that is based on the web services in order to provide e-logistics criteria and principals. These functions and mechanism of the site can be used from the South Eastern Europe countries in order to succeed to promote their logistic services and management of products with the best possible way.

E-logistics Services will be used to the South Eastern Countries. The companies must become aware of the problems that face to the operation of their traditional logistic systems to issues such as inflexibility, incompatibility, knowledge and information Management. The adoption of e-logistics will pose the appropriate solutions to the e-logistics problem issues. The key factors of the implementation of E-logistic Services in the South Eastern Countries are presented below:

Key factors for the implementation of E-logistic Services in the South Eastern Countries

Issue	Problem Explained	Importance of solution
Incompatibility	Traditional logistic systems among countries tend not to be compatible in their cooperation of other companies	E-logistics will supply a better cooperation among companies, providing compatible systems
Inflexibility	Logistic systems cannot provide additional characteristics for the companies operation.	E-logistics will provide the required information that demanded for desirable company's activities.
Information Management	In traditional systems the exchange of information isn't possible	All the demanded information flow easily by using the e-logistics systems. These systems provide a general improvement of the information Management
Knowledge	There may be knowledge gaps for the development of methods to manage the information	The new systems provide knowledge that actually solves the daily problems of their customers.
Bi-location	Proprietary systems are not Web based and cannot be accessed from multiple locations. Protection of integrity cannot be guaranteed.	The information must be accessible to each party involved in the reverse chain and it must be accurate to ensure that the service organisation can manage the processes effectively.

3.12 PROPOSED E-LOGISTICS ARCHITECTURE

For the above reasons we propose companies to use a system which is consisted of a front-end and a back-end environment that will based on a database. More specific for security and flexibility reasons it will better the use of SQL database.

The below database must include as much as possible tables and connections as the figure 2. We can see the basic tables of customer that contain all the information that is needed. The database contains the products and their details. The biggest part of the database shows the orders and its connection and relations with the other tables that are needed for the completion of the order. These tables and connections are referred to the order items, the shipments, the payment way, and the final part, the invoice. Also, in order the administrator or manager to know where the order is, there are the status codes tables of the order and order items.
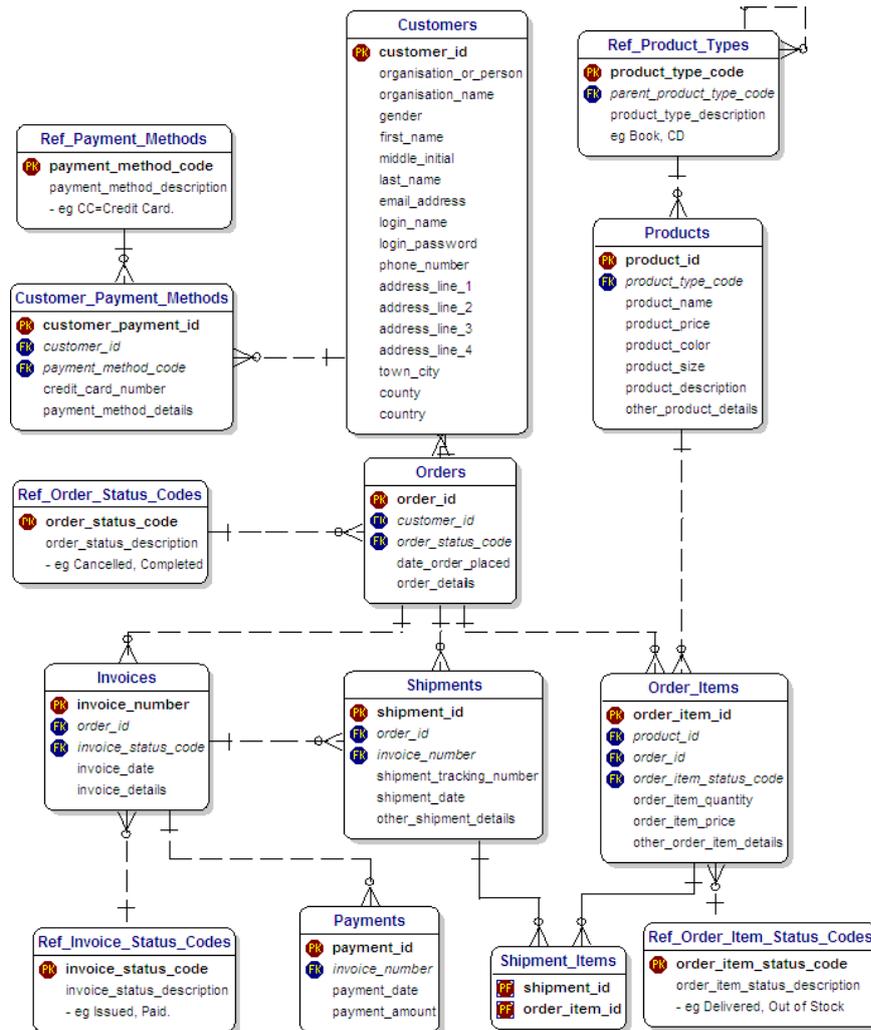
Figure 2: Customer database

Another very important mechanism is the inventory control that must be contained of the database. The inventory control is consisted from two basic elements, first the suppliers and second the products with categories (figure 3). The part of suppliers contains various tables with details for the supplier and what types of product categories are supplied and in what price. In the other hand the product contain tables that give us detail description for the specific product, its category, the

stock level. All the above use queries, connections and tables which must interact together in order to provide reliability.
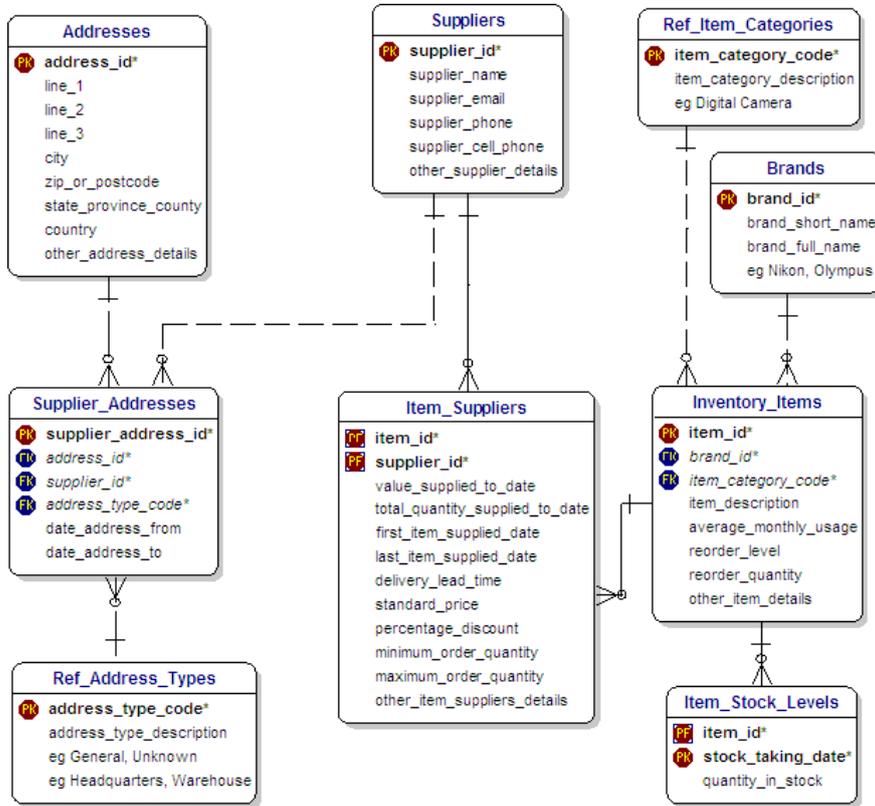
Figure 3: Inventory Control Database with suppliers

Finally, a part of the e-logistics processes is the accommodation of a tracking mechanism. Tracking is the process that handles all the difficult situations that may happen after the shipping of goods.

We need to combine information from inside the database and the others parts. In this database part is used information about the used products, their categories and their problems. It must be mentioned that in the problems part is involved the staff, the category where the problem exists and the status of the problem.
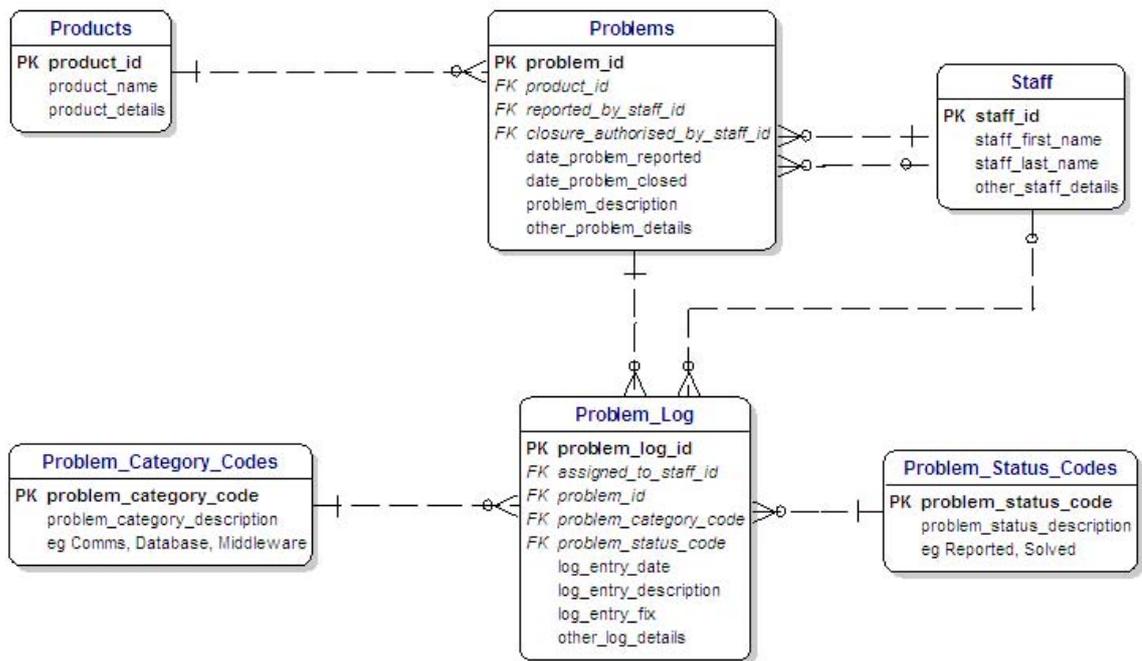
Figure 4: Tracking Database

CHAPTER 4: A TYPICAL E-COMMERCE SHOP WITH E-LOGISTICS

4.1 INTRODUCTION

For the proof of concept of how a typical E –Commerce business should work using the benefits of an online manager administration and basic E-logistics criteria, we created a fully functional E-commerce site.

The environment we used is Microsoft Visual Studio.NET which incorporates web programming development and web services integration through the use of the technology of Active Server Pages (ASP).

The concept of the web site sales category is towards electronics. The reason for picking this concept is two fold: a) there is huge information on the Internet for development of such a site (images we used, descriptions of products, methodology of site navigation and integration etc.) b) Since the concept is towards technology therefore, there is a lot of bibliography and code sniplets to accommodate various subtasks such as: creation of pages for " Request for quotes") in online mode, report integration within the role and access of a site manager and administrator and methodologies for handling shopping carts with a way secure private customer information. We have given the name "PAPPA S.A.E" to the site for obvious reasons.

Presenting the application from the users' point of view, we must say that it includes the following functionalities:

1. Login and Registering mechanism for customers
2. A full navigation of the website and browsing through different categories of products
3. A contact mechanism for the customers to communication with the business manager
4. A business policy that involves clear rules for deadlines for the shipping of products, the sending of invoices and the payment methods
5. An information mechanism for handling problems in the supply chain process such as shipping incorrect products and quoting wrong prices.

We must say that our application is focusing mostly on the Business to Customer paradigm (B2C) and not for Business to Business (B2B). The reason for that is the fact that there are a lot of inconsistencies between the logistic processes that various business use thus making this problem solution difficult for someone to automate.

From the managers' or the administrators' point of view on the other hand the application has been programmed to at least satisfy the following e-logistic criteria mechanisms:

1. A mechanism to edit/update product prices and costs along with an easy mechanism to create business offers to customers.
2. A fully functional mechanism for creating logistical reports. These reports give the ability to business manager to tabulate the sales of the business relative:

   a) To the shipping addresses of the customer.
   b) To the product categories so that we can easily identify the top seller product
   c) To the rate of sales increase or decrease so the manager find critical time periods in the business development.
   d) To the monthly sales of the company making it easy afterwards to create annual reports.
   e) To the margin of profit for each product.
   f) To the available stock giving the ability to the business manager to initiate B2B with the company suppliers for restocking goods and
   g) To the detailed cost description for each product after the offers so that the manager can measure exactly for each product item the profit margin

In the following sections of this chapter we make a detail representation of this application. We keep in the subsections of the above categorization. Thus two sections are following:

1. The section of the Business to Customer web application description and
2. The management and E-Logistics section for the web site administration.

4.2   BUSINESS TO CUSTOMER INTERFACE

The site is consisted of a sidebar which is shown up all the time to the site. Depending on the role of the users, to the sidebar is shown up the permitted functions. The site contains position node that inform the user where he/she found every time that navigates through the pages. The node allows the user to return to the main pages of each category. The user has the possibility any time to view his/her basket. The site provides information about the company and the designer of the site, in that way based we use various controls and Cascading Style Sheets (css).

We must mention that **all** the predefined users have password "**zant412**". The "user names" for the predefined users are: "pappa" as **admin** and **manager**, "Manager" as **manager.** As member users we have predefined, "zavrakas", "nikolaou", "stergioulas", psaropoulos, "kokkinos", "makkos", and "poulios".
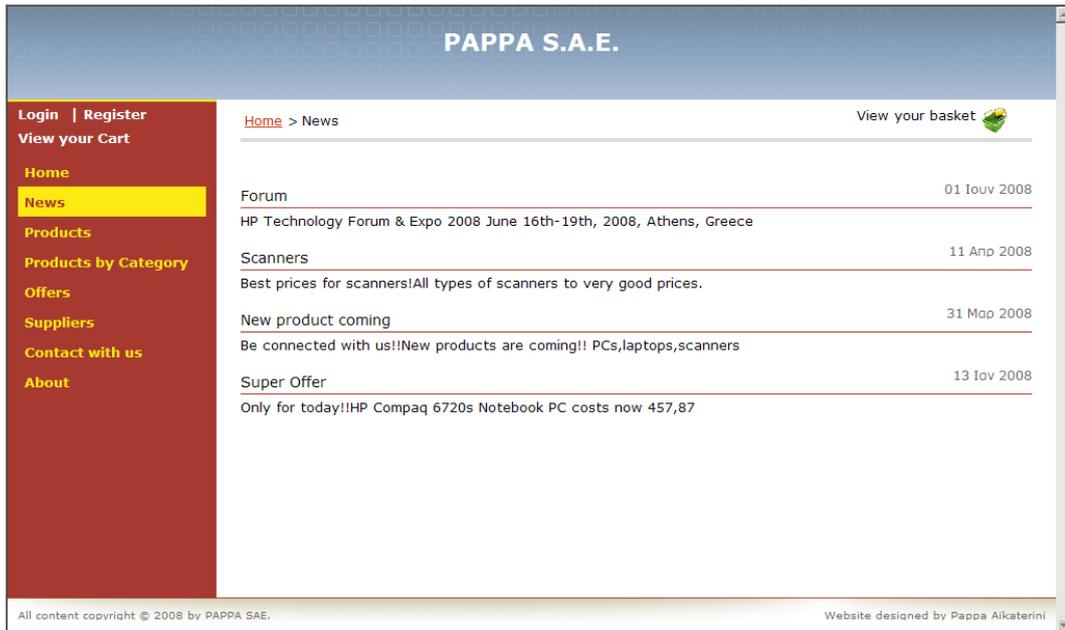
Figure 5: The basic front end of the e-commerce site.

4.2.1 Login and Registering Mechanism

It must be explained that if the user is the first time that visits our site and wants to become a member of it must choose the "register" option from the sidebar menu. The register option leads the user to an application form where the user must to fill up the application form with personal data which are necessary for the company in order to accept this user as a member.

Figure 6: Registering Mechanism.

After the first step the company leads the user to the terms of use that refers to the site (the specific terms are taken from yahoo registration). If the user wants to continue to the next step for becoming a member must accept this terms.
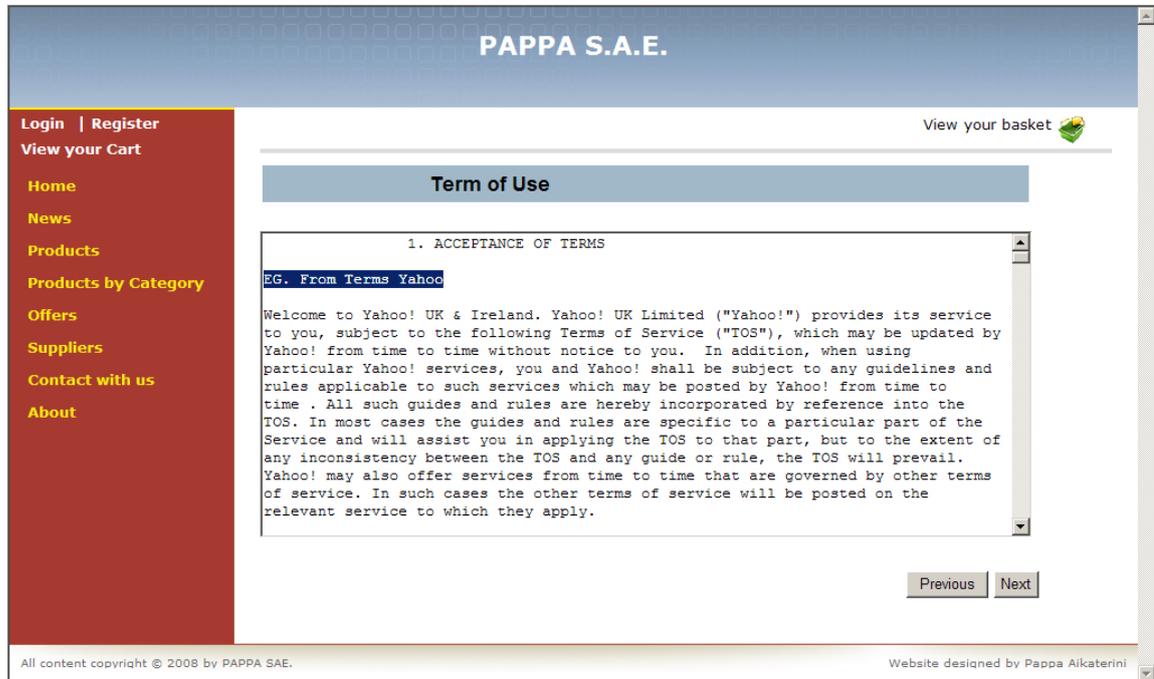
Figure 7: Terms of using exchange security.

The acceptance of terms leads the user to the final step for becoming member. The finish button confirms user registration.

Figure 8: Final step registration.

As it shown up above, the member must fill up its profile in order to avoid every time that he/she makes a product order to fill it up again and again. The profile is important because it provides information relevant to the customer. The customer information is necessary for the realization and delivery of an order.

As far as concern the Login mechanism, it must be referred that this page applied to all the roles that involved to the site. Those roles are the administrator, the manager and the member of the site. The accounts of each role are recognized by the database which gives the corresponding permissions. Those permissions refer to specific menus and functions that can be provided from every role separate.

Figure 9: Login mechanism.

In this point must be mentioned and explained the menus that corresponding to every role of the site. The first sidebar (A) represents the general menu that is accessible to all the users. The second one (B) refers to the member-customer menu. It must be noticed that the name of the customer is shown up to his/her menu. To this menu the customer can edit and update its profile. The customer also can handle and check his/her personal order basket as well as to navigate to all the information of the site. The logout option is given to the customer menu.

Administrator menu (C) opens by showing the name that is declared as administrator. He/she has the ability to administrative the site and the users, manage a variety of company's activities and take reports which refer to the economical state of the company.

The manager menu (D) contains the same functions with the administrator except from the administration of users and site.

General Menu	Member-Customer Menu	Administrator Menu	Manager Menu
Login | Register **View your Cart** Home News Products Products by Category Offers Suppliers Contact with us About	**Welcome, kokkinos** **Logout | My Profile** **View your basket** Home News Products Products by Category Offers Suppliers Contact with us About	**Welcome, pappa** **Logout | My Profile** **View your basket** Home ==================== Administration ▶ Manage ▶ Reports ▶ ==================== News Products Products by Category Offers Suppliers Contact with us About	**Welcome, Manager** **Logout | My Profile** **View your basket** Home ==================== Manage ▶ Reports ▶ ==================== News Products Products by Category Offers Suppliers Contact with us About
A	B	C	D

4.2.2   Navigation of web site – Browsing through products

When the user visits our site, the first thing that appears is the "Home Page". This page is the "Welcome Page" which introduces the company to the user by giving some information and represents the current company's news and events.

Figure 10: Home Page of the site

The general menu of the site contains also the "News" menu which the current news of the company is shown up. The news is refreshed dynamically depending the date. The news is defined by the manager.
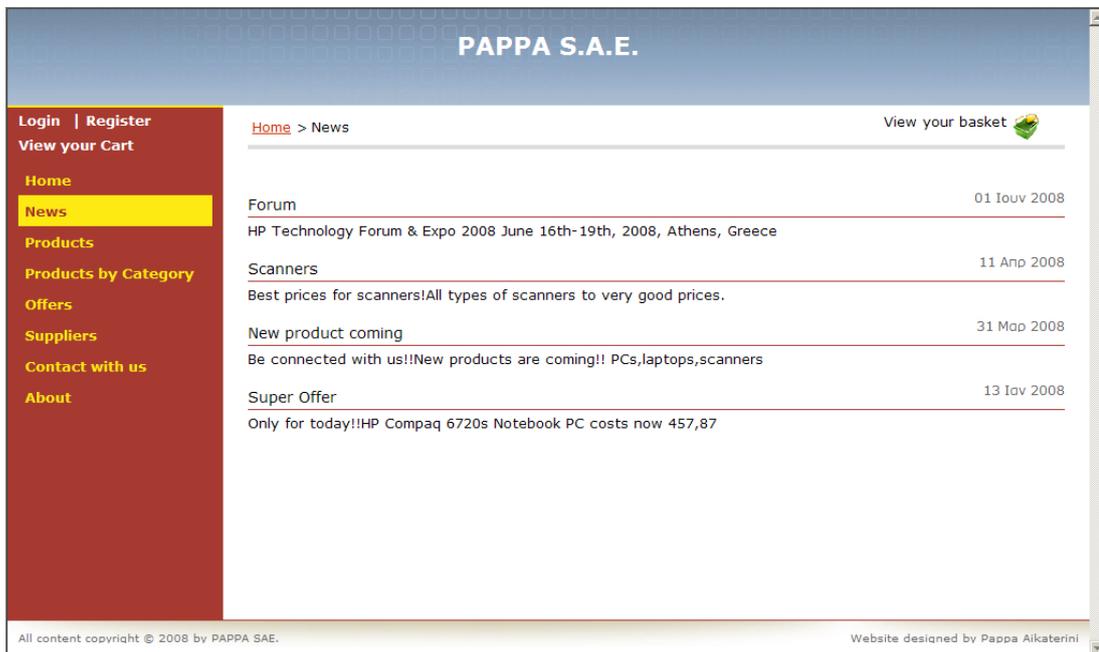
Figure 11: Representation of the News Page

For example, the news that refers to the HP printers doesn't show up yet until the 3rd of June. It becomes coherent to the above figure.

Figure 12: The news that already is shown up and the news that will be shown (yellow color)

As the user goes on to the navigation of the menu meets the "Products Menu". This menu display dynamically includes all the products that are at the disposal of the company. The products are display by alphabetical order.

Figure 13: Alphabetical presentation of the "Products Page"

The menu page "Products by category" gives the possibility to the user to see the products by questing each time the desirable product category.

Figure 14: Products presentation by Category

When the user clicks to the icon of a product, then the details of the product are shown up. The user has the possibility to see the price and the analytically description of the product as well as to add the product to the shopping cart. It must be noticed that the user must login as a member of the site in order to continue to the order procedure.

Figure 15: Product details

The menu "Offers" represents to the user the products that are in its disposal in a better price as an offer.

Figure 16: Representation of products "Offers"

The suppliers of the company are available to the users. This is the way that the company shows that trusts its suppliers and considers its products that are reliable.
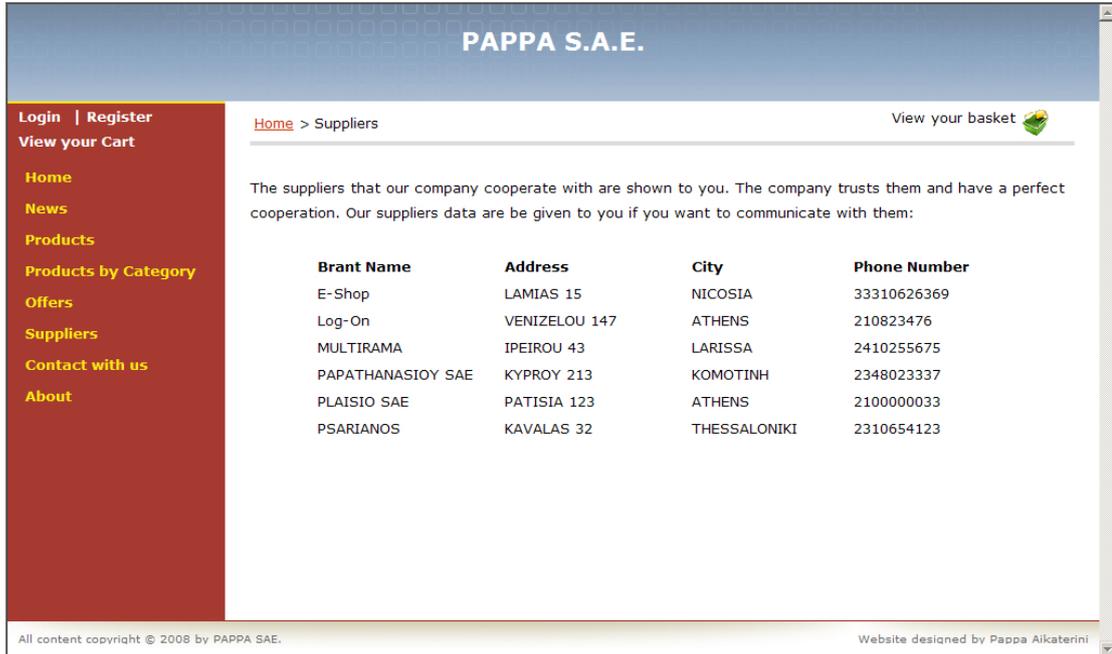
Figure 17: Suppliers Information

The communication with the company can be succeed for the user by connecting to the "Contact with us page". The user fills up the appropriate information and the message that wants to be sent. The user also can select from a dropdown list the company's department that the message wants to be sent for succeed better service.

« **The effect and the role of e-commerce, e-logistics; Research on South Eastern Europe companies'"**
Pappa Aikaterini
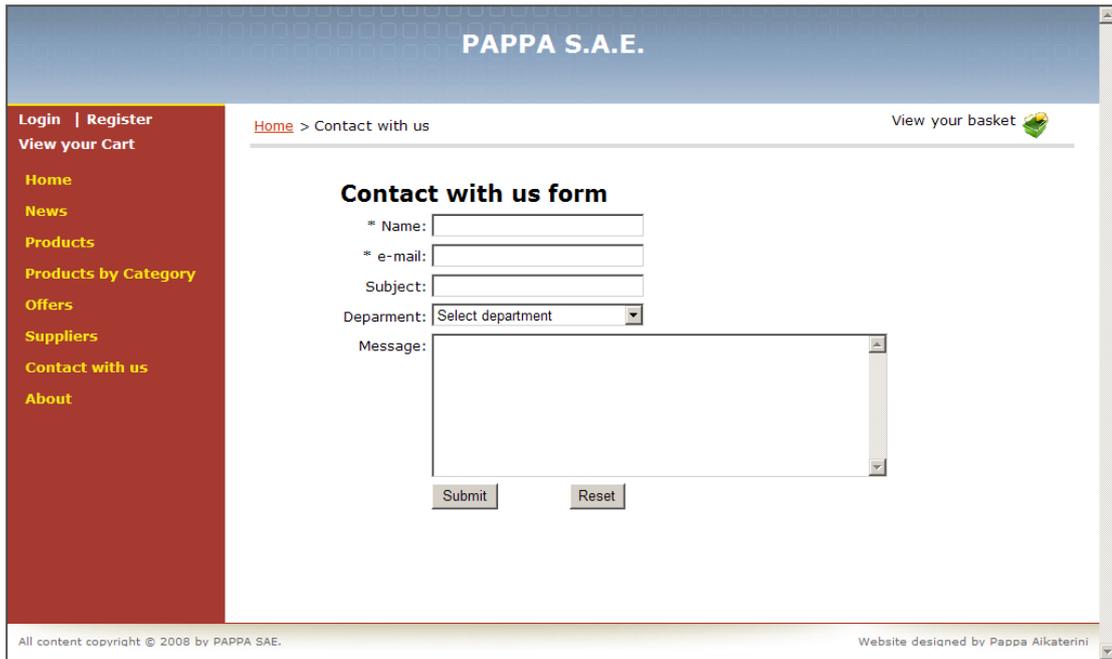
Figure 18: "Contact with us" page

Finally, the "About" menu in real state, includes information about the company and its activities.

Figure 19: "About" page

4.2.3 Business Contact Mechanism

To the general menu of the site everyone has access to the suppliers' information. The suppliers page give information for the companies that supply the company with products, the place that they are found, the address and telephone.

This is the way that the company shows that trusts its suppliers and considers its products that are reliable.

On the other hand it is important to mention the procedure that exists on the manager menu which refers to the insertion, elaboration and deletion of the suppliers. To this page the manager has the ability to add a new supplier by providing the appropriate data filling them to the suitable form. The manager also can select a supplier in order to see more suppliers' details, to edit a supplier, update his/her data or delete the supplier. Every supplier has a unique supplier code which cannot be changed.

Figure 20: Suppliers Information

Figure 21: Suppliers Information and the form which provide the details, edit, and update or delete them.

4.2.4 Business Policy Mechanism

The policy of the site that a company supports is of great significance. Every site must contain and provide to the users the terms of use. It is important to mention that to this company site the terms have been taken from the yahoo registration. The terms of use are included to the registration procedure. The user must accept them if he/she wants to become a member.

The policy mechanism provides to the company reliability and insurance. It provides an agreement between the user and the company for better cooperation.

In a few words, the terms provide the description of service. They declare the registration obligations and the privacy. The terms also provide indemnity for member account and password. Finally, this agreement consist the member conduct with the company.
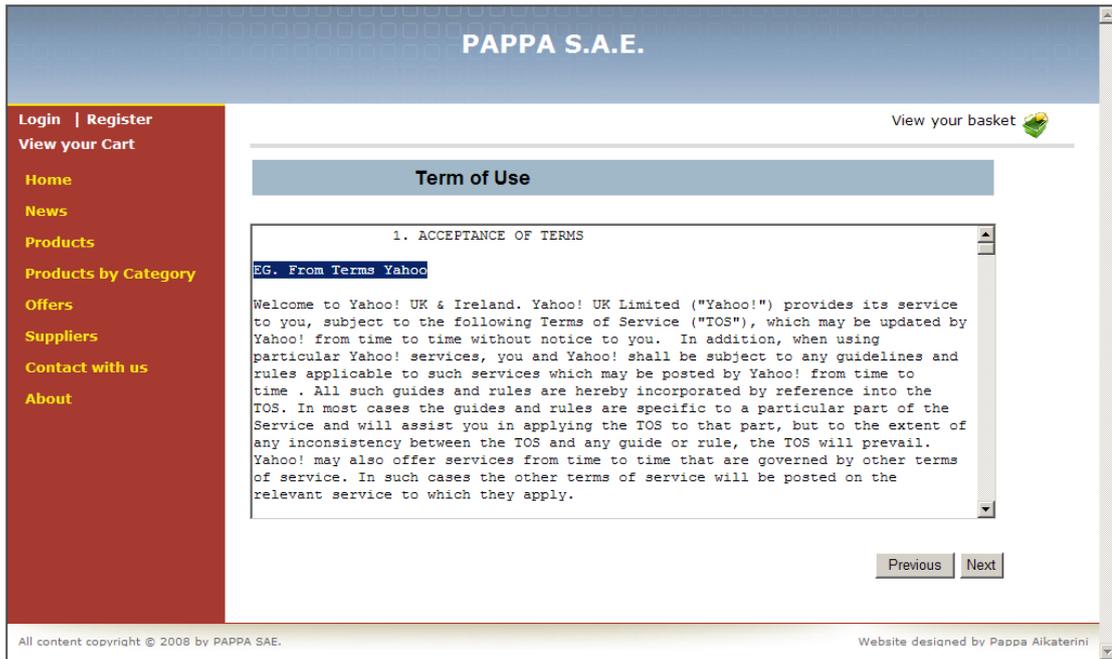
4.2.5 Shopping Carts/ The checkout Process and the Invoice creation

As it is described above the procedure of realizing an order can take place through the "Products" or "Products by category" menu.
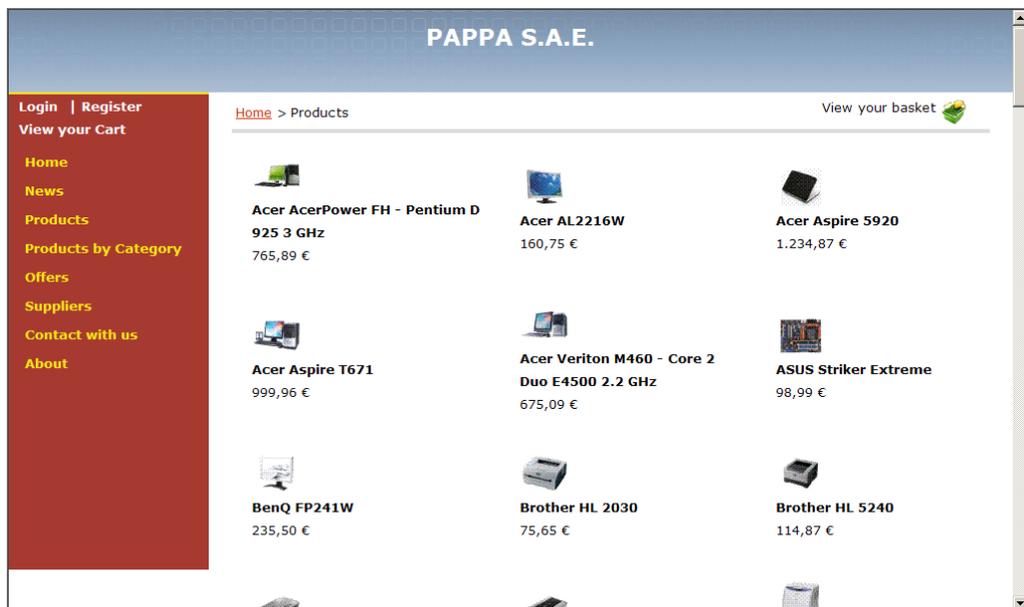
The selection of a product leads us to the "ShopItem.aspx" page (Figure 19) which shows dynamically every time the product that the customer selected. To this page the customer can add the current product to his/her basket. He/she has also the possibility to return either to the "Product" page or to the "Product by category" page.
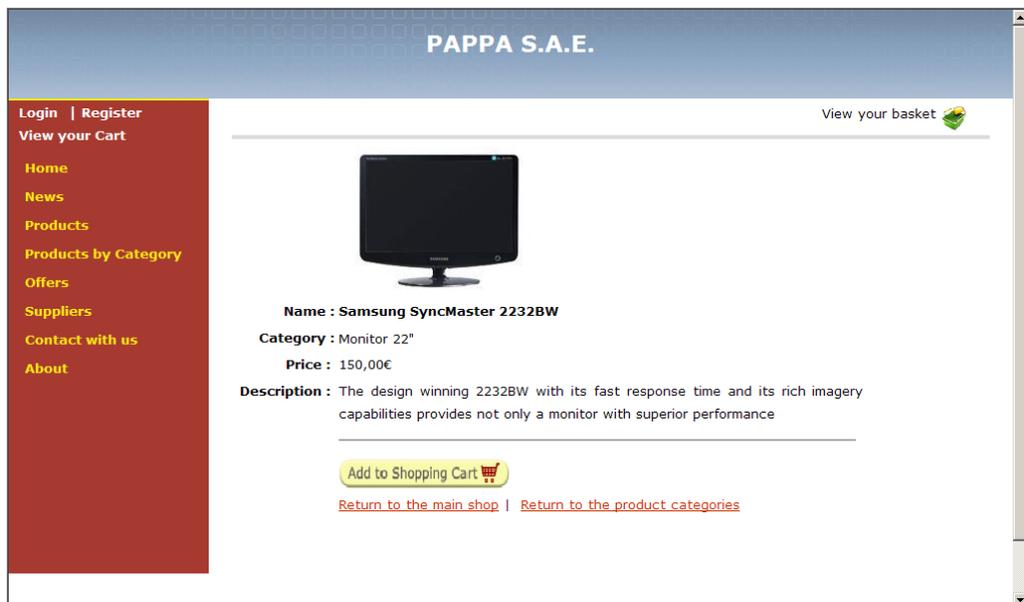
Figure 22: Details of each current product (ShopItem.aspx page)

When the customer clicks to the "Add to the shopping cart", then the product is added to the basket and shown up the page "ShoppingCart.aspx". This page refers to the customer orders.

When the customer basket is empty and a new product is added, then the specific product is shown up with the default value quantity 1. In the situation that the same product that the customer wants already exists to the basket, then the quantity is increased by taking the value 2. In the case that another product that the customer chooses doesn't exist to the basket, then it will be appeared to the basket with the other product choice but in different row.
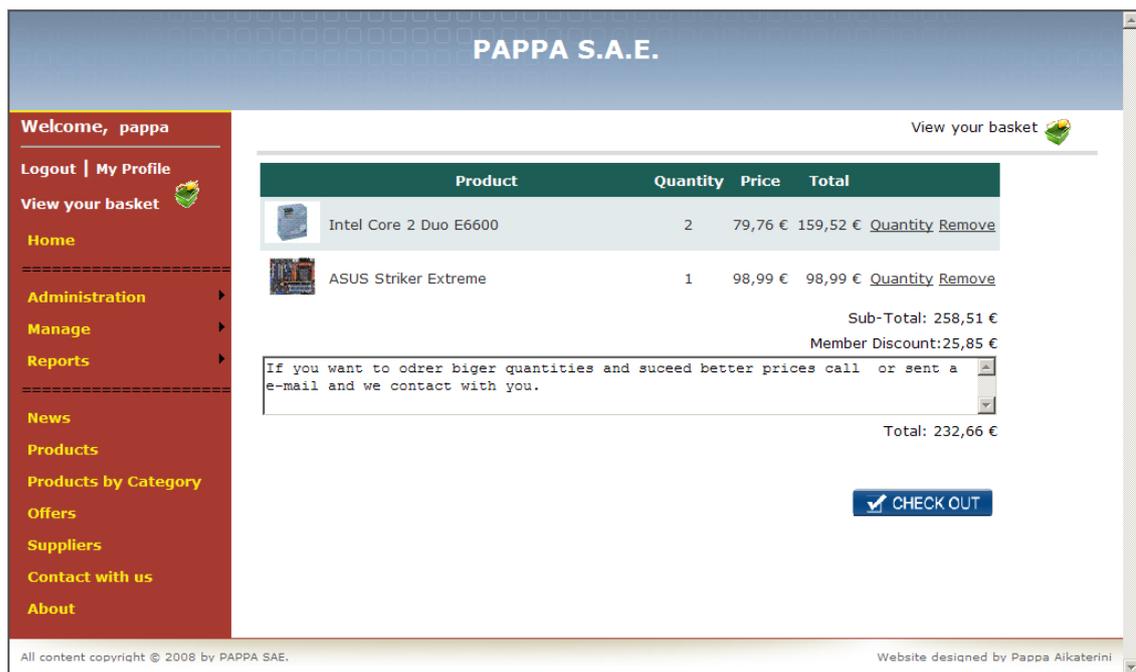
The same appearance of the "ShoppingCart.aspx" to the Visual Studio.Net is the below figure. It represents how the data are dynamically inserted to the control that we use. It also gives us the information if our basket is empty by providing the message "There are no items in your cart. Visit the shop to buy items ". In the case of an error that can be occurred during the ordering procedure, the page displays a message (figure 20)
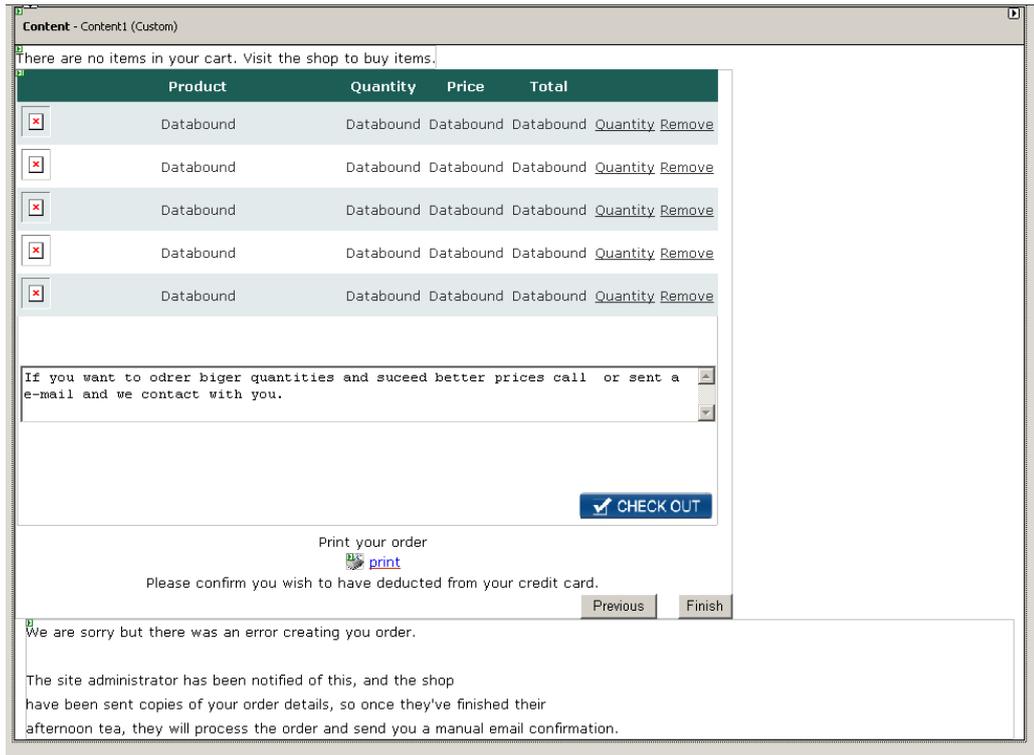
Figure 23: Visual Studio appearance of the "ShoppingCart.aspx"
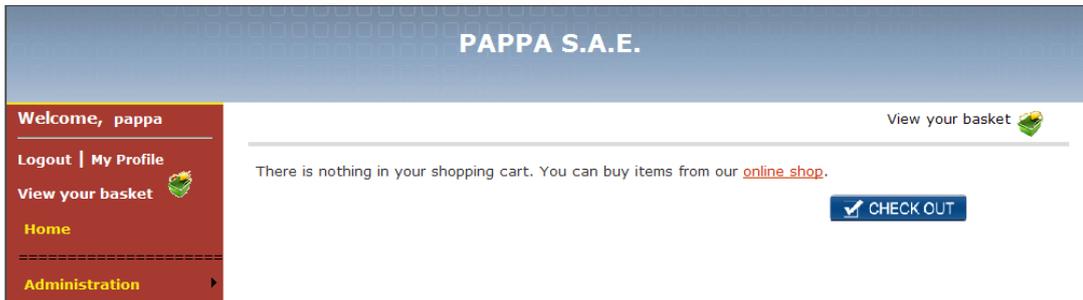
It must be noticed that to the "ShoppingCart.aspx" page can also update the quantity of a specific product that the customer has to his/her basket. When it happens by clicking the update function, simultaneously changes the total amount of the specific product relevant to the chosen quantity and price. The customer can have discounts which subtract of the sub total. The products can be removed of the basket by chosen the remove function.

The page informs the customers that if they want to order biggest products' quantities and succeed better prices, they can communicate with the company by sending e-mail or call. The quantities for which the customer can succeed an accommodation are 10-20, 21-50 and more than 50.

The order procedure is continued by clicking the checkout option. If the customer has his/her own profile filled up then his/her personal data are shown up in order to accept or change them to continue to the next face. It necessary to say that if the customer hasn't his/her profile ready, then the customer has the obligation to fill the profile with his/her personal details.

The next step is the declaration of the customer for the payment method. The payment option that is given to the customer is the different type of credit cards such as MasterCard, classic visa or visa electron. The customer must declare the number of the card and the expired date.

As the customer continues, he/she must declare the shipping way to receive the product order. The customer has to choose among the post way, the courier and delivery by our shop. The expenses of shipping ways are given from a table that exists in our database. There is a variety of the given prices relatively to the shipping way.
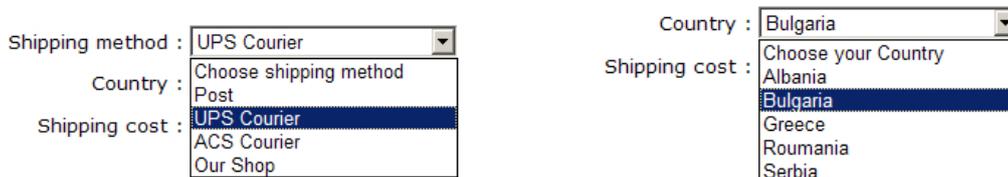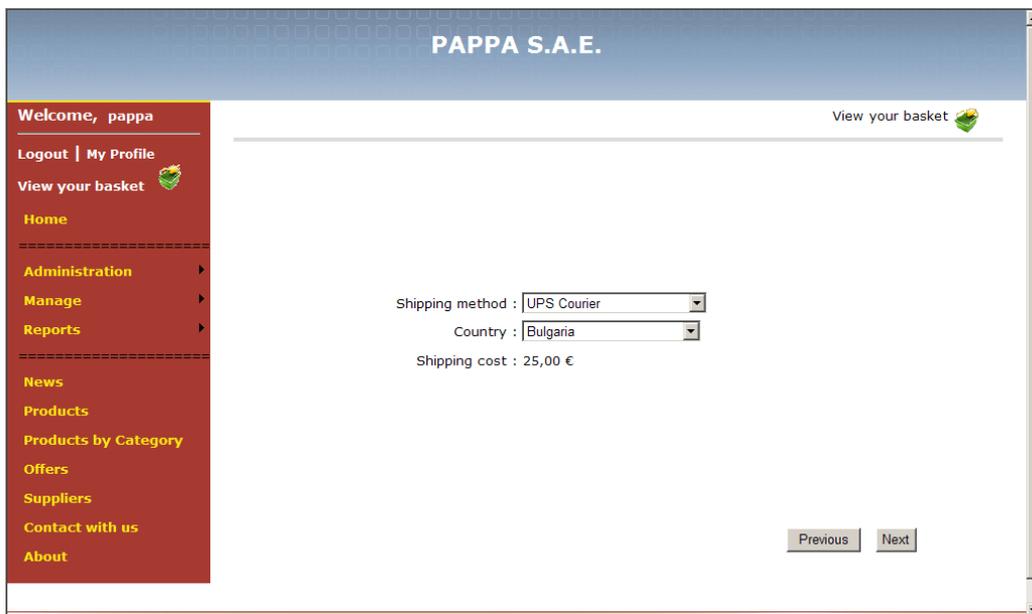
Finally, before the completion of the order, the customer is in the position to see the products that chose, their price and quantity as well as the customer can print out the invoice of his/her finally order.

4.3   User management and administration

The management and the handling of the users are realized only by the administrator. The administrator has access to the admin page (figure 21)
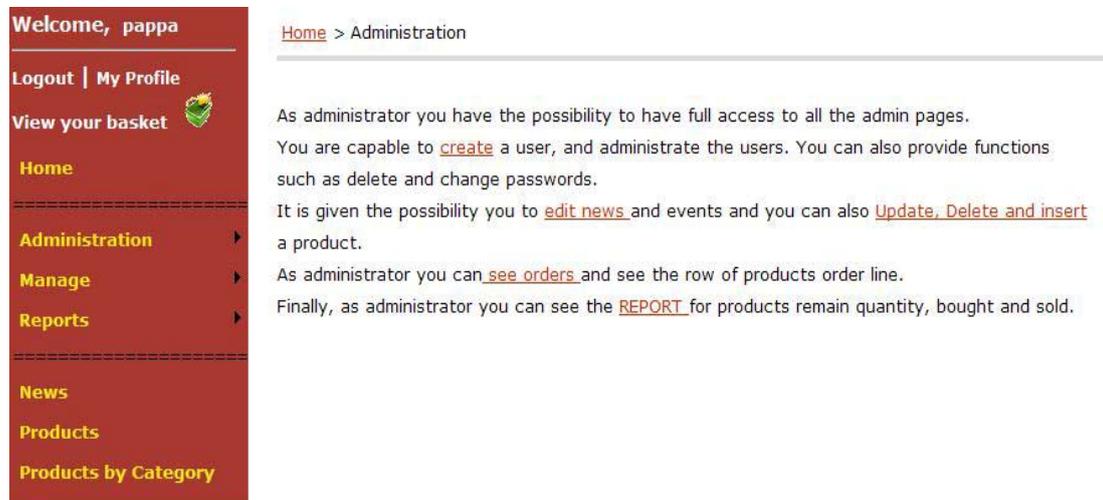
Figure 24: Main administration page

As it is shown the administrator is capable to create a user and elaborate its details. The administrator provides function such as delete user and change passwords. Administrator also provides multiply functions such as manage and reports which will be explained later.
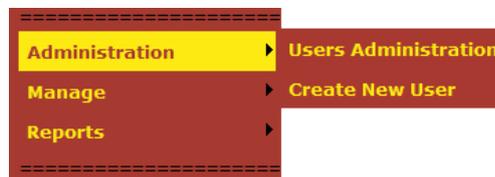
Figure 25: Main administration menu
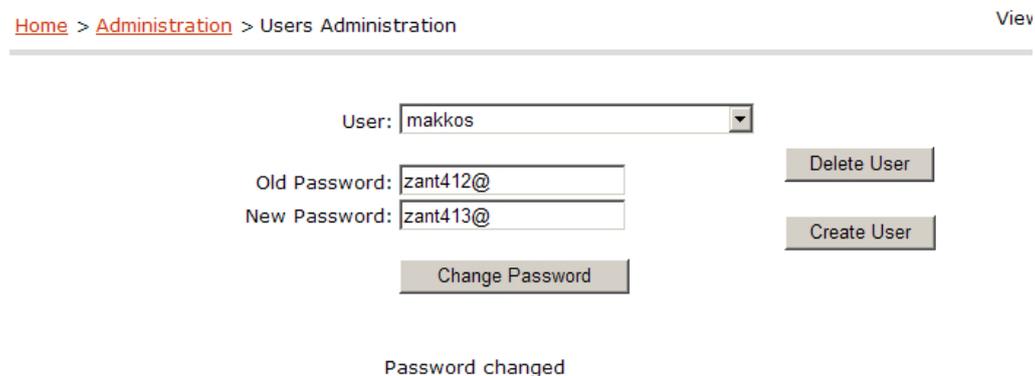
Figure 26: Administration function change password

Figure 27: Administration function, delete a user

4.4   Management and e-logistics

The first page that the defined user sees when visits the "Manage" menu give to the user information about the issues that can handle.

Figure 28: Main management page

The user is able to manage the products and general the product's orders. He/she can handle the product's orders. It means that the user can edit or cancel an order. User is capable to add a new product and also to modify the details of a product such as price, product's description.

The possibility to see the product's row per order is given to the advised user as well as to see the state of products that have been ordered. The news and the events can be edited by the user

in order to handle them. Finally, the advised user can edit the suppliers that the company cooperates and fill up their data.

Figure 29: Management menu

4.4.1 Edit update products and products prices

The products are shown up to the product management menu in order to be handled and elaborate them.
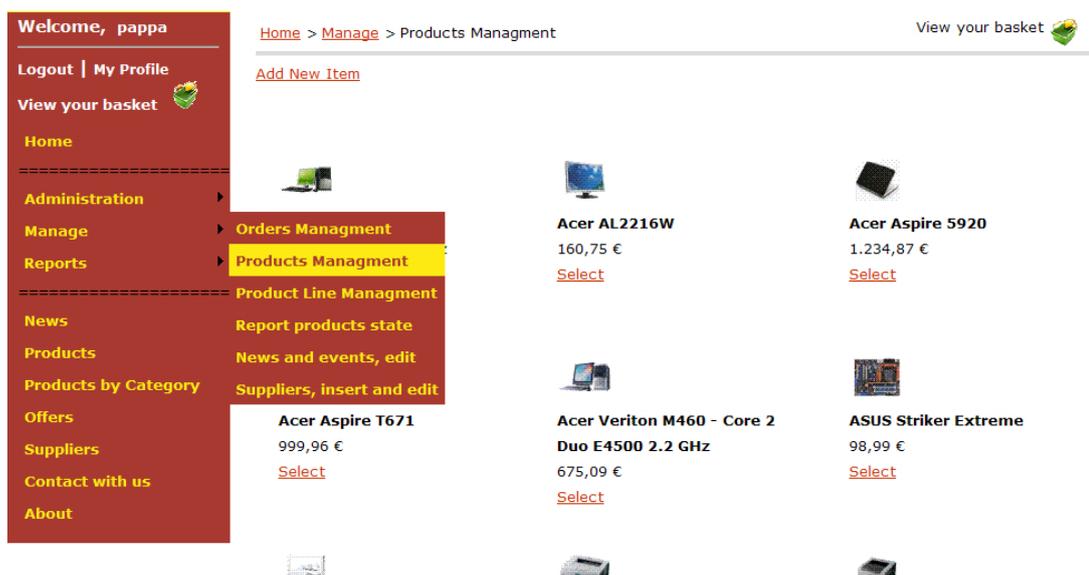
Figure 30: Products management central page

It must be mentioned that the first thing that is provided to the product management is the ability to add a new product. This option allows the completion of a great number of product details that are necessary for the right product description and promotion. The fields that are filling up are the product name, the product category, the brand name of the supplier, the items that are initially bought of the company and has been stored as well as the product cost of each separate item and the price that the product will be sold. An analytical description of the product and its charac-

teristics is given. To the product management is also a field that occupied with the products that the company set them to offer.

Figure 31: Update function mechanism

As far as concern the product picture that will be appeared to the site there is a specific procedure of its insertion. The products pictures must show up with specific dimensions. The usage of a mechanism that provided from the "*ImageHandling.cs*" allows the conversion of the picture. It gives the ability by taking a product of the "*ProductImages*" folder that exists inside the site to convert the initial picture to the desirable dimensions that are "thumbnails".

This mechanism also auto create a picture file inside the "*ProductImages*" folder with the same name as the original picture file but with the prefix "thumb_" in the frond of the picture name.

In this point it is important to be mentioned that the picture that has the format "thumbnails" is shown up to the "Offers", "Products" and "Products by category" menu. The initial picture appears only when the user wants to see the more details of its products by clicking on the thumbnail picture.

After the explanation of the desirable format of the picture that is needed, it is time to refer to the upload way of the picture to the site. Inside the mechanism of add a product, there is a field "PictureURL" that contains the "search" button. By clicking on it, the user search on the site in order to find the "ProductImages" folder. To this folder, the user selects the initial picture. The picture appears to the field left of the search button. The realization of the picture insertion is com-

pleted by using the upload function "*PictureUpload.ascx*". This function is provided by the "upload picture" button. After the upload realization the picture name appears above the search button and the message "Your file was uploaded successfully" complete the upload procedure.
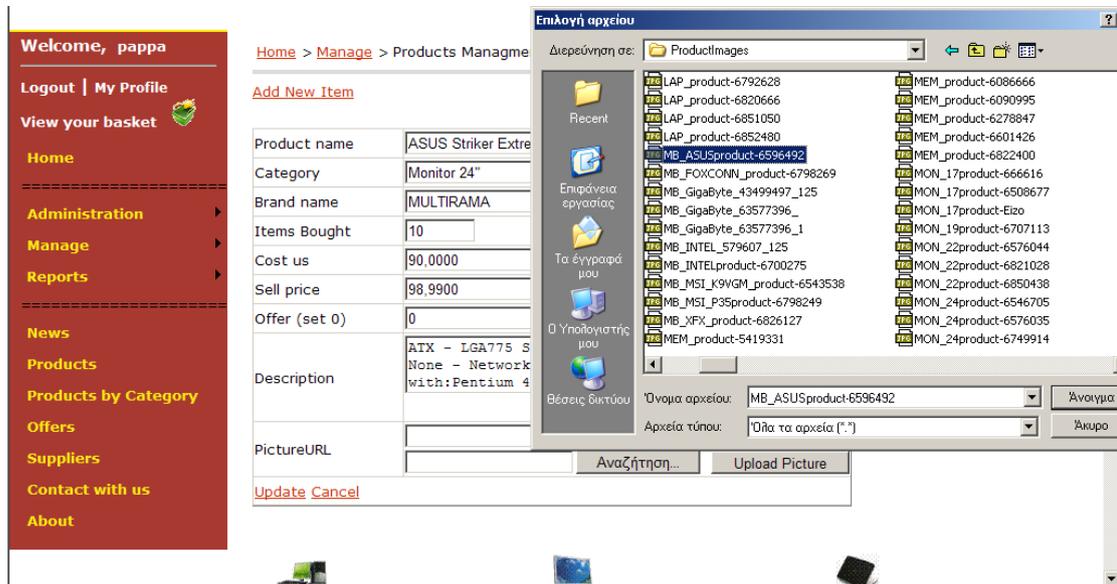
Figure 32: Picture upload and creation thumbnails mechanism

After all these procedures the new product can be inserted to the site by clicking on the "Insert" function.

It must be mentioned also that the user has the option to update or cancel a product.

Add New Item

Product name	ASUS Striker Extreme
Category	Monitor 24"
Brand name	MULTIRAMA
Items Bought	10
Cost us	90,0000
Sell price	98,9900
Offer (set 0)	0
Description	ATX - LGA775 Socket - None - Sound card - None - Network adapter - compatible with:Pentium 4, Core 2 Quad, Core 2 Extreme,
PictureURL	MB_ASUSproduct-6596492.jpg Αναζήτηση... Upload Picture Your file was uploaded successfully.

Update Cancel

It is important to refer that the user must fill up all the details of the product. If some information is missing then a message is displayed that warns the user.

Home > Manage > Products Managment

Add New Item

Product name	ASUS Striker Extreme
Category	Monitor 24"
Brand name	MULTIRAMA
Items Bought	10
Cost us	90,0000
Sell price	98,9900
Offer (set 0)	0
Description	*
PictureURL	MB_ASUSproduct-6596492.jpg Αναζήτηση... Upload Picture

Update Cancel

• You must enter a description

Add New Item

Product name	Acer AcerPower FH - Pen
Category	Desktop
Brand name	MULTIRAMA
Items Bought	20
Cost us	760,0000
Sell price	765,8900
Offer (set 0)	1
Description	PC – Mini Tower – RAM: 1 GB – DVD±RW
PictureURL	PCS_product-6758832.jpg
	Αναζήτηση... Upload Picture

Update Cancel

Home > Manage > Products Managment

Add New Item

Product name	Acer AcerPower FH - Pen
Category	Desktop
Brand name	MULTIRAMA
Items Bought	20
Cost us	760,0000
Sell price	765,8900
Offer (set 0)	0
Description	PC – Mini Tower – RAM: 1 GB – DVD±RW
PictureURL	PCS_product-6758832.jpg
	Αναζήτηση... Upload Picture

Update Cancel

Figure 33: Setting a product to offer (set 0)

4.4.2 Create business offers

The products offers plays important role to the strategic that the company follows. The reason for a company to make products offers is to attract and allure the customers to buy a product. The company may also want to get rid a product because it has remained as stock to the storage for a long time ago. When the price of a product falls relative to the buy price, the company in order to decrease the loss set this product to offer.

Figure 34 : Value 1 doesn't declare offer

The procedure of the company manager to set a product to offer is realized through the "product management" menu. The manager selects the product that wants to be to offer state. The details of this product are shown up and by edit the product; the manager can change the offer status. When the offer status is 1 (figure 31), then the product isn't at offer (figure 32). The change of offer status to 0(figure 33), declares automatically that the product will be at the offer state (figure 34). This product appears dynamically to the offers page.

Figure 35 : Offers before changing the product state

Figure 36 : Value 0 declares the product to offer
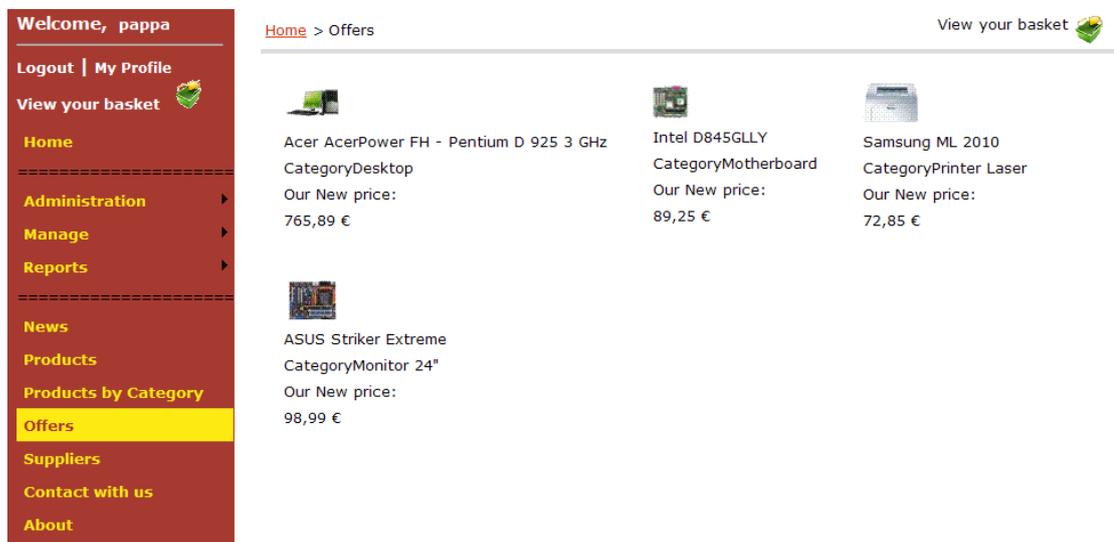
Figure 37: After setting 0 the product appear to the offers dynamically

4.4.3 Orders Management

The eurythmy operation of a company is based on the right management of orders. The company must be in the position to know the status of an order. For example if an order has been completed or the order is stand by. The reason for that is the company to have knowledge about the products state.

To the Orders management page the manager has detailed information about the customers' orders such as the name, the date of order, the city, the discount of a customer and the order amount. The manager has the ability to see analytically every order by editing to its one. In this point the manager is in communication with the storage in order to have the right information about the product disposal. The storage checks the remained product quantities in order the manager to be in the position to know the products availability.

The issue that the manager takes care is to check and define the date and the time that the order will be promoted from the storage in order the product order to reach to the final acceptor (customer). If a product isn't available the manager can cancel the order. The manager must inform the customer about the cancellation or the non- availability of the specific order.

Home > Manage > Orders Managment   View your basket

	OrderID	Order Date	Sent Date	Customer Name	County/City	Discount	Total
More Details..	1	29/1/2008	2/2/2008	Pappa Katerina	Larissa	0,00 €	65,55 €
More Details..	2	1/1/2008	4/1/2008	POULIOS THOMAS	KATERINH	0,00 €	29,10 €
More Details..	3	8/1/2008	25/1/2008	Pappa Katerina	Larissa	0,00 €	47,10 €
More Details..	4	9/1/2008	14/1/2008	MAKKOS FOTHS	ATHENS	0,00 €	98,99 €
More Details..	5	11/2/2008	14/2/2008	STERGIOULAS FOTHS	GREVENNA	0,00 €	65,77 €
More Details..	6	21/2/2008	24/2/2008	NIKOLAOY GEORGE	KARDITSA	0,00 €	906,60 €
More Details..	7	21/2/2008	29/2/2008	MAKKOS FOTHS	ATHENS	7,98 €	71,78 €
More Details..	8	28/2/2008	2/3/2008	MAKKOS FOTHS	ATHENS	25,85 €	232,66 €
More Details..	9	1/3/2008	4/3/2008	Pappa Katerina	Larissa	13,47 €	121,19 €
More Details..	10	3/3/2008	9/3/2008	Zavrakas George	ATHENS	49,79 €	448,15 €

1 2

	OrderID	Order Date	Sent Date	Customer Name	County/City	Discount	Total
More Details..	11	5/3/2008	2/3/2008	PSAROPOYLOS NIKOS	THESSALONIKH	250,10 €	2.250,88 €
More Details..	12	7/3/2008	2/3/2008	POULIOS THOMAS	KATERINH	109,28 €	983,48 €
More Details..	13	15/3/2008	2/3/2008	POULIOS THOMAS	KATERINH	16,97 €	152,69 €
More Details..	14	1/6/2008		NIKOLAOY GEORGE	KARDITSA	36,55 €	328,98 €

1 2

More Details..	14	1/6/2008	NIKOLAOY GEORGE	KARDITSA	36,55 €	328,98 €

1 2

OrderID	14
Date Order	1/6/2008 5:17:59 μμ
Sent Order Date	
Member Name	nikolaou
Customer Name	NIKOLAOY GEORGE
Address	LARISHS 20
County	KARDITSA
Post Code	45555
Country / City	Greece
SubTotal	365,5300
Discount	36,5530
Total	328,9770

Update Cancel

Figure 38: Chosen order for insertion date, that the order sent to the customer

More Details..	14	1/6/2008	NIKOLAOY GEORGE	KARDITSA	36,55 €	328,98 €

1 2

OrderID	14
Date Order	1/6/2008 5:17:59 μμ
Sent Order Date	2/6/2008 5:17:59 μμ
Member Name	nikolaou
Customer Name	NIKOLAOY GEORGE
Address	LARISHS 20
County	KARDITSA
Post Code	45555
Country / City	Greece
SubTotal	365,5300
Discount	36,5530
Total	328,9770

Update Cancel

The manager is in the position to derive information about the price and the quantities of products. The manager has analytically the representation of each product that has been ordered.

The report gives details for product to specific categories relative with the price that was sold, the price that was bought, and the quantity that has been ordered in comparison with the bought items.

The manager can check for every order the detailed characteristics of the products. But the most important is the fact that can see the product row that defines an order.

4.4.4 E-logistic Reports

An E-logistic system is based on orders, sales reports, sales analysis, and storage reports. This shows the significance of reports to the management and the economic handling of the company.

A fully mechanism of creating e-logistics reports has been provided through the functions of the site. The e-logistics reports give the ability to the business manager to tabulate company's data such as orders, sales, quantity and products.

It is important to mention that the reports contain additional functions for having direct access to specific demanding information. The "find" function allows the manager to search for a specific data among a great number of report data.

The manager has the possibility to save the current state of report either for later use or to be sent by e-mail to other members of the company. This is provided by the export function that allows the manager to save the report either to Excel or Acrobat (pdf) format.

Figure 39: Find function

Figure 40: Select an export format

Figure 41: Choose an export format

The first report is referred to the available stock of products. It is a representation of each product, its cost and price as well as the bought product quantity, the sold product quantity ("Quantity") and the remained product quantity.

This report gives the ability to the manager of the company to be informed in any time about the state of the products that exists at the storage, the current orders that have been accomplished and the current storage stock. The availability product stock gives the ability to the manager to check and control the storage and to initiate B2B with the company suppliers in order to restock the products.

ID	Product Name	Cost	Price	Bought Items	Quantity	Remain Items
70	Kingston DRAM 2 GB	60.00	65.55	5	1	4
78	Kingston DataTraveler USB flash drive	20.00	14.55	5	2	3
79	SanDisk Cruzer Micro	10.00	23.55	5	2	3
20	ASUS Striker Extreme	90.00	98.99	10	1	9
76	Hitachi TravelStar 7K200 200 GB	80.00	65.77	5	1	4
86	Canon CanoScan 8800F	180.00	198.88	5	3	2
75	Freecom Hard Drive Hard drive 500 GB	150.00	154.98	5	2	3
45	Intel Core 2 Duo E6600	70.00	79.76	3	2	1
18	Dell SE198WFP	100.00	165.98	5	3	2
66	IBM System x3650 7979	2,040.00	2,500.98	5	1	4
54	HP 530	895.00	925.66	1	1	0
41	HP Business Inkjet 1200d	100.00	167.09	11	1	10
31	HP LaserJet P2015dn	160.00	169.65	1	1	0
19	HP LP3065	300.00	345.54	4	1	3
80	Integral Courier	10.00	19.99	5	1	4

Figure 42: Report available stock of products

Another report that automatically is generated is the "Margin of profit" report.

An analytical report for products relative to the cost, sell price and the amount of profit or loss are represented to this report. The result of it is very important to the manager in order to make economic statistics and be in the position to handle the economic company state.

The margin of profit for each product that is given plays a great role in order the manager to proceed to product price increase or product price decrease. The price decrease will be happened relative to the margin of profit that the company had in order to succeed more sales and attract the customers.

Moreover, additional information can come over from this report. Studying the manager this report can decide for a specific product promotion. If a product has high margin of profit, then additional effort should be engaged to increase the sales. As a result, the company will achieve higher profits. Furthermore, this report provides valuable information about the general strategy of the company allowed the manager to direct the sales management of the company to certain products.

Figure 43: Report Margin of profit

The report that refers to the "cost report per unit" as it is shown below is concerned to the company suppliers.

There is an analytical report for each supplier relative to a specific product about the product quantity that has been bought, the cost per unit and the total amount that the company pays to each supplier for a specific product.

Figure 44: Report, cost report per unit.

The company for promoting its sales or to give emphasis to the product marketing must be in the position to know some important information relative to the sales that are realized to its city, the product category which realizes the maximum and minimum of sales as well as what sales and the product quantities of the sales are realized to its month. All this data help manager and the statistic analyst to take useful information in order to plan the sales strategy that the company must follow.

For example, the Christmas period that the sales are increased by using the older report the manager will be in the position to know what product category has the maximum sales. Then the manager knowing the possible quantity of sales has the possibility to compare these results with the available quantity from the report that provides the remaining quantity. In this way the company will supply more products for the specific category.

Another example for that is that the company can proceed to product offers during periods of decreased sales. As a result is succeeded the increase of company general sales.

Figure 45: Report, sales by choosing a desired city.

Figure 46: Report, sales by choosing a desired product category

Figure 47: Report, sales by choosing a desired month.

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4.5 Conclusion

Many businesses are realizing that e-logistics are critical to their growth and success. They are also realizing the unique complexities and challenges of these activities versus those of traditional logistics. The obstacles that developing countries face in implementing e-commerce logistics are made even greater by the additional challenges of delivering the goods ordered online, and by meeting customer expectations after the sale. It is anticipated that many of the same technologies and improved business practices that will facilitate improved e-logistics will allow many participants to cooperate more closely than ever before.

The South Eastern Europe countries face problems to adopt e-logistics to their systems. These countries provide a great number of logistic services and activities. It is an economy under development due to the great growth of their companies. So, it is necessary to mention that the improvements of e-commerce logistics will help them to be increased in trade and develop company's functions and benefits.

The importance of the companies to provide communication among the logistics processes and services leads us to the creation of an e-commerce site that is based on the logistics criteria and principals. This e-commerce logistic site is based on the business to customer approach. It is a proposal that can be used of the companies in order to provide with the best possible way their orders, products, payment and shipping methods. It can be used due to the demands of each separate company. It can be adjusted and modified in that way that allows the companies to improve their operations and services. The site uses a well organised fragmented database which can be used as the base of a small ERP system. Companies can be in the position to modify the database due to their needs. The code that the e-commerce logistics site provides is changeable for every company. It is a result of the way that the companies want to extend, develop and use the site for succeeding their purposes and goals.

BIBLIOGRAPHY - REFERENCES

[1] Blanchard, B.S., (1998), *Logistics* Engineering and Management, 5th Edition, Prentice-Hall, 1998.

[2] Cheng Wang, Yue Chen, Utilizing e-Logistics Case Studies in Sweden and China, Luleå University of Technology 2006

[3] Don Benson, Ralph Bugg, Geoffrey Whitehead, *Transport and logistics*, New York Wood-head- Faulkner 1994

[4] Douglass M Lambert, James R Stock*, Strategic logistics management, Homewood, Il Irwin 1993

[5] E-Commerce and Development report 2001

[6] Efthimioglou P, Operational Strategy, Thessaloniki 1990

[7] Fawceh,R McLeish I Ogden*, Logistics management*, Pitman Publishing 1992

[8] Fred A Kuglin, Customer-centered supply chain management, American management Association Amacon 1998

[9] J.T.W. Damen, Customer controlled e-logistics

[10] James c. Johnson, Donald F Wood, Daniel L Wardlow, Paul R Murphy Jr, *Contemporary Logistics* 7th edition Prentice Hall 1998

[11] Lei Fang, Chuan-qin Zhang, The E-Logistics Framework in E-commerce, School of Management and Engineering

[12] Liang-Jie Zhang, Pooja Yadav, Henry Chang, Rama Akkiraju, Tian Chao, David Flaxer, Jun-Jang Jeng,ELPIF: An E-Logistics Processes Integration Framework Based on Web Services

 Martin Christofer, *Marketing logistics*, Oxford Butterworth Heinenann 1997

[13] N.Viswanadham & Roshan Gaonkar, *E- Logistics Trends and Opportunities*, The Logistics Instute Jan 2001

[14] Deborah L.Bayles, "E-logistics and e-fulfillment: Beyond the "Buy" button", Unctad Workshop, June 2002

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Relevant Websites

[15] http:// www.DACODA.ro

[16] Council of Supply Chain Management Professionals (CSCMP). Available in: http://www.cscmp.org/.

[17] Electronic Data Interchange Available in: http://en.wikipedia.org/wiki/

[18] Greek Company of logistics Available in: http://cordis.europa.eu/

[19] http://www.transped.co.yu

[20] http://www.airkargo.sia.lv

[21] http://www.alpetour-dd.si/ang/index_en.htm

[22] http://www.ARGO.sk

[23] http://www.averscentrs.com

[24] http://www.ballauf.gr

[25] http://www.carel.gr

[26] http://www.contimer.ee

[27] http://www.discordia.bg

[28] http://www.e3pl.gr

[29] http://www.fersped.si

[30] http://www.frd.ro

[31] http://www.intereuropa.hr

[32] http://www.lima.sk

[33] http://www.maersk-logistics.pl

[34] http://www.mglogistics.com

[35] http://www.nemunobanga.com

[36] http://www.pol-rail.net

[37] http://www.rynart.nl

[38] http://www.tankerkomerc.hr

[39] http://www.tntlogistics.com

[40] http://www.transforwarding.com

[41] http://www.unimasters.com

[42] http://www.VIGOLIN.ee

[43] http://www.vojvodinasped.co.yu

[44] SOLE The international Society of logistics Available in: http://www.sole.org/

[45] XML- Extensible Mark- up Language Available in: http://www.w3.org/XML/

APPENDIX A
Source Code

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