TOWARDS A USABLE BUSINESS-TO-CONSUMER E-STORE: DEVELOPMENT OF AN INTEGRATED MODEL FOR E-COMMERCE TRANSACTIONS✧

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ABSTRACT

The emergence of new computer technologies and especially the Internet have changed the business world. Many electronic stores have appeared aiming to upgrade commercial factors such as promotion, advertisement, marketing, sales turnover and market share. In that context, it is easily conceivable that a new approach is needed for the design of business in the new electronic age. In this paper we present the main features of HELCOM (Hellenic ELectronic COMmerce), a project aiming to develop methods for creating successful electronic stores. We describe the main components of the proposed architecture, its functionality and the details of the e-commerce solution that the development team designed and implemented.

INTRODUCTION

As the Internet grows every day, the question that arises is the way purchasing will evolve in the future. The trend is that more and more users will access electronic stores for buying goods ([1]). An electronic store is not necessarily a substitute for the conventional store. In most cases, it works as a complement for a physical store and aims to gain consumers confidence. Since web business environment is evolving so rapidly that it is very difficult to identify the best business practices, the main issue here is to combine technical and business opportunities for designing and developing usable and effective electronic stores with minimum time, cost and human resources ([2], [3], [6]).

In this paper we describe the HELCOM approach for the successful design and development of online stores. This work is organized as follows; the next section presents the methodology followed; section III describes in brief the system architecture and the general platform developed to allow easy and straightforward implementation; section IV comprises conclusions and future plans.

HELCOM APPROACH

Our approach for designing usable electronic stores involves several discrete phases that e-commerce engineers should take proper care of, in order to achieve usability and effectiveness ([9], [10]). Lack of efficiency in any one of these phases can result in a general electronic store marketing failure.

The importance of the proposed approach can be certified in the sense that:

- It adapts with minimum technical effort in different types of stores.
- It easily expands to handle unexpected growth in merchandising.
- It successfully enables consumers to browse products and then order them directly from the online store 24 hours a day, 7 days a week.

The process begins with the identification of the content and the functional specifications, continues with the presentation design and the definition of navigation facilities and finally covers advanced user interface features and usability issues. Emphasis is placed on the essential characteristics and features that a usable electronic store should provide.

The first phase is to define the purpose and the target audience of the electronic store. The basic purpose of electronic store is to contribute to the transformation of web users/visitors to frequent cyber customers. The identification of the information content should be clear and specific. The store must determine and point out the proper information that the target audience will find most interesting. Also, the structuring and the correct organisation of the provided information have a great influence on the web site success.

The next phase is to decide about the provided functionalities. Within the context of an electronic shop this means significant facilities that increase users efficiency and satisfaction. Information and operations should be grouped and represented properly along successive web pages. Novice and expert user's support should also be taken under serious consideration.

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The presentation design phase should establish the electronic store's identity and give a clear overview of its content. The designers should follow presentation standards and guidelines ([5], [7], [8]) in order to take advantage of good practices and also increase the probability of user's satisfaction during the purchase process. The content should be presented in a natural way. The aim of a professional presence in the web is to guide and not to disorientate. The users must assimilate easily the store's behaviour. This means that some basic presentation rules should be adopted, such as: careful usage of colours, consistent sharing of graphics and text, proper selection of buttons and menus, correct placement of titles, text and images, appropriate choice of fonts and styles, unified and consistent format.

The navigation between pages is an important component for the success of an electronic store. If a user has trouble navigating from one page to another or cannot reach fast the desired information, he/she will choose a different electronic store to acquire the same item. Consumers need to find everything they look for quickly and easily. They should feel comfortable while navigating through pages or scrolling down a page.

The last phase refers to the observation of the customer behaviour. The electronic store adapts its presentation and functionalities to the identified user's profile. The customer preferences can be partly derived from his/her behaviour throughout his/her interaction within the store (e.g. sequence of webpages accessed). Sometimes for this reason, a special purpose questionnaire or a test is used in order to get a better view of the customer's purchase preferences.

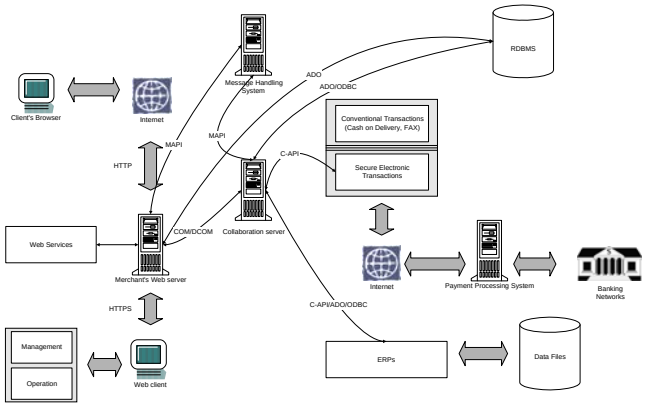
The achievement of usability is essential for any competitive electronic store ([4], [7], [8]). Usability focuses on the user interface of the store and refers to the elements that the user directly interacts with e.g. screens, menus, navigation controls. Furthermore, usability is a measure of how the electronic store has succeeded its goals. Fundamental user interface design principles can be applied at the degree which the electronic store lived up to its initial expectations, such as: learnability, memorability, simplicity, efficiency, consistency, user satisfaction and low error frequency ([5]).

ARCHITECTURE

In this section we shortly present the architecture of our solution. More specifically we define basic components and important concepts and describe the relationships among them. The key architectural ideas are to support a broad range of applications, to enable scaling of the system and to accommodate evolution in functionalities. Modular design plays an important role in the integration of the various internal and external system components with Helcom.store (the prototype electronic store we have developed). The system consists of the following main components:

- ***Helcom.store module:*** corresponds to the web interface for communication between both the shopper and the store manager with the merchant web server. More specifically, it is concerned with marketing and selling goods and services. Also, the module manages the details of the transactions, from placing the order to payment and fulfillment. Proper handling of the transactions is important, such as ensuring that the relevant information is delivered to the right places and that the payment is collected correctly.
- ***Electronic payment module:*** supports the process of online electronic payment. In its simplest form the module takes over from the merchant web server order form at the point when payment by credit card is appropriate. The payment gateway connects to a traditional financial network to authorize the transaction. Then the merchant computer stores the acknowledgment and sends a receipt to the shopper.
- ***Database module:*** information about shoppers, store and products being purchased are collected together in one place. Shopper information includes things like name, phone, shipping address, e-mail, means of payment, etc. Store information includes items such as payment methods accepted, means of fulfillment, etc. Product information includes items such as description, price, weight, taxability, etc. Also, this module allows the interconnection with the system servers.
- ***Mediate module:*** enables the interconnection with existent systems (e.g. ERPs, MIS, other enterprise financial and logistics systems).

Because of the general-purpose architecture we do not need to build the components again. We simply reuse and customize them in every specific case. The above modules have been developed using platform and tools of Microsoft. The system architecture is schematically presented in Figure 1.



Figures 1: System Arcitecture

Helcom.store is a leading edge, graphically elegant site and provides shoppers with a user-friendly shopping experience. The purchasing process is easy-to-use: the shopper simply chooses from an on-line catalogue, adds items to a basket and pays for the purchase total (which includes taxes and shipping costs) by credit card or by cash on delivery. Helcom.store sends a message (via e-mail) to the manager for fulfillment. Also, on-line registration gathers shopper information for marketing purposes (a shopper must be a registered member to purchase the contents of his/her

basket). Figure 2 shows an example of the Helcom.store home page.

Figures 2: Helcom.store Home Page

CONCLUSIONS AND FUTURE WORK

Designing and implementing an electronic store is a complicated job. Stores that want to have an effective web presence need guidance and information. The suggested HELCOM approach comes to meet these requirements and provide valuable knowledge about the best e-commerce practices. The key benefit of the approach is that it facilitates the development of different kinds of electronic stores. It also accommodates the needs of shoppers and stores so that everyone feels pleased and satisfied.

In this paper we have discussed the main issues of the proposed approach. The functionalities and the architecture of the Helcom.store were described. Guidelines that will be extremely useful for building a store were pointed. Finally, we can say that our main future direction is to phase a more systematic methodology that will facilitate and guide the design and the development phases of usable electronic shops. Obviously, there are many functional areas that need to be examined. As the Helcom.store continues to grow, internationalization of the site for local languages will be considered. New advanced features will be embedded in the architecture to enhance the value of store's offering to the users. Finally, one of our future plans is to investigate the business-to-business scenario.

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