

# Transforming Web Surfers to E-Shoppers

PC-HCI 2001 WORKSHOP



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## Workshop Proceedings

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## **Transforming Web Surfers to E-Shoppers**

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### *Impact of New Technologies on the Expansion of Electronic Commerce*

Goran Soldar, Brian Spencer, University of Brighton, and Dan Smith University of East Anglia

### *Scalable and interoperable e-commerce infrastructures: The Instant Commerce Server paradigm*

Dimitris Dadiotis, Dimitris Kalles, Eirini Ntoutsis, Athanassios Papagelis AHEAD Relationship Mediators S.A.

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Penelope, Markellou University of Patras

# Transforming Web Surfers to E-Shoppers

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## **Workshop Overview**

During the workshop five papers were presented. Goran Soldar, Brian Spencer and Dan Smith from the University of Brighton and the University of East Anglia, presented the Impact of New Technologies on the Expansion of Electronic Commerce. The paper examined the development of e-commerce in the context of the burgeoning of the WorldWide Web. The key web service technologies that have supported this development are reviewed and certain limitations of these technologies are discussed. The paper argues that, if e-commerce services are to continue their rapid expansion, the underlying technologies will need to change to provide greater flexibility, scalability and integration with enterprise systems. The paper described some recent developments in component technologies that have addressed these issues and proposes some guidelines for their exploitation

Dimitris Dadiotis, Dimitris Kalles, Eirini Ntoutsis, Athanassios Papangelis from AHEAD Relationship Mediators S.A, presented a Scalable and interoperable e-commerce infrastructure: The Instant Commerce Server. The paper asserted that to transform mainstream surfers to shoppers, we must focus on reinforcing a notion of widespread service and product availability addressing the subconscious fear that technology is for the select few. They presented key requirements that their infrastructure had to address and a commercial platform that satisfies them.

George Laskaridis, Costas Vassilakis, George Lepouras, Stathis Rouvas from University of Athens, raised the issue: “e-Citizens and e-Consumers: Is There a Difference?” They claimed that both the business sector and the government are nowadays embracing Internet technologies in order to provide high quality on-line services to their “target groups”. In both cases, service providers are trying to transform web surfers, casually visiting their web sites to seek information, to users of their electronic services, i.e. e-consumers and e-citizens. In the paper, they addressed the similarities and the differences between the business and the government, when they act as service providers, with respect to the factors for successful service and the issues that must be addressed.

Georgios Frigkas from Panteion University, Communication and Media Department, presented Internet Advertising as a key factor for transforming web surfers to e-shoppers. The role of rich media advertising. Advertising in the traditional media is considered as a tool for attracting the media audience to the physical place of a shop with the will to consume a certain product. On the other hand, in Internet, the medium and the shop are in the same “virtual place”. This creates both an opportunity and a challenge for advertisers. An opportunity because it's easier both to convince the audience to consume and to calculate the impact of an advertisement. A challenge because an advertiser has to invent new forms to communicate with the consumer, in a more direct, interactive and genuine way. Internet advertising nowadays is mostly

based on barely creative advertising forms. The point of the paper was to present the emergence of new advertising forms (rich media banners, interactive banners, games etc.) and analyse the advantages for both advertisers and consumers. As a conclusion, it was pointed that transforming web surfers to e-shoppers has not only to do with matters such as e-security, ease of use of a site etc., but as well with the adoption of a more flexible model of advertising that combines traditional advertising, promotional activities, direct marketing, use of rich media and public relations.

At the end Penelope Markellou from University of Patras, provided useful insight into a very important element of current eCommerce sites, the shopping cart. According to many studies a significant percentage of online shoppers abandon their shopping cart. Many reasons have been identified including limited functionalities, difficult navigation, poor user interface, etc. To this direction, the paper described a number of issues which are important to the efficient design of usable shopping carts. Bad and good shopping carts examples were also presented.

# Impact of New Technologies on the Expansion of Electronic Commerce

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## ABSTRACT

The paper examines the development of e-commerce in the context of the burgeoning of the WorldWide Web. The key web service technologies that have supported this development are reviewed and certain limitations of these technologies are discussed. The paper argues that, if e-commerce services are to continue their rapid expansion, the underlying technologies will need to change to provide greater flexibility, scalability and integration with enterprise systems. The paper describes some recent developments in component technologies that have addressed these issues and proposes some guidelines for their exploitation.

**KEYWORDS:** Electronic Commerce, Java Technologies, Web Services.

## INTRODUCTION

The number of Web users and Web pages continues its tremendous expansion. Kobayashi and Takeda report in [1] that it was estimated the number of Internet users would reach 377 million in 2000. The Internet is rapidly becoming an integral part of the traditional economy. The World Wide Web is now established as the infrastructure for the basic business model for many companies, with the prospect for even more strong growth. The traditional 3-tier architecture is underpinned by the new approach in extending web servers functionalities through Java Servlets as well as through data services features provided by Enterprise Java Beans EJB (Figure 1).

In the research commissioned by CISCO Systems and conducted by the University of Texas, the report of the Electronic Business for the period 2000-2005, states that US B2B will grow from \$336 billion in 2000 to \$6.3 trillion in 2005. [4] The Internet Economy has grown more rapidly than anyone could have envisioned even five years ago, opening up new vistas of communication, collaboration and coordination between consumers, businesses and trading partners. What started out as an alternative marketing channel has quickly turned into a complete economic system consisting of (i) ubiquitous, low cost communication networks using Internet technologies and standards, (ii) applications and human

capital that enable business to be conducted over this network infrastructure, (iii) interconnected electronic markets that operate over the network and applications infrastructure, (iv) producers and intermediaries providing a variety of digital products and services to facilitate market efficiency and liquidity, and (v) emerging policy and legal frameworks for conducting business over the Internet.

In this paper we take the position that the success of E-commerce is tightly related with the development of the Internet technologies, especially those based on platform independence. We analyze these technologies and argue how the latest advances in Java servlets and Enterprise Java Beans development should be employed in E-commerce systems.

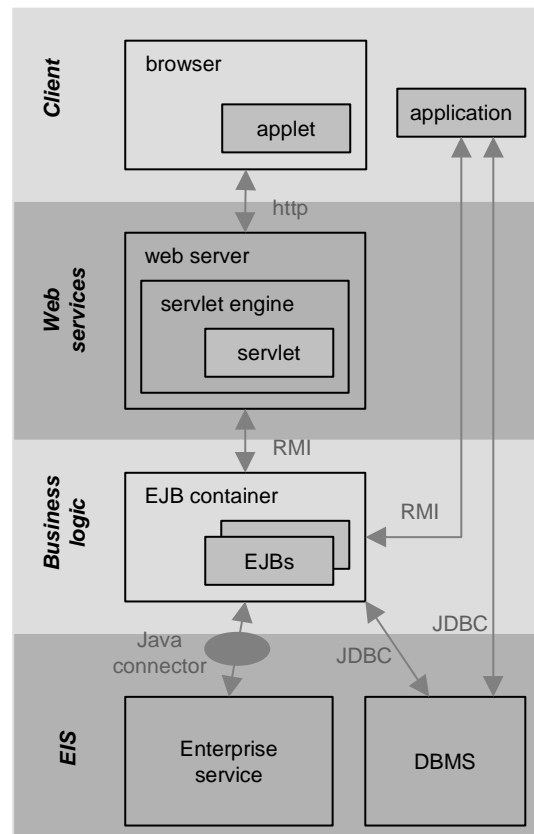


Figure 1 Multi-tier architecture

## WEB SERVICES FOR ELECTRONIC COMMERCE

Architecture for E-commerce broadly can be seen as Web Service and the Data Service layers. Web applications are the client side of distributed Internet applications. They include a collection of HTML, JSP pages managed by web servers with enhanced functionality provided by server side processing. The concept of web applications separates the user interface from data management. This separation allows

development of scalable dynamic transactions and interactive content to its clients. Due its flexible architecture, there is a different level of complexity in building such applications. This is determined by the components included in web applications. Figure 2 shows how E-commerce applications become more by increasing the number of web components built into the applications.

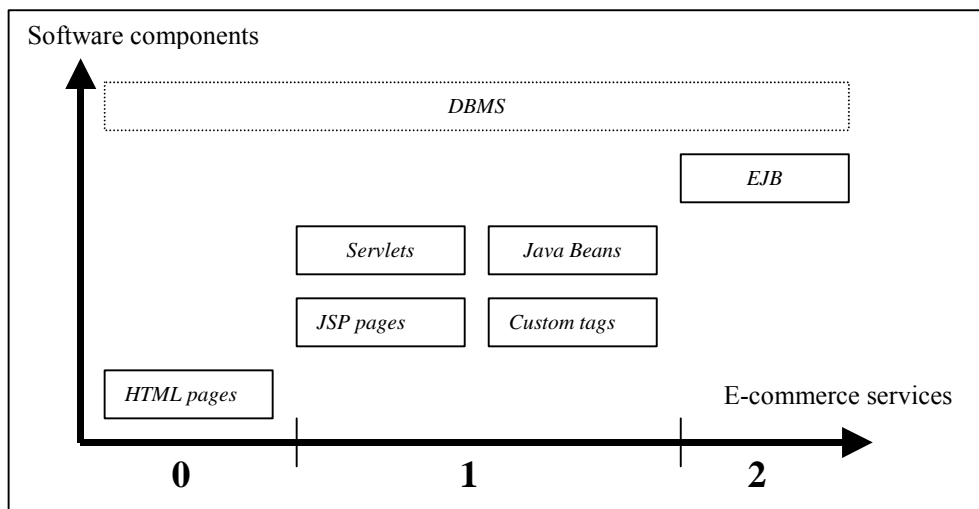


Figure 2: E-commerce complexity versus the number of software components

In its early days, the World Wide Web was able to offer only static web pages. E-commerce did not exist in a way that the business was conducted on-line. However this was the opportunity for businesses to market their products through professionally produced web pages that would attract interest from a wide population. The complexity of E-commerce at this stage is said to be 0 since there were only HTML created user interfaces and web servers that service requests for documents. With the development of Web technology the level of E-services increased in a way that processing was enabled at the server side, dynamic web pages were created and connection and interoperability with remote databases was established. CGI was the early solution to providing dynamic web pages. However it has a number of limitations. Its use depends on a particular web server implementation, i.e. they cannot run on other web server platforms. Their use in heterogeneous distributed applications is therefore limited. Also CGI scripts are difficult to maintain because it combines in one code module the content and the display logic. Java servlets, ASP, Java Beans, and JSPs were introduced. This is a period where real business on-line transactions began to take place. This level of E-commerce is known as Level 1. With the introduction of Enterprise Java Beans businesses are able to communicate with other previously incompatible sectors, and the potential is created for a new level of E-commerce (Level 2) where most complex and diverse transactions are executed. One

example of such business that clearly benefits from the advanced technology is the stock market. Until recently trading was done on asset-by-asset principle where individual stocks are sold and bought separately. The new technology has enabled Bundle trading which allows participants to trade assets in bundles or baskets in arbitrary proportions [2]. Investors can trade a bundle of assets simultaneously in a unified market instead of dealing with separate orders. In real life, an investor may need a bundle of resources that cannot be matched at all by any single seller. The bundle selling system automatically recombines resources from different sellers to satisfy the buyer's request for a specific bundle. Another example where the level of available technology plays a significant role in E-Business, is Supply Chain Coordination. Here a global supply chain is made up of a worldwide network of suppliers, manufacturing facilities, warehouses, distributed centers, and transportation systems [3]. Traditionally the distortion of information in the global supply chain has been a major obstacle in the process. Information with regard to supply and demand of products and resources is not readily available to the concerned agents, resulting in mismatches between demand and supply and inefficient usage of resources.

## DISTRIBUTED JAVA COMPONENTS TECHNOLOGIES

The notion of containers is central to the development of distributed applications by using Java Servlets and EJBs.

Containers are specialized run time environment for enabling component services. In general we can define two types of containers: Web containers and Data services containers. Web containers are oriented towards user interface and they control request-response relations between users and information management systems. Data service containers are responsible for management of data from information sources (structured and semi-structured) and also to enable effective communication and interoperability between other containers involved in a distributed system.

### Java Servlets

Java servlets are container managed web components, which are based on request/response communication. The servlet container is an extension of a web server that provides communication infrastructure between clients and web services. It can be built into a web server or as stand-alone extension to it. The communication that takes place between is as follows:

A client accesses a web server and makes an HTTP request.

The request is passed on to the servlet container which determines which service to invokes, and makes the call to the chosen servlet.

The servlet performs its task and generates response data to sent it back. It uses request and response objects to communicate with the client.

The container ensures that response was completed and returns control back to the web server.

A servlet is managed through a well-defined life cycle. It defines how it is loaded, instantiated and initialized, how to handle requests, when to terminate the service. The loading and instantiation can occur when the container is started, or delayed until the container determines that the servlet is needed to service a request. After loading the servlet class, the container instantiates it for use. Before the request is handled, the servlet is initialized to enable it to read persistent configuration data, initialize JDBC resources and other one-time activities. A container can send concurrent requests through the service method of the servlet. If a developer implements the `SingleThreadModel`, the container guarantees that there is only one request thread at a time in the service method. (The container may serialize requests on a servlet or maintain the pool of servlet instances).

### SERVLET CONTEXT

The Servlet Context defines the environment in which the servlet operates. It is placed at a known path within a web server. There is one instance object of the *Servlet Context* interface associated with each web application deployed into a container.

The request object encapsulates all information from the client request. (HTTP header and the message body). A servlet is able to extract parameters supplied by the browser. The response data is encapsulated into response object. This information is sent to the client either in the HTTP header of message body.

### SERVLET FILTERS

Filters are new features in Java Servlets version 2.3. Filters allow dynamic transformation of header and payload information in both requests and responses. It can transform the content of HTTP requests, responses, and header information. Filters do not generate response, or respond to requests. They modify requests and responses. Some of the functions of filter components are: authentication, Logging, image conversion, data compression, encryption, tokenizing, trigger resources access events, MIME-type chain, Caching. A filter is declared using the filter element in the deployment descriptor. They can be configured for invocation by defining *filter-mapping* elements in the deployment descriptor. Filters are mapped to a particular servlet by the servlet's logical name, or mapping to a group of servlets by mapping a filter to a URL pattern. When the web application is deployed, the container must locate the list of filters that must be applied to the web resources. When a container receives an incoming request, it takes the first filter instance in the list and calls its *doFilter* method, passing in the *ServletRequest* and *ServletResponse*, and a reference to the *FilterChain* object it will use. The *doFilter* method of a Filter is based on the following pattern:

Examines the request's header

It may wrap the request/response objects order in order to modify request/response headers or data.

It may invoke the next object in the filter chain. The container locates the next object to be invoked.

After invocation of the next filter in the chain, the filter may examine response headers.

When the last filter in the chain is invoked, the next object accessed is the target servlet or resource at the end of the chain.

A filter is defined in the deployment descriptor using the *filter* element. In this element there must be declared: *filter-name* to map filter to a servlet or URL, *filter-class* to identify the filter type, *init-params* to initialize parameters of a filter.

### ENTERPRISE JAVABEANS (EJB)

EJB is part of a family of technologies known as the Java 2 Platform, Enterprise Edition (J2EE™) The specification is available at [6]. EJB is an architectural

standard that defines how server-side components can be written and a contract between these components and the application servers in which they are deployed. This architecture is intended to promote a marketplace for reusable components. EJB is architected to allow the component developer to concentrate on the business-oriented functions of the components, without requiring extensive knowledge of middleware. Rather than demanding that the component developer writes code to interface to middleware APIs, EJB allows the components to exploit middleware services implicitly and transparently from an application server.

J2EE applications are inherently multi-tiered (at least at a logical level). There are at least four possible tiers:

The client tier allows the user to interact with the J2EE application. This tier can communicate directly with an EJB server or through an intermediate web server via HTTP or HTTPS. The web tier provides web-based services to clients using technologies such as servlets or Java Server Pages (JSPs) and can access other tiers through a variety of protocols. Among these protocols is Remote Method Invocation allowing access to the EJBs. The EJB tier provides access to the business logic encapsulated in EJBs. The EJB server contains the EJBs and provides a robust, scalable environment that manages issues such as transactions, persistence and security. The server, or the enterprise beans themselves can access other tiers through a range of methods. One such method is Java Database Connectivity (JDBC). The EIS (Enterprise Information Systems) tier provides access to databases, mainframe transaction processing monitors and other enterprise resources.

An enterprise bean is a component containing one or more Java object(s) that is deployable in a distributed object environment. The bean provides a single exposed interface to give access to its business functionality. There are two types of enterprise bean: session beans and entity beans. A session bean represents a business process. A stateless session bean provides its services through a single request. A stateful session bean provides processes that can last over several requests, "remembering" its state between these requests. Entity beans are used to represent persistent data, typically data that is stored in a database. The management of the persistence might be a function of the bean itself, or of the EJB server. An enterprise bean is single-threaded. Concurrent access from multiple clients is provided by the EJB server that will instantiate as many components as are required to deal with the concurrent access. Although this can be seen as a limitation of the architecture, the intention is again to simplify the work of the component developer by relieving the need to write thread-safe code.

EJB servers provide the environment in which enterprise beans can run. Although there are many EJB server products, providing a different set of features in each case; there are some common features listed here: Location transparency – the server makes an enterprise bean accessible from a remote location, without the client needing to know where the component is deployed or the details of the network that connects to it. Transactions – the EJB server manages a collection of distributed components interacting in an atomic "all-or-nothing" transaction. Life-cycle and state management – an EJB server manages the instantiation and re-use of components through instance pooling. It can even re-use a stateful bean by serializing the bean to persistent storage, allowing the bean to be allocated to a new client. Persistence – entity beans can have their internal state mapped to persistent storage and delegate the management of persistence to the container.

### COMPONENT SELECTION

Which of the Java components described in previous sections are employed in developing web based distributed E-commerce applications depends on the requirements of the system being developed. The following questions have to be answered before such a decision is made: 1) Does the system have *complex* business logic or is it based on servicing simple users' request, 2) Is the system likely to grow with respect to both number of clients on one side and the number of information sources on the other. As any of the components described above can be used, it is important to make a right decision. We compare the components with respect to the following criteria: 1) Development, 2) Deployment, 3) Service tiers, 4) Transaction management, 5) Scalability, 6) Costs of running.

### DEVELOPMENT

Java Server Pages (JSP) are easy to develop. They don't require programming skills, as they are presentation oriented and based on HTML. Enterprise Java beans require programming skills but to a moderate level. EJB are design to use for simple and specific tasks. For that reason they are not very difficult to implement. Java servlets require the highest programming skills as they usually contain the elements of business logic in smaller systems where EJBs are not used.

### DEPLOYMENT

Java components are container-managed and this property requires that they are deployed in their containers before they are run. The deployment descriptor, which is an XML file is used to describe and map components. Servlet elements such as filter are also specified in the descriptor. EJB's deployment is more complex due to complex nature of EJB server.

### SERVICE TIER

The services provided by components can be broadly divided into Web services and Data services. JSP and

Servlets are more tied to client and web server side whereas EJB belong to the data and transaction management tier. Furthermore, in conjunction with XML, EJB provides the architecture for a “wrapper” layer for existing legacy systems [5]. This enables the rapid web-enabling of such systems.

#### **TRANSACTION MANAGEMENT**

EJB container offers most robust transaction management facilities. It include the control whether the transaction successfully completed, as well as the control of concurrent execution of EJB instances. The servlet container is not aware of the transactions, so it is the programmer’s responsibility to ensure that servlets are executed successfully. As for the concurrency it can endure that if servlets are defined as *single-threaded* that they execute only one instance in a method. For the *multiple-threads* servlets, the programmer has to implement the concurrency control with the *synchronized* methods. JSP executed only as single processes and there is no concept of transaction associated with them.

#### **SCALABILITY**

EJB are designed to handle the increased workload better due its distributed nature and concurrency control mechanism of its container. Servlets and JSPs do not scale well as they are tied to single web server.

#### **COSTS OF RUNNING**

Running JSP only based systems does not incur high costs, as the development does not require strong programming skills. The hardware and software requirements are relatively low. Servlet based systems are more expensive to run, especially because high programming skills are required. The EJB systems usually are based on existing JSP and servlet technologies plus its own features added. That contributes to the highest costs associated with the development and running of such systems.

#### **CONCLUSION**

In this paper we analyze the effect of the Internet technologies on the development of Electronic Commerce. We separate Web Services from Data services in order to show that user orientated modules do not require substantial programming skills and experience. EJBs are introduced as components that allow E-commerce system to scale better and at the same time to simplify the task of dealing with distributed data management and integration of legacy systems. In this way, java servlets are left to deal with request/response communication and to perform relatively simple transactions (E-commerce complexity: 1).

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# Scalable and interoperable e-commerce infrastructures: The Instant Commerce Server paradigm

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## SUMMARY

This paper asserts that to transform mainstream surfers to shoppers, we must focus on reinforcing a notion of widespread service and product availability addressing the subconscious fear that technology is for the select few. We present key requirements that our infrastructure has to address and a commercial platform that satisfies them.

**KEYWORDS:** e-commerce, infrastructure, instant commerce, networks.

## INTRODUCTION

Why did the automobile become one of the most ubiquitous artefacts of the 20<sup>th</sup> century? Because it was low-cost when compared to trains, ships and airplanes and it served well the needs of an industrialised world to transport people and, especially, goods to the doorsteps of the public. Its success, however, sparked and was supported by a whole range of infrastructures: gasoline stations, roads, dealers, maintenance garages and insurance services (not to mention the traffic police and state regulations). And, all along, the automobile industry delivered faster, safer and cheaper cars.

So, pedestrians and goods became travelers, as communications transformed the way people perceived the world during the industrial era. This is, then, the analog with today's world, as we see it being transformed by information technology: if we want people to start moving their habits on-line, we should adopt technologies and policies that demonstrate this holistic, integrated view. Note that politicians already talk about such infrastructures in the context of information superhighways.

The key to a successful on-line shopping experience is to make people perceive that everything needed for such an experience is already there, seamless and transparent, from competitive prices to security and ease-of-use. This is a key human-computer interaction (HCI) challenge. This paper discusses how a new commercial platform, the Instant Commerce Server (ICS), fits into the quest to transform e-surfers to e-shoppers.

## INFRASTRUCTURES FACILITATE PERCEPTION

Before addressing the key ingredients of an e-commerce infrastructure, let us underline that at least one of these, bandwidth, is beyond the scope of HCI expertise. Besides the obvious consideration that bandwidth (or the lack of it) does significantly affect the perception of service quality, the ultimate decision to build bandwidth is taken at a level well beyond the priorities of shoppers and store owners.

Applications, however, present an excellent opportunity for reinforcing HCI research and practise, and it is here that we claim that the biggest impact is to be made. The key challenge of HCI for e-commerce success is to underline and project the **implicit** notion of widespread product and service availability; to successfully overcome human inhibitions on trust, security and feel of comfort when shopping. We strongly feel that this is an issue of sound architectural design [1].

## A shopper's point of view

Why will a surfer become a shopper? After all, a brick-and-mortar shopper has come to expect a standard service when dealing with conventional businesses. Can an on-line experience live up to these expectations or, hopefully, surpass them?

There are three major issues that an on-line shop must address, each of which may individually be a bottleneck towards acceptance, if left unattended.

**Pricing.** The ultimate drive towards most buying decisions is a better price. It is also, contrary to Internet layman logic, the most difficult to achieve - and sustain. Traditional distribution channels are optimised for one type of business or the other; direct sales or retail or some else. The Internet mode of delivery (as of yet) is the courier postal service; when added on top of the price of a piece of merchandise, the percentage of overhead varies greatly when delivering a book or a home cinema system. Judging from the most favourite items of on-line shoppers, it does turn out that people are happier to make small payments, for which postal cost can be a significant cost factor. If a consumer is not satisfied that a shop provides a reasonably priced products list, with

the option to compare market prices, the chances are that this consumer will remain a surfer for that site.

**Security.** In the off-line world, a consumer can usually look-and-feel the goods to be bought; she may return them and substitute them or claim her money back; she can enjoy the shopping experience with the added guarantee that she actually receives what she paid for; she can be quite safe that she will not have her credit cards details inappropriately used, etc. Of course not all of these are really true, but it is the perception that counts. Cryptography for on-line credit card clearance is now a commodity and suggests that, when professionally implemented, security will be much more robust than having sales people handle paper transaction slips. Legislation for product delivery will ensure that an on-line consumer can claim her rights and, either through legislation or through technology, one can ensure a smoother on-line experience.

The interaction and perception problem, however, is a vicious cycle. When adverse publicity hits the news, and many established traditional businesses have every motive to stress such events, people expect to see even more security and guaranteed performance in on-line shops compared to off-line ones, and still they will not buy. Site owners with few sales may then find it expensive to maintain immaculate sites and problems will surface; and the cycle goes on.

**Interest.** No matter how value-for-money or secure, a dull site will probably take a long time to become a success. Investing on nice storefronts, reviewing stock and offers, offering a variety of goods and affiliating with fellow merchants has always been a critical factor in gaining and retaining customers.

#### **A store's point of view: low cost is king**

The above key ingredients of consuming behaviour deeply affect how an on-line business is run. Each one of them taxes the financial and organisational resources of the business.

Added to the need to address the above consumer behaviour elements, an on-line shop owner needs to be able to set-up and maintain a store-front and the associated merchandise in a most efficient way. If we consider the currently fashionable shop-in-shop mechanisms, establishing an on-line presence within various instances of digital real estate (shopping in portals, shopping in community sites, multi-channel product presentations, etc.) is a task that may have to be performed on the scale of several times a month, dangerously taxing the resources of a maintenance team.

However, it is only through such blitz-attack presences and efficient implementation and support of affiliation and collaboration schemes, that the feeling of

everywhere, on-the-spot availability will be reinforced in the eyes of the public.

Traditional businesses have no motive to become Internet converts fast, unless an order-of-magnitude gain is there to be realised. Reality has also shown that, up-to-now, this gain has been realised by financial analysts (forecasters) and early technology developers. We shall now describe how these gains can be, at last, effectively shared by on-line shops, merchants and consumers.

#### **THE INSTANT COMMERCE SERVER**

Based on the above principles it should come as no surprise that we feel the shops to be the entities most responsible for attracting consumers to the Internet. We have therefore created a platform that can seamlessly and inexpensively assist WWW sites (or sites to be) and merchants to establish and manage a fully customisable on-line presence.

#### **Supporting on-line distributors**

Assume that you manage a WWW site that operates as the central point of a niche group of surfers, for example, amateur astronomers. The site manager has to deal with updating the members, the news, the content, and finds out that what has started as a fanzine is slowly growing and demands attention. How does one go about generating revenue to support the site's operation?

A fashionable advice, though catastrophic, would be to charge for content. Consuming digital content, however, is not a task that is yet perceived as worth paying for. A much more reasonable thought would be to decide to invest in a commercial venture, designating part of the site to act as a storefront that is full of items that amateur astronomers are known to be after.

Establishing this channel can be a win-win situation for many parties: the site owner who generates commission revenue, the merchandise owner who may not have even dreamt of selling through the Internet and the amateur astronomer who suddenly is able to buy through advertisements in the specialised (digital) press. Add to it the possibility of the astronomy site owner to fully customise the presentation of the advertised products and it turns out that the storefront of the site changes in an absolutely controllable way.

The key for these to happen is, however, the backbone. How can all the parties be confident that the business logic as well as the revenue distribution will be effective and efficient? The answer is that the Instant Commerce Server (ICS) is a platform that seamlessly integrates cryptography, click-tracking and secure user registration and payment clearance, allowing storefront owners and merchants to simply upload product descriptions and download product presentations. Providing, therefore, **all** the infrastructure required so that sites can be e-commerce enabled without **any** infrastructure

modification is the key innovation of ICS in the establishment of distribution channels.

### Supporting off-line merchants

If you have merchandise to sell, yet feel uncertain about what kind of an investment an Internet presence requires, what can you do? A key answer here is to be ready to accept that an Internet presence is an advertisement presence and that you should consider new options of advertising your products with an ad-enhancing feature: click-and-buy.

A TV or any traditional ad works by building and sustaining a sub-conscious information (over)load about a product, in the hope that, when at a shop, a consumer will remember the ad, associate with it and respond by buying. By enhancing an on-line advertisement with buying capacity, the message not only becomes clearer, it becomes intimate, direct and generates an eminent buy-now feeling.

Recognising this differentiation, ICS, as described above, provides all the infrastructure so that buy-now enhanced advertisements can be created (on-the-fly) for any products that a merchant intends to communicate. Again, the key infrastructure consideration to make is that the merchant need **not** have **any** infrastructure. This is in line with current findings that suggest that conventional businesses should be conservative in their IT investments [2] and concentrate on their labor-added value [3].

### Supporting mediators at-large

The on-line distributor and the off-line merchant are the two key strongly disjoint entities that benefit from the operation of the ICS platform. However, as in the off-line world, the transport of goods to a consumer gets a whole chain of service providers rolling, so, here too, we can identify some other players who benefit. Again, we cannot state too strongly that we feel scalability of a service to relate not only to computing capacity and efficiency but, also, and quite as importantly, to the ability to smoothly integrate the different players of the service value chain, efficiently and effectively. This is what we term as **user-perceived scalability**. Having said that, ICS treats technical scalability as *sine qua non* [4].

The first category is a mixture of the above: merchants going on-line can utilise the platform to create product descriptions and customised presentations, for their own use, without requiring to invest in infrastructure. Actually, the platform guarantees a smooth transition towards in-house infrastructure, should such a decision be taken.

The other category, ISPs, is a breed of the Internet itself. An ISP can utilise ICS as a backbone to develop packaged e-commerce solutions for its hosting clients at a very competitive rate. The key consideration here is

that existing and new sites can be effortlessly maintained through standard medium-level programming effort, while the transaction logic is seamlessly being handled by the ICS platform. This is also in line with the observation that application service provision (ASP) is emerging as the key outsourcing decision to be made in businesses moving on-line [5, 6].

One can now start enumerating features that the platform may already or should (at a later point) possess: profiling tools, cross-selling and cross-presentation tools, service hierarchies for merchants, customer relationship management targeted both at consumers and merchants and a battery of business enabling services that can be conceived and deployed when interested parties are able to establish network relationships. However, the fundamental structure does not need to change (see Figure 1 for the current architectural layers of ICS).

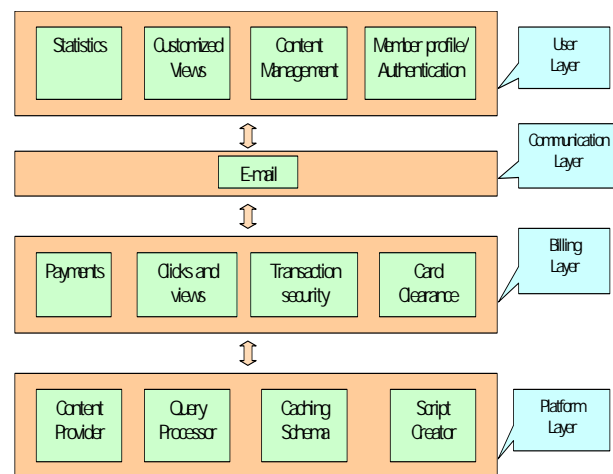
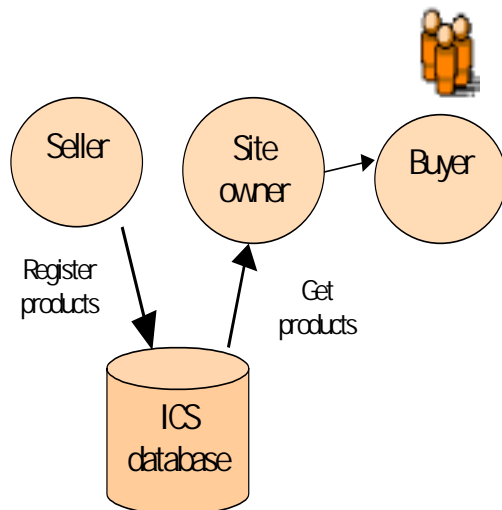


Figure 1: A coarse architecture of the ICS platform.

### The consumer's point of view

By providing minimal integration overhead requirements, the ICS platform promotes scalability and interoperability at a few "clicks" distance. This allows ICS-enabled sites to easily conform to emerging standards, should integration with marketplaces be required [7].

The consumer is, then, subjected to efficient presentation of secure buying features, with virtually unlimited product bundling and aesthetic freedom on the part of merchant sites. It is this ubiquity (see Figure 2 for a descriptive picture of how product descriptions are distributed through ICS) that sustains a feeling of a vibrant market, and it is a vibrant market that drives surfers to become shoppers.



**Figure 2:** Streamlining of product distributions.

## EPILOGUE

Supporting the supplier-consumer chain is what e-commerce is all about. Building tools that attempt to enforce a partial model of conducting business is not an option any longer. Integrated approaches that do not devalue existing infrastructure investments and can scale up on demand are definitely valuable and this paper has described an **existing commercial system** that adheres to these principles. The service is available at [www.icommerce.gr](http://www.icommerce.gr) and, at the time of writing this paper, the Instant Commerce Server platform is a globally unique solution.

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# e-Citizens and e-Consumers: Is There a Difference?

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## **SUMMARY**

Both the business sector and the government are nowadays embracing Internet technologies in order to provide high quality on-line services to their “target groups”. In both cases, service providers are trying to transform web surfers, casually visiting their web sites to seek information, to users of their electronic services, i.e. e-consumers and e-citizens. In this paper, we address the similarities and the differences between the business and the government, when they act as service providers, with respect to the factors for successful service and the issues that must be addressed.

**KEYWORDS** : e-services, .e-shops, citizens, consumers

## **INTRODUCTION**

Although the notions of electronic government and of electronic shopping seem very different at first glance, they actually share a lot of commonalities. For the electronic government the transformation of the casual web surfer to an electronic citizen, corresponds to that of transforming web surfers to e-shoppers. In the rest of the paper we investigate the differences between web surfers, business users, e-consumers and e-citizens, the factors concerning the development of successful electronic services as well as the differences and commonalities between business and government, under the role of electronic service provider. The paper concludes by identifying lessons and benefits that business and government may obtain from one another, with respect to the deployment of electronic services.

## **CITIZENS VS. CUSTOMERS**

In real life shoppers are usually citizens, in the sense that they may use a governmental service. The same is not necessarily true for e-citizens, since there is not a direct relation between e-citizens and e-customers. To illustrate the differences we provide a web user classification considering the level of interactivity of their Internet usage as well as the type of used services.

## **Non-Active Web Surfers**

Web surfers usually have a non-systematic presence in the web. They navigate in the Internet occasionally and most times they have no target for doing so. In most cases there is no certain topic of interest in the mind of those surfers when they initiate their navigation, and when there is one, most times they stray from it to other topics. They seek for a variety of information, focused in

their special interests and entertainment. Another characteristic of simple web surfers is that they prefer to leave no track of their presence, avoiding filling electronic forms with their personal data and e-mail in order to get some services or information. In many cases, such surfers barely have an e-mail account. The reason for this anonymity is the fear that personal data and e-mail can be used in undesired ways. Of course not all web surfers behave like this. It is a characteristic of new or immature surfers. Web surfers that are not afraid to enter personal data in electronic forms, we can state that they are one step away of being an active user of the web, namely an e-consumer or an e-citizen. This profile was composed by observing first year students and Internet seminar participants navigating in the Internet as well as users from Internet cafes.

## **Business Users**

Those are experienced computer users who use the Web almost exclusively for business. Usually they have no time for surfing, and e-shopping is not their task (neither traditional shopping usually). They leave tracks of their presence only in serious web sites and usually they can determine if a site is worth having some information by them – usually e-mail and other contact information. However, they consist an important target group for e-government services [2].

## **e-Customers**

E-customers are usually experienced Web users, feeling confident and secure to fill electronic forms with their personal data and providing their credit card number. They can be classified to a variety of subcategories. One such subcategory are e-shopping fans who shop on-line frequently, love the experience and encourage and others to do so. E-shopping searchers are the subcategory of Web users who use e-commerce sites to make a market investigation about a certain need, to compare features and prices so as to make up their mind about what they want to purchase without physical running from one store to another. These users may do their final purchase either through Internet either from the store. Finally, another subcategory is that of the cautious e-shoppers, who buy only from famous e-stores and stores of proved reliability.

## **e-Citizens**

E-citizens are considered to be the evolution of all the above users coming from all the above categories. Also a

considerable amount of e-citizens are new Internet users. Those users join the web only to take advantage of governmental e-services. Some times their expertise in using new technology is very small. This happens because such e-services concern nearly all citizens, so users can be derived from every education and income level. However, we can say that e-citizens, even if they are not experienced Web users, they feel confident filling personal data and sending them via Internet. Of course this confidence is established by the fact that at the other side of the transaction stands the government, which is assumed to be a confident partner. This profile was composed by observing the users of the new e-services of the General Secretariat for Information Systems of the Greek Ministry of Finance [4].

### **GOVERNMENT VS. BUSINESS**

Both government and businesses have been lately attracted to the provision of electronic services for a number of reasons. Government anticipates a means to alleviate bureaucracy and the enhancement of the service quality, while businesses aim to increase market shares and reduce costs.

### **Factors for Successful Services**

Whether we are addressing a G2C or a B2C services case, the provider of the services has to address a number of issues, in order to promote the acceptance and widespread of the electronic services, and minimise the risk of failure. These issues are outlined in the following paragraphs.

#### ***Establishment of Profile.***

One of the key issues in the success of an e-business is the establishment of a strong profile, in order to make the e-business accessible and trusted. More specifically:

1. Chances are the service users will go directly to a known Internet brand instead of searching for local, small e-businesses [1]. Search engines and service directories, although useful as an assistant to attracting public, are not an adequate means of customer attraction, since customers usually go to sites they know a priori, rather than searching for them. Thus, the lack of profile will lead to losing some potential customers.
2. Even in the case that some service users will finally visit the site, some of them will be reluctant in entering personal (e.g. address and phone number) and financial (e.g. credit card numbers) data to sites they do not completely trust. Intuitively, most users will trust more a well-known firm, rather than a service provider they have not come across before.

#### ***Experienced Personnel.***

Electronic services, in general, have increased requirements compared to traditional services for a number of reasons:

1. Services should be technically sound and their operation should be continuous and trouble-free. Dissatisfied service users will turn to alternative service providers (which are one click away!) or resort to the traditional service form.
2. The amount of interactivity with the service user is strongly limited to the information included in the web site offering the e-service. Thus e-service designers should foresee all the informational needs of service users and include the necessary information in the site.
3. Inevitably, some users will run into problems while using the e-services, either when using the service or while their request is being processed (e.g. when goods are packed and sent to the shoppers). Thus, besides the necessary on-line instructions and some tools for request status monitoring, which should complement the service, an efficient help desk offering support over the phone or via e-mail is required.

Due to this increased requirements, involvement of experienced personnel is a key factor to the success of electronic services. From IT staff to service designers and help desk operators, the workforce should be highly trained and qualified, in order to deliver services that will attract and uphold the service users.

#### ***Re-engineering of Services.***

All service providers have established some procedures to handle the "classical" line of work. The introduction of electronic services, however, cannot be done by simply mimicking existing procedures: procedure modifications and possibly organisational structure changes of the service provider may be called for, in order to enable the delivery of high-quality services [3]. Service re-engineering in all cases should target the minimisation of overall service delivery time and encompass the notion of "one stop shops", as opposed to isolated "service islands". The latter is especially critical for cases where servicing a single user request requires involvement of different departments or authorities.

#### ***Provision of Incentives.***

Electronic services have a strong competitor: the traditional service deployment channels, i.e. shops, bureaus, offices etc. With each of these two rivals having its pros and cons (cosy access through the Internet vs. personal experience with the merchandise, ease of access to third-party resources vs. detailed description by the shop's expert salesperson, facilitation of comparison between different e-shops vs. risks in security, enabling of access to remote services vs. the experience of visiting the shops), customers may need some additional motivation to shift from the traditional service deployment channels to their electronic counterparts. Special deductions and offers, priority handling of Internet-initiated transactions, or provision of extra services and tools may be some of the motivation offered

to customers, so that they would opt for the electronic version of the services.

#### **Personalised services.**

“Traditional” service channels include an implicit form of personalisation: visiting the appropriate department in a department store makes an initial selection of the goods one is interested in; personal relationships developed between sales persons and customers enable the former to know -more or less- what the latter prefer; and food delivery companies exploiting caller identification to know the address and the personal tastes of their customers, without the customers having to tell them. Electronic services have not only to level this degree of personalisation, but also surpass it. Assisted by the technological potential of IT systems, electronic services may formulate a highly personalised environment for service users. This may be done explicitly, with the user setting his preferences through suitable forms and supportive wizards, or even implicitly by tracking user behaviour within the system.

#### **DIFFERENCES AND COMMONALITIES**

Although government to citizen and business to customer electronic services share several common issues, there also exist some notable differences, which have to be taken into account. The required level of trust for the service is one of them. Admittedly, all services, either business or governmental, need to be secure and carried out through encrypted communication channels, while authentication schemes should assure each side about the identity of the other. However, transactions with the government rarely include direct transfer of money and, even if they do, this is not conducted in a manner that might be exploited by a malicious third party for its own profit, to the expense of the e-citizen. On the other hand, almost every business-to-customer e-service includes direct transfer of money to the business, which is exercised with more caution [5]. Consequently, governmental e-services have a clear advantage for penetrating the user community, while business e-services have a higher barrier to climb.

Users might be more eager to use governmental e-services than they would be for business services for a few more reasons. Firstly, visiting a shopping mall is usually considered a pleasant event, whereas very few citizens would think equally well of a visit to the local tax office. Secondly, e-government target group is usually secured, since the government is a monopoly for these services. There exists a single competitor, the traditional public administration bureau, instead of a vast number of multi-national or local companies offering the same goods. Thirdly, e-governmental services may offer a high added value to intermediaries, who undertake the fulfilment of citizens’ obligations to the government, thus user attraction policy might target these specific user groups. For instance, a service allowing accountants to submit electronically their clients’ tax declarations

might have a target group of a few hundred users, but besides being a valuable tool to them, the government has benefits equivalent to those of an e-business service attracting several thousands of e-shoppers!

However, within the process of delivering e-services, the government has to face some issues, which are generally not addressed in electronic business developments. The first major issue is that while e-business is allowed to focus on specific user groups, e-governmental services have to cater for all citizens: an electronic service that excludes some categories of citizens is clearly unacceptable. Another topic that has to be addressed is that many governmental services span horizontally across various public administration departments. In these cases a citizen-centric model has to be adopted, with all steps of service deployment, starting from the requirements collection and up to integration with the -usually diverse- back-end IT system and the administrative and support procedures are far more complex than one would expect for a service constrained in a single PA authority. Ideally, of course, the citizen-centric model would be adopted in all cases, but most e-government schemes nowadays do not use this approach.

#### **CONCLUSIONS**

Experience has shown that there exists a two-way relation between e-customers and e-citizens. Firstly, e-customers have the technical background and the tendency to quickly shift from traditional governmental service deployment channels to the electronic ones. Inversely, governmental e-services may prove an antechamber to electronic shops, since the former do not involve direct money transfers that hold back potential users; in this sense, governmental e-services may be the schools that prepare “netizens” with the appropriate culture, who will be less hesitant to visit the e-shops.

Moreover, both the government and business may learn from one another, as far as electronic service development is concerned. Electronic government should adopt a citizen-centric (or, even better, customer-centric) model, rather than the service-centric model usually employed in public administration bureaus. Flexibility and appropriate service reengineering have been two keys to success for electronic businesses up to now, and electronic government should take an example from this experience. On the other hand, e-businesses should take into account the fact that the major obstacle for transforming web surfers to e-customers is the flow of personal and financial data. While this is a giant step to take for the occasional web surfer, splitting it up in two smaller steps may prove catalytic. The first step would be offering some personalised or subscription-based services, in which personal data are required but no money transfers are involved. This will help users adopt the “netizen” culture, and thus take the second step -i.e. electronic payments- more easily. Another approach, which has proven successful within the

electronic submission of VAT declarations in the Greek Ministry of Finance, is the provision of a method to conduct payments asynchronously, via the banking system. Although this approach introduces administrative overheads and may induce additional costs (banks may require some commission), it will undoubtedly attract more customers to the e-shops, and then online purchases involving electronic payments will only be a matter of time.

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# Internet Advertising as a key factor for transforming web surfers to e-shoppers. The role of rich media advertising.

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## **SUMMARY**

Advertising in the traditional media is considered as a tool for attracting the media audience to the physical place of a shop with the will to consume a certain product. On the other hand, in Internet, the medium and the shop are in the same "virtual place". This creates both an opportunity and a challenge for advertisers. An opportunity because it's easier both to convince the audience to consume and to calculate the impact of an advertisement. A challenge because an advertiser has to invent new forms to communicate with the consumer, in a more direct, interactive and genuine way.

Internet advertising nowadays is mostly based on barely creative advertising forms. The point of this paper is to present the emergence of new advertising forms (rich media banners, interactive banners, games etc.) and analyse the advantages for both advertisers and consumers.

As a conclusion, I will point that transforming web surfers to e-shoppers has not only to do with matters such as e-security, ease of use of a site etc., but as well with the adoption of a more flexible model of advertising that combines traditional advertising, promotional activities, direct marketing, use of rich media and public relations.

**KEYWORDS:** Advertising, interactivity, rich media, banner, Greece, Internet, medium, direct marketing, public relations, e-commerce, interstitials.

## **INTRODUCTION**

E-commerce has been the buzzword among enterprises, users, researchers and Internet users for at least the last 3 years. There has been a serious discussion about the role of e-commerce in the global economy, the opportunities created for old and start-up companies, the rise and fall of dot-com pure play companies and the obstacles that prevent the full adoption of e-commerce as the main way of "doing business" [12].

The main goal of this presentation is on the one hand to demonstrate how Internet Advertising has a key role in this mutation from off-line to on-line consumption, especially with the use of new techniques such as rich media ads, and on the other hand justify the role of what is often considered as an intruding practice, that neither corresponds nor should be accepted in cyberspace. Finally I will make some propositions that emerge from my experience and research of the Greek Internet.

## **THE ROLE OF ADVERTISING**

Before analysing the role of advertising in modern economy, I should point out that in modern times and especially on Internet the term comprises not only TV commercials, banners, print ads etc. but other activities such as sales promotions, direct marketing, direct mail, organization of events and exhibitions, public relations [17]. A short definition of advertising is "every form of presentation and promotion of ideas, goods and services paid by a contractor" [8]. The main goals of advertising are to convince the consumer about the advantages of a product, inform about its existence and main characteristics, build an image of the product/service, create a positive image about it or change a negative opinion, differentiate the product from other similar ones and create a positive brand identity of the company that develops or sells the product or service [16].

Advertising needs a medium to reach the consumer. This may be a mass medium (TV, radio, press), an event (concert, exhibition, congress) or other forms (poster, lottery, games etc.). The latest mass medium that emerged in our society and is widely used by advertising is Internet. It is very important to note that Internet integrates all the promotional activities presented above (sales promotion, direct mail, commercials etc.) creating, thus, the need to approach advertising in a very different and systematic way.

## **ADVERTISING AND INTERNET**

When examining advertising on the Internet, one should be aware of its particularities. First of all an Internet

advertising campaign has to focus more on giving detailed information, answers to any possible question, possibilities to compare, after sales support and precise instructions to the web surfer. On other media, advertising very often does the opposite: it speaks to the subconscious, pays attention to the first impression and not to the detailed information and is more descriptive than analytical.

Some other characteristics that represent an advantage for Internet advertising is the low cost of production of an advertising campaign, the better targeting of consumer groups, the possibility to measure the precise impact of an advertisement, the interactive way of communication etc. This is why the pace of Internet advertising development has been very rapid.

In the following table we can see the advertising budget in the U.S. according to studies conducted by research companies. The figures are in million US \$ (for the year 2001 the numbers are predictions).

	1996	1997	1998	1999	2000	2001
<b>IDC</b>	260	550	1200	2000	3300	N/A
<b>Forrester</b>	N/A	500	1000	1750	4100	5600
<b>Cowles/Simba</b>	236	597	976	1580	2460	N/A
<b>Jupiter</b>	301	940	1900	3000	4400	5800
<b>IAB</b>	267	906	2000	N/A	N/A	N/A
<b>Yankee Group</b>	220	630	1200	1850	2200	3800

Table 1: Internet advertising budget in the US, prices in millions of US \$, source: e-marketer.

Those figures usually don't include the budget spent on direct marketing, public relations or Customer Relationship Management (CRM) activities, even though we cannot separate them from an advertising campaign.

On-line advertising is expected to represent 7% of the overall advertising activity by the year 2005. In Greece in 2000 it didn't exceed 600 million Greek Drachmae (0,1% of the overall advertising budget) and it is likely to rise up to 1,5 billion drachmae in 2001 [2][3]. The figure is small, but it is relative to the limited number of Greek Internet users and the low level of e-commerce development. Internet advertising is closely tied to the expansion of e-commerce. The first and largest ad spenders are dot-com companies, or e-shops. Thus, the relatively low acceptance of e-commerce in Greece is an obstacle for the development of Internet advertising and vice versa [3]. On the other hand the next few years an increased e-commerce spending is expected for the Greek consumer [11].

#### INTERNET ADVERTISING ENABLING E-SHOPPING

One important point that is often neglected when discussing the obstacles to the rapid expansion of e-commerce is Internet advertising and its role. Without

underestimating the importance of other factors like the security of transactions, the protection of crucial personal data etc. it should be stressed that the problems that are inherent to Internet advertising, such as the forms used, the adoption of commonly accepted web site metrics and the relatively low level of ad budget directed to Internet are at least equally important. In the following lines I will explain how Internet advertising and e-commerce interact, how the problems of each sector reflect on the other and how new forms of Internet advertising can enable the transformation of web surfers to e-shoppers. I will describe as well the present situation on this area in Greece and propose some of the actions that need to be adopted in this aspect.

It is commonly accepted that the history of the advertising industry is closely tied to that of the industrial and commercial sector in modern societies on the one hand and communication technologies and organizations on the other [13]. On Internet very often those sectors are interconnected in a new and complex way. Products, services, consumers and media reside in the so-called cyberspace. In that sense it is evident that the role of each sector (and foremost of advertising that we currently discuss) on Internet is equally important to the function of the system. Their development should occur in a symmetric and parallel way, especially because the interaction is so direct in the new medium.

The placement of on-line advertisement is probably the strongest element in this relation. Advertisers can approach a web surfer and present to him the appropriate advertising, at the appropriate moment, at the right web page. E-commerce sites don't have to wait for the surfer to come and choose. They can invite him when he is using a search engine and propose to him a product or service related to that search. This approach, thanks to new techniques such as rich media (analysed later in this essay), can be very subtle and polite, enabling the surfer to buy a product (or at least gather information about it) without leaving the site he is visiting.

Furthermore, at what concerns simple and easy to decide purchases, e.g. buying food, grocery, flowers, gifts etc., an interactive ad can become a fast and easy solution for surfers that are in a hurry; the surfer orders and pays in very few steps, without having to visit an e-shop. This direct connection between seeing an advertisement and completing a purchase is probably a crucial advantage when promoting e-commerce. In this sense, the development of Internet advertising (despite the problems that many companies of this sector face today due to the crisis of dot-com companies) will certainly contribute to a growing number of on-line sales.

#### FORMS OF INTERNET ADVERTISING

The first and most widely used web advertising form is the **banner**. A banner is "a rectangular ad appearing usually at the top of a web page" [14]. There are many

different kinds of banners (stamps, buttons, static, animated, html, interactive, rich media etc.) but they are all based in the same idea: present the advertising message in a limited space, in a way that can lead to clickthroughs to a web page with more details. However, there are many studies proving that banners as well contribute to creating a brand name and image [6], even though the limited space and file size (usually banners can't be of more than 14 K file size) do not permit impressive results on this aspect.

Another form often used is **text links**. Even though many underestimate the advertising value of a text link, it is certain that it is more than efficient. Given the fact that most of the users search the Internet with the help of search engines, an advertising text link appearing at the appropriate search string can lead to impressive results.

A form often used in print media, that successfully appears on the WWW is the **advertorial**. The impact of articles and editorials is much bigger than that of an advertisement, thanks to this sense of independence and objectivity consolidated in journalistic or scientific expression in a text. Advertising often uses the form of an editorial to promote ideas, services or products. In press it is always explicit when an editorial is an advertisement. On Internet it is not always like that, even though advertisers tend to respect this principle, in order to avoid negative reaction by web surfers.

There is as well a form that resembles a lot to TV commercial spots: the **interstitial** or pop-up or intermercial. This is usually a web page that pops-up when you view a site (or even when you close a web page, when you move your mouse over a certain part of the page etc.) It resembles TV advertising because it appears to the user unsolicited. Advertisers that are not much experienced to the web appreciate this technique, even though it can sometimes create negative feelings to web surfers, that don't like to be misled.

**Push technology** used to be a buzzword for advertisers. When it was first introduced, many considered it as the Eldorado. The technology consists on programs that actually push content to users (and within it advertising content) according to their interests and request, instead of waiting for the user to find the content for himself. After some years of push technology usage, it is pretty obvious that users have not embraced the concept, even though there exist some interesting applications (the most well known application in this field is PointCast. Of course, the idea of "pushed" content exists as well in e-mail advertising, but this is a topic will be discussed separately.

One should not forget that a great number of web sites are not created for commercial use. On the other hand those sites also need some kind of funding and at the

same time represent an interesting medium for advertisers. In this category we include universities, museums, sport clubs, organisations etc. that of course cannot host advertisements, but on the other hand can accept other forms of funding e.g. sponsorships or donations. Many companies find it useful and very effective to help those organisations, and get in return a mention in the site. Very often, the term **sponsoring** is inappropriately used for special advertising placing in commercial web sites (to define the ad space buying over a long period of time of a certain web page). This in my opinion does not correspond to the definition of sponsorship, but one should have in mind that it is widely used in this way.

Other forms of advertising that are used, but in a more sporadic and experimental way include the use of screensavers, bookmarks toolbars, cursors etc. Usually those forms represent a very small amount of the total ad spending but sometimes they can be very effective. But in some cases, it is possible that those models can develop quickly in the near future.

We should note at this point that Internet is not only the WWW, especially at what concerns advertising. Recent studies proved that **e-mail advertising** (e.g. advertising in discussion lists, newsletters, direct e-mail) is extremely efficient and cost effective. Many of the forms mentioned above are used in e-mails as well, such as banners and text links, but usually sponsorships and advertorials are preferred. The real strength of e-mail advertising is the fact that an advertiser can reach a highly targeted audience. Usually this audience is very interested in the e-mails it receives, so a correctly placed ad can have high response rate.

**Direct marketing** is a field that advertising companies used to neglect till the beginning of the nineties. The last decade, direct marketing activities turned out to be very popular and Internet is a medium that can prove to be the milestone for them. The creation of e-mail lists, the use of free samples (namely freeware or limited editions), coupons, the promotion of loyalty programs, the conduct of online contests and games are very successful, cheap and easy to launch on-line. Most importantly, direct marketing is a very powerful tool for succeeding web sales.

#### **THE USE OF RICH MEDIA**

To the forms mentioned above, one should include as a new form of advertising the so-called **rich media and interactive advertising**. Rich media advertising can be found as banners, interstitials, direct marketing activities or e-mails. The term rich media defines every ad that "incorporates video, audio and other technology components beyond simple animation" [15]. Those components of added value create a greater impact and interactive relations with the web surfer. In many cases, rich media link advertising with the act of shopping,

allowing for example the user to pick-up from within an advertisement a certain product and buy it.

There are many studies underlying the great impact of rich media advertising [5]. In this paper though, we are mostly interested in the integration of advertising to e-commerce and the ways that rich media advertising can help into transforming web surfers to e-shoppers.

In this aspect, there are many new techniques that create a direct connection between advertisement and e-commerce. The best example is banners that incorporate, apart from the advertising message, the possibility for the web surfer to choose from a list a certain product or service, be informed about it, check the price and then complete the transaction. This can be fulfilled in a secure environment of a web site, or even within the advertisement itself.

Maybe the best known example is an interactive banner for 1-800 Flowers that allowed customers to order Mother's day flowers directly through the banner. Within the banner, the users could specify separate billing and send-to addresses and include a message with their gift [1]. Another similar example is a banner created for Hewlett Packard's 720 series color printers. Web surfers were able to print product and discount information from directly within the banner ad [1].



Figure 1: Hewlett Packard's banner lets surfers print product info without leaving the web site they are visiting.

In the same category one should include **micro sites** that are usually interstitials, created to enable easy and fast processing of transactions for certain products/services. They are generated mostly by a mouse-click and give the web surfer the opportunity to shop, without leaving the site he is viewing (where the advertisement appears). A good example is an interstitial created for Honda. From the 12 million impressions, 60,000 on-line users provided their name and zip code, and of those 60,000, over 27,000 requested to be sent more information [1].

Interactive advertisements can be developed based on the use of many different technologies, but the ones that enable transactions are usually incorporating the Java programming language. Other technologies for creating rich media ads are Macromedia's Flash [20], Narrative Communication's Enliven [18], InterVU [19], Thinking Media's Active Ads [21] etc. Interactive ads can use as well HTML programming.



Figure 2: This Honda Interstitial attracted 60.000 web surfers to provide their name and zip code.

When discussing the adoption of rich media ads as part of the total Internet advertising market, one can easily assume that for the moment it represents only a small and unimportant part of total online ad expenditure. The Internet Advertising Bureau reports that rich media campaigns account only for about 2 percent of all online impressions bought. This situation seems to be changing in a rapid way [7].

One reason for the delay of a broader adoption of rich media ads is that only recently the IAB has issued guidelines for the acceptance of rich media. "These new rich media guidelines encourage adoption of interactivity within the ad units" [10]. In February media sellers' organization adopted more rich media-friendly creative sizes. So, it's highly possible that by the end of this year we 'll see a big shift from "traditional" online advertising forms to rich media ads [9].

#### RICH MEDIA IN GREECE

In the Greek Internet advertising market, there are very few examples of rich media ads use. The few that exist usually incorporate the use of some kind of animation e.g. the banner of Eurobank that recently appeared in all major Greek portals. The use of animation and sound are attractive elements integrated to this banner.

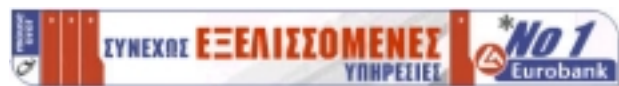


Figure 3: Eurobank's banners are rare examples of rich media advertising in the Greek Internet.

Recently Phaistos Networks released a media kit concerning the implementation of rich media banner at its portal Pathfinder.gr. On the other hand, there is only one example of interactive advertisement in Greece, as far as I know from my research of the Greek Cyberspace. It is the banner created by Izor.com (a Greek web developer enterprise) for the site DatingClub.gr. The users could perform a search within the banner for finding a companion, according to criteria such as gender, age etc. This banner used HTML, JavaScript, Flash and ASP technology. According to the

company the banner had a click through rate higher than 40% [4].

Research interviews that I have conducted the last year about Internet advertising in Greece show that executives from all sectors involved (e-commerce, advertising companies, Internet specialists, marketers) consider rich media advertising as a sector with great potentials of rapid development. But all of them mentioned that for the time being, due to the low bandwidth available on the Greek Internet, it is very difficult to see a wider use of rich media. The liberalization of the Greek Telecommunication market is very likely to accelerate this process, even though we cannot expect big steps forward for at least one year.

### CONCLUSION

The role of advertising in the process of commerce, as presented earlier herein, is thoroughly investigated and analysed by the scientific community. Internet advertising normally embeds this role for e-commerce, but at the same time contains some new important elements. At what concerns particularly e-commerce one should note two of them: Interactivity and the coexistence of both the advertising medium and the shopping place.

This fact creates new opportunities for companies and advertisers to directly connect advertising with consumption. It is much easier to convert web surfers to e-consumers than any other medium's spectators to consumers. As a conclusion, I should point that in any scientific research or marketing plan that tries to define the factors enabling the faster development of e-commerce by transforming web surfers to e-shoppers, Internet advertising cannot be left aside.

New techniques and forms of Internet advertising (in this paper described as rich media or Interactive ads) are going to further reinforce this ability to facilitate e-commerce in the next few years. Additionally, the incorporation of other forms of promotional activity, for instance Internet direct marketing or public relations in an advertising campaign will definitely generate even better results. One should expect that soon we would experience wider use of integrated online promotional activities aiming at providing more effective development of e-commerce projects.

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# Designing a Usable Shopping Cart

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## SUMMARY

This paper provides useful insight into a very important element of current eCommerce sites, the shopping cart. According to many studies a significant percentage of online shoppers abandon their shopping cart. Many reasons have been identified including limited functionalities, difficult navigation, poor user interface, etc. To this direction, the paper describes a number of issues, which are important to the efficient design of usable shopping carts. Bad and good shopping carts examples are also presented.

**KEYWORDS:** eCommerce, shopping cart, usability.

## INTRODUCTION

Nowadays, the notable trend is that the Web is increasingly integrated into consumers' normal daily activities. Buying online is considered significantly more convenient than other modes of shopping, at least for some product categories. Therefore, the challenge of establishing and maintaining *customer loyalty (e-loyalty)* becomes very important. An eCommerce site actualises its potential for convenience and time efficiency when it becomes *familiar*. Consumers indicate that their least favourite sites are those that fail to support a quick and easy shopping experience. Typically, these sites have repeatedly presented design problems.

One important element of almost all eCommerce sites is the *shopping cart*. The shopping cart is a useful *metaphor* that helps consumers use the site. A metaphor is a possible way to achieve a mapping between the computer system and some reference system known to the users in the real world [11]. For example, consider the task of selecting products from an online catalogue. The shopping cart is used as a metaphor to structure the interface and allow the users to utilize their existing knowledge about how to buy products. This is a very successful metaphor. For example, Amazon.com [1] uses the icon of figure 1 to visualise its shopping cart. The other example is from the Helcom.store [7] that uses two icons to indicate when the user's shopping cart is empty or includes products (figure 1). However, for inexperienced users not closely related to the eCommerce process an accompanying label would be necessary. The shopping cart metaphor directly indicates

to users the way to understand the basic functionalities. They can place products in the shopping cart, remove items or proceed to the checkout process.



**Figure 2:** Icons for shopping carts.

According to BizRate.com survey [3] 78% of online buyers abandon their shopping carts. From them, 55% abandon carts before they enter the checkout process. Another 32% abandon their carts at the point of sale (e.g. when they should fill in shipping and payment information). The key is the understanding of customer psychology, their needs, requirements and interests and how the site design can influence these factors [13].

Shoppers abandon their shopping carts for many reasons e.g. insufficient information, poor navigation, difficulty at handling, limited functionalities, confusing buttons or icons, time-consuming checkout process, low quality of user interface, etc. [7]. However, abandonment does not always indicate specific design problems. In many cases, it is driven by characteristics of how consumers shop online [5]. Moreover, items in a customer's shopping cart would be a measure of his interest even if he does not proceed their purchase.

From the above, it is straightforwardly considered that a well-designed shopping cart can facilitate the transaction and encourage consumers to buy more [14]. Contrary, poorly designed interface and functionality frustrate consumers and prevent them from successfully completing an online transaction.

The purpose of this paper is twofold. Firstly, the conceptual model and the basic functionalities of a usable shopping cart will be discussed. Secondly, case studies about bad and good practices will be presented, in order to be avoided or followed respectively in future implementations. Consequently, shopping carts that follow basic guidelines will have increased usability and

greater user satisfaction, leading to less cart abandonment.

### SHOPPING CART CONCEPTUAL MODEL

The term “shopping cart” refers to a single page on an eCommerce site that shows the items the customer has chosen to purchase. In many cases, similar metaphors like “shopping basket”, “shopping bag”, “shopping sled”, “wheelbarrow” are used. These *mental models* provide customers with a familiar and efficient way for shopping online [2]. An eCommerce site that does not use a similar metaphor may be converted to a learning experience, rather than a shopping one [8].

In a similar way to what happens in traditional supermarkets, online shoppers are given a repository to hold the product or products that they have selected to purchase. When visitors add items to their shopping cart, the system adds these items to a list so that later on they can retrieve the list and see it before they checkout, and also they can iterate through that list when constructing their final order. Consequently, the purposes of the shopping cart are to:

- ✓ show the items that the customer has already selected. Typical provided attributes are: item code, item name or short description, quantity, price, extra discount (if provided), availability, subtotal cost, shipping and other costs, total cost.
- ✓ provide information that the user wants to read before completing the purchase e.g. product description, shipping details, return policy, security policy, etc. Hyperlinking use can be very useful for the customers especially for the case of item description (return to the item detailed page).
- ✓ support operations for adding items, removing items, emptying shopping cart, comparing items, updating shopping cart and changing items’ quantities. Many eCommerce sites provide multiple add, remove or update buttons. This tactic is not recommended since it may be a point of confusion for the customer and unnecessarily increases the shopping cart functionality.
- ✓ offer mechanisms to customers to either continue the purchase (guiding them to the checkout process) or return to the store for more products (continue shopping), or search for another item (through the store search engine).

Figure 2 shows the state diagram for the shopping cart conceptual model.

The advantages from the use of shopping cart are significant: quick and easy shopping experience, familiar way of shopping, elimination of user confusion, clear step-by-step process, customer’s e-trust and e-loyalty, etc.

Finally, many eCommerce sites also use a simple form of the shopping cart, which is known as *persistent shopping cart* [4]. This cart is visible from every page of

the store and facilitates the shopping experience since it provides an easy and effective way to the customer in order to continually monitor the selected items and the total purchase cost.

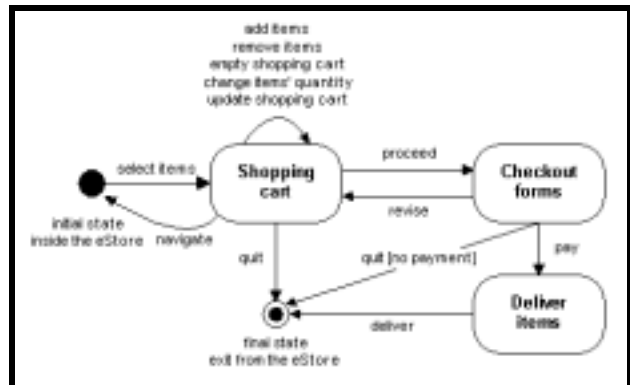


Figure 3: State diagram for the shopping cart conceptual model.

### CASE STUDIES OF BAD AND GOOD SHOPPING CART PRACTICES

The main goal of this study was to identify usability problems with specific bookstores’ shopping carts. Books and music CDs are products that consumers usually purchase online. Besides, the most known bookstore on the web is Amazon.com [1]. In Greece a number of eStores are available to consumers for buying books and music CDs. Papatotiriou and Ianos are two popular examples of bookstores available in the Greek electronic market.

Simple usability testing scenarios were performed. The following definition of “good shopping cart usability” was considered [10]:

- ✓ Users are able to add/delete items to their shopping cart.
- ✓ Users are required to make a minimum number of actions in order to proceed with their purchases.
- ✓ Users are allowed to have access on the contents of the shopping cart at any time.
- ✓ Users expect to be provided with a rich functionality shopping cart.

The testing results led to some interesting insights and recommendations about the specific shopping cart designs. Moreover, based on these results guidelines for designing usable shopping carts are developed. These guidelines are presented in the next section.

#### Papatotiriou.bookstore shopping cart

Papatotiriou bookstore [12] is one of the most reliable attempts in the area of eCommerce in Greece. It presents some similarities with the Amazon (uses the same shopping cart icon). It offers a big variety of book titles for online purchase. The store also provides information about best-sellers books, book reviews and other useful

information. However, this significant effort presents a poor shopping cart usability. Figure 3 depicts the shopping cart and its basic functionalities, which are:

- ✓ summary of the items the user has selected including information about book title, author(s), price, item id.
- ✓ links to book pages, so that the user can review them before purchasing.
- ✓ button for entering user's login and password (if he is a member of the store).
- ✓ button for registration (if he is a new member).
- ✓ button to remove all items.
- ✓ button for continuing the shopping inside the store.
- ✓ purchase total cost in drachmas.

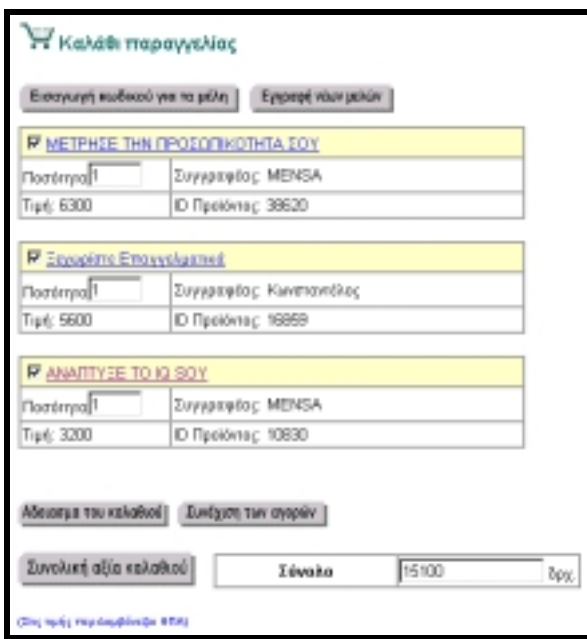


Figure 4: Papatotiriou electronic bookstore shopping cart.

In the Papatotiriou shopping cart a number of usability-related impediments were identified via the testing of shopping experience. These are:

- ✓ A way to remove one item every time is not provided.
- ✓ The navigation mechanism for sending the customer back to the store does not work in a satisfactory way (the destination point is quite unexpected).
- ✓ There are products that their price is not available so the total cost can not be calculated correctly.
- ✓ Shipping charges are not mentioned (in the home page there is a note that shipping charges = 0).
- ✓ “Update” button is not supported. In order to recalculate total cost, the user should press the “refresh” button of his browser.
- ✓ In many instances during the test, the “continue shopping” button did not go where the user expected.
- ✓ Euro currency is not supported.

- ✓ From the front page three items were selected. When the user wanted to go on his purchases an error was occurred.

#### Ianos bookstore shopping cart

The web site of Ianos bookstore and publishing house [9] is a well-built and easy-to-use online store. It offers a big variety of cd-roms and book-related issues such as new circulations, best sellers, awarded books, reviews, books of local writers, and news regarding books in general. The visitors of this site can also get gift proposals for books (books for kids, historical, literature, studies, etc.). The purchase procedure is straightforward and the small amount of information presented in each page limits confusion. The site supports an efficient shopping cart. Figure 4 shows the shopping cart and its basic functionalities.



Figure 5: Ianos electronic bookstore shopping cart.

The provided information in the shopping cart is well-organised and includes the following:

- ✓ Serial number of the selected item.
- ✓ Code of the selected item.
- ✓ Name of the selected item.
- ✓ Quantity of the selected item.
- ✓ Price of the selected item.
- ✓ Subtotal cost in drachmas.
- ✓ Subtotal cost in euro.
- ✓ Total cost in drachmas.
- ✓ Total cost in euro.
- ✓ Remove button.
- ✓ Continue button.
- ✓ Recalculate button.
- ✓ Cancel button.
- ✓ Return to bookstore link.

The interface design of the shopping cart is satisfactory and does not cover large area of the page in order to present the selected items and the appropriate information.

The testing identified few usability-related limitations to users imposed by the baseline shopping cart design:

- ✓ The shipping costs are not included in the total cost.
- ✓ Automatic clearing of the shopping cart is not supported.
- ✓ The items' titles should be links to the description pages.

## GUIDELINES FOR SHOPPING CART DESIGN

In this section, 20 guidelines for usable shopping cart design are recommended.

1. The shopping cart should be easy to find. The access should also be supported by multiple entry points e.g. the home page of the eStore, the products' pages, the search page, etc.
2. The information that the user should be able to see at once includes: item code, item description, quantity, item's current availability, price, shipping costs, other possible charges, subtotal, total cost.
3. A balancing presence of options is essential. Neither too many nor too few options. The options that the shopping cart should support are: add item, remove item, empty shopping cart, change item quantity, recalculate total cost, update shopping cart, continue shopping, checkout process.
4. Clear indication of all shipping costs, other additional charges, subtotals and total cost in order to establish a trustful and reliable relationship between the shopper and the eStore.
5. Support the returning to different parts of the eStore after adding an item to the shopping cart through easy navigation mechanisms.
6. Navigation buttons should clearly indicate where in the eStore they will take the shopper.
7. The buttons should state what they do from the user's point of view.
8. Avoidance of multiple add and update buttons. Their excessive use can cause usability problems to the users.
9. Every time the user clicks any button or link in the shopping cart, even if it is the "Help" button, the cart should update any changed quantities automatically.
10. An empty shopping cart should provide shopping instructions e.g. how to place items in the cart, how to recalculate the total cost, etc.
11. Information or links about the eStore's return policy, guarantees, privacy policy and security policy, should be supported.
12. Option for saving the contents of the shopping cart in a wish list or shopping list for future reference (some shopping carts support this capability for up to 90 days).
13. Provision of personal recommendations for related products could lead the customers to add more items in the shopping cart. Information from customer's past purchases (history) or his demographics could be used for producing accurate suggestions.
14. Provision for printing out shopping cart contents, and prices with the total cost.
15. Special care should be given to international customers.
16. Provision of a link to FAQ (frequently asked questions) or help pages. Addressing customers questions helps to establish trustworthiness.
17. Clear and informative error messages should be provided in order to enable users to resolve their

problems quickly. This way user's satisfaction towards the store increases.

18. A persistent view of the shopping cart in the top right of the pages could be very useful since the users look first at this area for a link.
19. Shopping cart should provide hyperlinks to the products' description pages for more information. In this way, users have the opportunity to review the selected items.
20. A visual indication about whether the shopping cart contains items e.g. by changing icon or colour, could help shoppers to remind them before browsing other pages or even other sites.

## CONCLUSIONS

Designing and implementing an effective shopping cart is not a complicated job. However, eStores that want to have an effective web presence need guidance and information. This paper provides valued knowledge about usability issues concerning shopping cart practices. The conceptual model of the shopping cart was introduced. Guidelines that will be extremely useful for designing a shopping cart were presented. Examples from the Greek reality (bad and good practices) were also mentioned.

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