E-COMMERCE CRITICAL DECISIONS

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1. INTRODUCTION

E-commerce is one of the most crucial issues in business today because it levels the playing field and lets small organizations compete with large. Experts argue that within five years there will be two types of businesses, those who are e-presented and those who are not.

E-commerce is the technology that gives the ability to market products and services and to conduct financial transactions electronically. As defined and used in this paper and inspired by Bollinger and Pfleeger (1990),[1], two entities are involved when developing an e-commerce site, the e-producer and the e-consumer. An e-producer designs and develops the components necessary for the development of the e-commerce infrastructure while an e-consumer is the one that owns the infrastrucrure and whose main activity is to access the repository of the clients' requests and to act in order to satisfy these requests with the most effective and efficient way.

An e-producer assumes that an e-consumer exists in order to:
- Perform some specific (and hopefully important) «jobs».
- Perform these jobs in a way which can be understood.
- Perform these jobs for the purpose of making and maximizing grofit.

Furthermore, an e-producer assumes that, to operate effectively, an e-consumer will organize its people and assign them specific tasks, resources, and responsibilities for ensuring that the important jobs are done and the institutional purposes fulfilled.

Many people today and more people tomorrow will use internet to purchase goods services before, if necessary checking out a brick-and-mortal store. To capture this audience an e-consumer needs a well-designed, functional and well-marketed e-commerce site that attracts customers and allows them safely and securely purchase what the e-shop has to offer. Both, e-producer and e-consumer, have to make sure that the web business is based on a solid foundation that covers every one of the following e-commerce critical elements presented in figure 1.

Choose and Register the Right Name

Site Requirements

Site Construction

Validation & Optimization

Host the site

Site Promotion

Figure 1. E-commerce development steps.

2. CHOOSE AND REGISTER THE RIGHT NAME

The very first requirement of an e-consumer is successfully choosing and registering the corporate website name; this involves carefully balancing several considerations. The e-store name is the core of e-consumer's internet identity and it must be unique.

2.1. Choose the Right Name

An e-commerce site must have a unique address in internet so that people are able to visit it. This unique address it is called web address of URL, or domain name and it is important that an e-shop has its own domain name, www.businessname.com, instead of listing the site as a subdirectory of a larger site. The most important reasons for an e-commerce site having its own domain name are the following [6]:

• Increases the degree of professionalism and credibility because it makes visitors feel that they are dealing with a large, established organization.

• Enables the creation of multiple email addresses of the form function@businessname.com allowing the definition of different email aliases to different functions within the organization.

A web name selection is both an artful process and a difficult task. The primary goal of an e-shop name is to communicate and reinforce the name of the actual business to every web site visitor; a good name can make the difference. Although most would agree that a good name should possess as many of the characteristics noted below as possible, however it is extremely difficult to find a name which possess all of them. A good name should be [6]:

• Short, simple and easy spell and read.

• Easy to recognize and remember.

• Pleasing when read and easy to pronounce.

• Pronounceable in only one way.

• Always timely (does ont get out of date).

• Adaptable to packaging or labeling requirements.

• Available for use (not in use by another firm).

• Pronounceable in all languages.

• Not offensive, obscene, or negative.

• A selling suggestion.

• Adaptable to any advertising medium.

• Free of odd spellings, slashes, hyphens or underscores.

A useful practice is the selection and registration of a number of the e-shop name's variations to make sure that these will be available if needed in the future or to make sure that the competition does not obtain similar names. E-commerce establishments most often register a name with a «.com» suffix, but at the same time also register their name with «.net» and «.org». Also, e-commerce establishments that plan to do business in other countries often also register country-specific web addresses, e.g. .gr for Greece, .uk for

United Kingdom. The selection and registration of a number of the e-shop name's variations based on the common misspellings factor will, also, ensure that any visitor, potential customer, who incorrectly types the web address still find his/her way to the site [15].

From the interim policy oversight committee document we quote «...one of the difficult problems in relation to domain names is the unauthorized registration, or «warehousing» of second-level domain names which correspond to existing intellectual property rights, for the purpose of trading off those rights or of selling those domain names to the owner of the intellectual property right. Litigation in national or regional courts does not provide a comprehensive solution to these problems because of the world-wide character of the use of domain names...» [4].

2.2. Register the Name

Once an e-consumer has decided on the name the next step is to examine if it is available and register it. The domain name registration authority for Greece is the Institute of computer Science of the Foundation for Research and Technology. Through its web site, www.hostmaster.gr, an e-consumer can accomplish the following:

• Search for the availability of a domain name by entering in the designated box the chosen name and then clicking «search».

• Apply for a domain name registration by filling an application form.

• Search for the owner of a domain name by clicking the «WebWhois» link.

The per year registration cost of a .gr domain name is 25.97 euro (including 18% VAT) and the initial registration fee has to be for a two year period, so the initial cost is 51,94 euro [2].

3. PLANNIG THE REQUIREMENTS

This phase has to come up with a well defined and understandable list of requirements. The final list must be given to the chosen e-producer for the design and construction of the site in order to take into consideration and satisfy every single item of the list. These items are organized into the three categories presented in figure 2:

Requirements' Categories
Content Accessibility
Quality Elements
Search Engine Design
Figure 2. Requirements'Categories

3.1. Content Accessibility

As the situation is in nowadays in the internet world a great number of people ar being excluded from surfing. These people suffer some kind of minor or major disability like color blindness, blindness, deafness or akinisia. For all these people the web experience is forbidden or very frustrating [5].

The e-store should be open to every one. To accomplish that, certain guidelines should be taken into consideration. These guidelines can be found in the W3C work under the name «Web Content Accessibility Guidelines» [19]. The following is a summary of the

directions given in that paper. Remember that the Accessibility issue can only be a motive for creating more sophisticated sites and not an excuse for developing ugly ones. An e-producer should make sure that:

1) The web iste information is fully conveyed either using text, auditory and/or graphics elements and that all graphics structures are understandable when viewed without color.

2) Stylesheets and not tables are being used to define the layout structure of pages. Tables should only be used in their simplest format and only to define tabular data formats.

3) Pages are accessible when certain features like sound, video or animation are turned off. Guideline 7 of the W3C institution emphasizes that «screen readers can not read moving text» and «people with physical disabilities might not move quickly and accurately enough to interact with moving objects» [19]. Blinks, flashes or flickers should be avoided.

4) A device-independent user interaction using any possible pointing and voice device is being defined and that turning off these features, the site still convey equivalent information.

5) The content, the relationships among the content and the navigation structures are easily understandable. The use of a short text and voice description for every visual construct is necessary.

Accessibility is not only important for legal and humanitarian purposes but also for financial reasons. If an e-producer designs and develops an e-commerce site without considering the disabled the e-consumer is losing thousands of potential customers.

3.2. Quality Elements

Consideration has to be taken concerning the following factors because these factors influence the quality of the site which in turn influence the link popularity and the directory entry [6].

1. The site's design should be such that to minimize the effort, time and clicks from the home page until the click to the actual purchase event.

2. The less visual structures the better as these affect the download time of a page which must be kept as short as possible. None of the site's page should take more than 6 seconds to load otherwise an e-consumer will lose customers and money.

3. Special attention has to be payed to the company's frontpage because it is the company's face to the world and the starting point of most user visits. The frontpage should.

• define clearly the identity and the purpose of the site including logo and slogan,

• help users find what they need,

• reveal site content through a search input box and a link to a site map.

4. The site should also include:

• A «what's new» section for news and announcements.

• The e-consumer's privacy statement that clearly describes the business's policy for protecting customer's information.

• Warranty and return policies.

• A Frequently Asked Question section that anticipates and answers customers' common issues.

3.3. Search Engine Design

An e-producer should develop an e-store that will be visible by as many potential customers as possible; this means that emphasis should be given to the fact that the e-store development phase should be also a search engine oriented procedure. There are search engines that index according to the keywords that appear in the meta tags while others place emphasis on the main ideas presented in the web page content - an e-store should be able to capture both behaviors. To accomplish that, the following requirements should be satisfied [6]:

Keyword Definition: For every page of the web site, keywords have to be chosen that are quite differenciated from the competition and best describe its goals. This is not an easy task as both e-producer and e-consumer have to be original and accurate.

Keywords Placement: the chosen keywords should appear:

• in the title tag that specifies the title of a document,

• in the description, keywords and content meta tags on all the web pages,

• in the images alt tags as the robots of some search engines index according to these keywords,

• frequently and gracefully in the content. However, attention should be payed to the fact that content keyword overuse leads to word stacking (index spamming) and probably to the removal of the web page from the index.

4. SITE CONSTRUCTION

There are different tools that give the ability to construct easily a web site with no in-depth XML knowledge necessary. These tools let choose from a variety of professional-quality templates with strong customization capabilities. However it is a demanding job and requires experience in e-development to construct a site that satisfies all the elements defined in sections 4.1, 4.2 and 4.3; this leads, inevitably, to the next phase which is the e-producer selection.

E-producers come with a wide variety of prices and abilities. At the following section we are presenting guidelines concerning the e-producer selection process [6]. These guidelines are structured around two set of questions. The first set of questions is addressed to the customers of an e-producer while the second set is addressed to the e-producer itself.

1. Customer Questions: A web developer should be able to provide a list with conatct information of happy customers. An e-consumer chooses some customers and discuss with them the issues of:

• Web developer's actual turn-around time.

• Web developer's responsiveness to requests.

• Pricing (development, maintenance and updates).

2. Web Developer Questions: There is no such a thing as a stupid question if an e-consumer is ready to take the business on line. An e-consumer should be prepared to discuss with a potential web developer the following issues:

• Continuous training and technical support.

• Accessibility issues experience.

• Maintenance plan.

• Custom Graphics capabilities.

- CGI library.
- Site promotion support with emphasis on search engine and directory registration.
- E-commerce development skills and experience.
- Fees and delivery time.
- Owenrship: When the project in finished, who will own the rights to the site and graphics?

5. VALIDATION AND OPTIMIZATION

This phase includes two steps, the code validation and optimization steps. Both steps have to be carried out by specialized tools to ensure their completeness. It is important to run this phase with the most rigorous way before the actual submittal of the site.

- Code Validation: the purpose of the code validation step is to find and repair bad code and broken links as that hurt the search engine rankings. Search engines score a page by looking for relevant terms in key HTML components in specific places within a document. If they don't find them because of typos, badly placed tags or broken links the spiders can downgrade the page or leave without reading the whole page. Problems with such errors can also affect directories because sites with broken links and errors are being penalized or rejected [3] [13].

- Page Optimization: The purpose of this step is to make sure that for every single page of the site developed, all the items specified in the requirements list, sections 4.1 & 4.2, have been satisfied improving the accessibility, compatibility, usability and efficiency of every page. It is important that this phase runs in parallel with the actual site development otherwise we may end up to high optimization costs [3].

6. FIND A PLACE FOR THE SITE

A site lives on a computer called web server connected to the internet. Any customer that wants to visit the site must connect to that server via the internet and view the files of the site.

Some prefer to have complete control on the server and make the appropriate investments on humanware, hardware and software while others, the vast majority, think that they are better off outsourcing the hosting to an Internet Service Provider (ISP) or web hosting company for a monthly fee. If an e-consumer is just starting out, have a large company host the web site letting him/her to concentrate on the business and not get bothered with technical issues. There are hundreds of ISPs and web hosting companies. What an e-consumer should know to make the right choice? A number of criteria should be taken into consideration in choosing the hosting organization for the e-commerce site [9] [18].

1. Technical support: Technical support should be available always, day and night for 365 days per year. Try to answer to the questions a) the number of technical support people and the kind of support they provide, b) the plans of the organization concerning the support team with emphasis on the audit and training plans, c) the number of companies they support d) speed and accuracy - test them by asking them questions and see how much effective and efficient their answers are!

2. Bandwidth: How much bandwidth - the number of gigabytes of data that can be delivered each month - on the average, is given to the site? If the iste is being successful and popular then a web hosting company should be ready to satisfy the request of increasing the site's bandwidth for a reasonable fee. What is the policy of the organization concerning hits, bandwidth and fee.

3. Peering: The company should own multiple high speed internet connections so that if one connection goes down the web site still gets delivered using one of the other lines.

4. Mirroring: A web hosting company should be able to offer the choice of creating a number of «mirrors» of the site on different servers at different locations. Mirrors increase speed and acts as backups. Peering together with Mirroring can ensure near 100 percent availability.

5. Security and Internet Payment: SSL stands for Secure Sockets Layer and it is a Netscape invention for securing the communication between a web site and the customer. It is a must that an e-consumer requests SSL. Once the communication has been secured the site should be able to support and accept all major credit and debit cards. The host infrastructure should be able to provide real time payment processing acting as an «Internet Payment Gateway» and managing the transfer of money between buyers, sellers and the financial institutions [14]. Many host companies provide this service through other organizations like Verisign, SECPay, PaymentOnline e.t.c..

6. CGI and E-commerce oftware: The hosting company should not only have a rich environment of Common Gateway Interface scripts but it should also allow to install (a CGI script resides on the web host's server) and run e-consumer's coustom CGI scripts. Yet, the web hosting company should provide a rich software library ready to be used with shopping cart software, merchant setup support, support for cybercash, shockwave, Real Audion, Real Video and other useful utilities.

7. Hosting Solutions: Ethnodata-Educational Department and the Marketing Academic Department conducted a research with the title «european hosting solutions». The research lasted three months and its goal was to record, compare, and make inferences on the different solutions provided. The group emk-01m that conducted the research asked information from 150 web hosting organizations and the following results provide a useful guideline framework of what an e-consumer should ask and expect from a web hosting organization [7].

The solutions proposed by the majority of the web hosting organizations are theree a) shared hosting, b) dedicated hosting, and c) Collocation. All three are explained in the following paragraphs.

7. Shared Hosting: Shared hosting is provided by all web hosting organizations and may be defined as the web hosting in which the service provider serves pages for multiple web sites, each having its own internet domain name, from a single web server [12]. Although shared hosting is a less expensive way for businesses to create a web presence, it is usually not sufficient for web sites with high traffic. These sites need a dedicated web server, either provided by a web hosting company or maintained in-house. Different companies provide different shared hosting solutions. The table in figure 3 summarizes these solutions [7].

Shared Hosting Solutions Comparison Table

Shared Hosting Solutions (SHS)	SHS 1	SHS 2	SHS 3	SHS 4	SHS 5
Pricing					
Monthly Charge	€ 20	€ 50	€ 75	€ 100	€ 300
One-time setup fee	€ 30	€ 40	€ 70	€ 100	€ 300
Technical Features					
Monthly Data Transfer (€ 05/MB over limit)	10 GB	30 GB	40 GB	50 GB	100 GB
Hard Disk Storage	200 MB	500 MB	750 MB	1 GB	10 GB
www.e-store.com	Yes	Yes	Yes	Yes	Yes
Daily Tape Backups	Yes	Yes	Yes	Yes	Yes
24 hours* 365 days	Yes	Yes	Yes	Yes	Yes
Technical Support					
Detailed Web Statistics	Yes	Yes	Yes	Yes	Yes
Access to raw log files	Yes	Yes	Yes	Yes	Yes
FTP access to your account	Yes	Yes	Yes	Yes	Yes
Virtual FTP server	Yes	Yes	Yes	Yes	Yes
Real Media Streams	No	No	3 free	6 free	15 free
Email Services					
Mailboxes	20	50	100	200	400
Email forwarding options	Yes	Yes	Yes	Yes	Yes
Email autorespondes	Yes	Yes	Yes	Yes	Yes
E-Commerce Capabilities					
SSL secure server	Free	Free	Free	Free	Free
CyberCash Support	No	Free	Free	Free	Free
CardService Support	No	No	Free	Free	Free

7. Dedicated Hosting: In the web hosting context, the concept of dedicated hosting is supported by the provision of dedicated servers by a web hosting organization. A dedicated server refers to the rental and exclusive use of a computer that includes a web server, related software, and connection to the Internet, housed in the Web hosting company's premises [12]. A dedicated server is usually needed for a web site (or set of related company sites) that may develop a considerable amount of traffic - for example, a site that must handle up to 30 million hits a day. The server can usually be configured and operated remotely from the client company. Web hosting companies clain that the use of a dedicated server on their premises saves router, internet connection, security system, and network administration costs. In renting a dedicated server, the client company may be required to use a specified computer system or may be offered a choice of several systems. Typically, a dedicated server is rented that provides a stated amount of memory, hard disk space, and bandwidth. Some hosting companies allow the renter of a dedicated server to do virtual

hosting, in turn renting services on the server to third parties for their web sites; domain name system, e-mail, and File Transfer Protocol (FTP) capabilities are typically included and some companies provide an easy-to-use control interface. Figure 4 summarizes the results of the emm-01m concerning the dedicated hosting solutions [7]:

Dedicated Hosting Solutions Features

Windows 2000 Dedicated Servers Solutions (WDSS)		Linux Dedicated Servers Solutions (LDSS)	
WDSS 1	WDSS 2	LDSS 1	LDSS 2
€150/month	€230/month	€130/month	€200/month
€150/setup	€230/setup	€130/setup	€200/setup
Usually AMD	Usually AMD	Usually AMD	Usually AMD Athlon
Athlon 1800 +	Athlon 2200 +	Athlon 1800 +	2200 +
512 MB RAM	1024 MB RAM	512 MB RAM	1024 MB RAM
60 GB IDE HD	120 GB IDE HD	60 GB IDE HD	120 GB IDE HD
500 GB Transfer	500 GB Transfer	500 GB Transfer	500 GB Transfer
Free E-commerce suite	Free E-commerce suite	Free E-commerce suite	Free E-commerce suite

7. Collocation: Shared and dedicated hosting solutions provide reliability and cost-effectiveness for standard web sites but organizations with large corporate or media rich sites and agencies that manage a large number of sites, often need to purchase their own server and communication equipment. Collocation results when an e-consumer's computer server and communication equipment are being installed at the host provider's location. The choice between collocated solution and managed-collocated solution is an important one. In principle the difference is control. A managed-collocated server is managed entirely by the web hosting organization on e-consumer's behalf fixing server's problems, making new software installations, etc. On the other hand, a collocated sever is fully controlled and managed entirely by the e-consumer. A managed-collocated solution is inevitably more expensive but it removes the hassle of managing the system; this solution is ideal where the server requires fewer changes and the e-consumer usually has large and heavy traffic corporate sites. A collocated solution is recommended for e-consumers that have the technical expertise to manage a server and need to make changes to the server on a regular basis [12].

7. SITE PROMOTION

Having completed all the previous phases, an e-consumer must now examine the final step of this e-commerce effort - the promotional activities. In this phase we are devoted to the definition and management of the promotional mix, that is, the most strategic combination of promotional techniques that will continuously and increasingly drive traffic to the site. An e-consumer should inform, persuade and remind target e-customers about the e-company and its e-solutions. We recommend the following [6]:

• The domain name should appear on all the printed distributed material like brochures, business card, letterheads, envelopes, bags and in the signature line of the e-store's emails [11].

• Web site submission to search engines. Following the directions given in this paper the web site constructed, is well prepared for search engines. The submission procedure is very easy: the web master fills out a form that tells search engines to visit and index the site. Submission should be made to all major search engines, since these engines will generate approximately 90% fo the web site traffic.

• Web site submission to the most important directories. In this case it is human editors, instead of search engine robots, that will review the site and accept or reject it depending on the site's quality. Before submitting we have to make sure that the site is absolutely running with no under construction parts and that before publishing it we have run the validation and optimization phase improving its quality [10].

• Link popularity: The term «link popularity» is defined as the total number of sites that are linked to an e-consumer's site - the quality and context of links are also taken into account. The number of search engines that rank by sites' link popularity increase. The following suggestions will help manage the link popularity - an e-consumer should ask from the web hosting company to provide the appropriate software programs.

1. Measure the site's link popularity and visit the pages linking to the e-store's URL.

2. Search for the pages linking to the competitors' domain.

3. Measure the URL popularity against other URLs of the same field.

These suggestions will give an e-consumer the appropriate information to understand the audience volume and quality of his site and competitors' sites. Ofren we should strategies to improve the reach and performance [8] [11].

• Quality articles and papers: Many people come to the internet looking for quality articles and papers - the site should provide them. This increases trustworthiness and credibility increasing the site's link popularity and the probability of having these visitors use the site's services.

• Newsletter: The goal is to provide a monthly newsletter with interesting and updated information. The ultimate goal is a) to remind everyone of the site's services, b) to ensure everyone the site's commitment to follow new concepts and ideas [17].

• Traditional advertising methods like ads in newspaper, magazines, TV, yellow pages, radiom. Some proposals are costly but effective [11].

• Newsgroups: An e-consumer should join discussions with topics related to the site's business and offer advice and information that directly and indirectly include the e-store's URL [11].

• Direct email: An organization should use this technique very carefully so that the communication is effective and not result to spam [11].

8. CONCLUSION

In Greece during the last 18 months we see a massive shift of companies towards e-commerce. A very important issue is the establishment of a consensus among the members of the groups involved about the critical steps that have to be faced in this e-commerce development process; not an easy task as this consensus, usually, results after a number of meetings and long discussions increasing frustration and the cost of the project. The main contribution of this paper is towards that direction, that is, to promote a better understanding of the problems involved and the alternative solutions dealing with them when moving to the e-commerce. Following and educating the groups involved in the e-development process in the procedure illustrated in this paper we can manage a) to form

knowledgeable e-consumers who support, guide and audit the work of e-producers, b) to improve the quality of existing sites, c) to improve sites' link popularity and directory entry, and d) to predict, control and often reduce e-commerce development cost.

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