E – BUSINESS WEBSITE DEVELOPMENT PROJECT

BUILDING AN IT EMPLOYMENT WEBSITE

MSc Project Background Report

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COMP60990 – Research Methods and Professional Skills

ABSTRACT

This report is conducted in order to set the foundations upon which the final project of my MSc in Advanced Computer Science and IT Management will be built. The title of the project is: "Website Development Project: Building an IT employment e-Business Website" and is supervised by Dr. Donal Flynn. The main target of this report is to conduct a thorough and in-depth analysis of the vast field of e-Business and at the same time explore the opportunities and the conditions that could lead into building a successful e-Business website on Information Technology employment.

The approach that was followed was to initially carry out a survey of relevant literature and related work on the broad spectrum of e-Business trying to examine not only the technical dimensions of the subject but also the business and the social ones. E-Business has a growing impact on our world and has revolutionized many aspects of human activity. Understanding its wider context is essential. The literature review tries to examine this impact and reach into useful conclusions as to where the project should focus on, in order to be successful. The success and failure factors of e-Business is another issue that is examined along with some cases of companies that managed to effectively implement e-Business in their operations and others that did not. Finally, there is a presentation and comparison of some well established website development methods. This comparison aims to show the advantages and disadvantages of these methods. This can be vital in order to exploit their strong points and avoid similar mistakes in the methodology that will be finally applied for the development of the website.

The second part of the report aims to present the methodology that will be followed throughout the project. The main objectives and goals of the project are described in this part, along with the project plan. Furthermore this part involves research on some key issues of the development methodology that was decided, like website evaluation, market research and business models suitable for e-Business.

Declaration

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1. INTRODUCTION

Technological achievements always had a great impact on every aspect of human society and affected our everyday life in a variety of ways. It is a technological breakthrough, that, over the last two decades, revolutionized our communication, entertainment and business methods and practices. Internet was created in the late 60s as a small network of computers and has evolved into the main and most essential link between companies, governments and individuals. Internet surpasses geographical boundaries, time limitations, cost restrictions. Furthermore, it is easily accessible by anyone. It is a low cost way for pioneering technologies, business models and ideas to reach a great number of people and provides the perfect environment for entrepreneurs.

With Internet's popularity on the rise, it became clear that the business world could not overlook this phenomenon. According to *Chaffey (2002)* companies need to find a way to implement all these new electronic ways of communication and transaction into their traditional business procedures. An industry that has been transformed by Web technologies is the employment industry. Information and Communication technologies have transformed the traditional methods and practices applied in the employment sector. Online applications, online psychometric tests, huge databases of candidates and vacancies, online communication, are some of the most important changes that Internet has introduced in the employment field.

The reasons that led to the huge development of the Internet as a mean to assist in job search, are highly related with its nature. It provides a very cheap way for companies to recruit candidates and usually a totally free way for candidates to search for suitable vacancies (*Kuhn and Skuterud,2004; Stevenson, 2008*). Moreover, Internet services "*offer firms and workers the promise of instant access to a much larger number of possible matches than traditional channels, as well as the potential for the exchange of much more detailed information about both worker and job attributes*" (*Kuhn and Skuterud, 2004*). This huge amount of information that can be easily accessed is the key to the success of employment websites. According to a survey on the internet usage, 75% of the job get job information through the internet rather than using other more traditional methods, like connections and newspapers. (*KISA, 2010*)

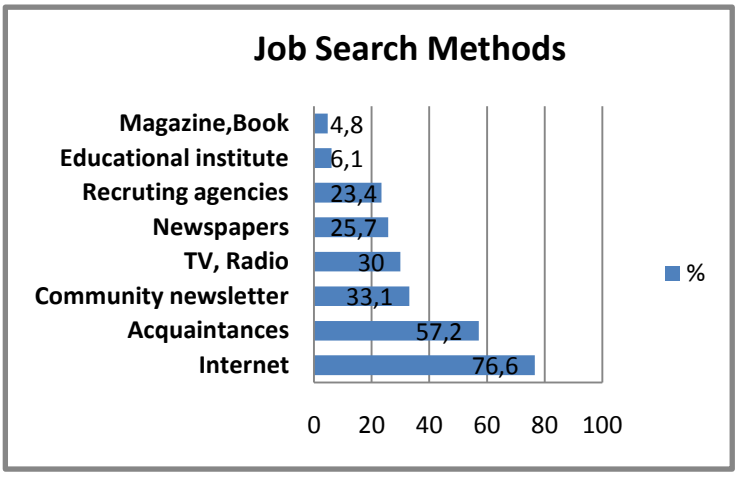

Figure 1: Job search methods (*Source: KISA,2010*)

1.1. Definition of E-Business

This turn towards Internet based technologies generated a new status quo in the business world. E-business was defined by IBM back in 1997, as "*the transformation of key business processes through the use of Internet technologies*". According to *Chaffey (2002)*, e-business is described as "*all the electronically mediated information exchanges, both within an organization and with external stakeholders, supporting the range of business processes*." *Boone and Ganeshan (2007)* define e-Business technologies as "*the use of Internet or any digitally enabled inter- or intra- organizational information technology to accomplish business processes*". Finally, *Damanpour (2001)* provides a similar definition."*E-Business is any "net" business activity that transforms internal and external relationships to create value and exploit market opportunities driven by new rules of the connected economy*".

1.2. Short History of E-Business

Despite the fact that e-business is a relatively new trend in the business sector, its brief history is filled with controversial events. The rapid growth of the popularity of the Web from 1995 was accompanied by a highly profitable period for e-business companies. Setting up a fully functional e-Business website was very easy and cost efficient and at that time it was thought to guarantee success and profits (*O'Connor and Galvin, 1998; Janenko,2003)*. The number of e-businesses kept growing in an attempt for everybody to have a share from the profit pie. On the turn of the century, their number reached its peak and their profit opportunities and potential financial growth was capped. This led to the huge stock market collapse of many e-business companies which is known as dot.com bust. After a five year period where companies had to reevaluate their strategic approach towards e-commerce, growth of e-businesses started to increase again, reaching double digit level through the current period.

1.3. Scope and Focus of the Report

The explosive growth of the e-Business over the last two decades, has captured the attention of many researchers and academics from various scientific fields. Recognizing the diversity of the nature of an e-Business, which complies with the diverse nature of the Internet, this report tries to examine the topic from a variety of viewing angles. According to *Laudon and Traver (2007, p.38)*, e-Business follows the same pattern as any previous technology driven revolution. "*Technologies develop first and then these technologies are exploited commercially. Once commercial exploitation of these technologies becomes widespread, a host of social, cultural and political issues arise*."

Although the main goal of the project is to create an e-Business for IT employment, the background report's goal is to examine the whole idea of e-Business in depth and look at different issues that arise. It does not focus on examining the technical and development side of building an e-Business website. Furthermore it does not focus on literature work that deals solely with employment e-Businesses. The reason that this approach was followed, is that the general rules and the theoretical background that define the framework upon which, an e-Business is built, are the same, despite the fact that the idea behind each e-Business may differ. The report tries to analyze the methods and the strategies that lead to a successful e-Business and the reasons behind this success. Examining the topic of e-Business as a whole, could lead to more secure conclusions, regarding the characteristics of a successful employment e-Business.

2. LITERATURE REVIEW

2.1. Information is Power

This is one of the most widely accepted statements and applies for every aspect of human activity. Internet is an unlimited pool of information and benefits anyone who uses it properly.

According to *Porter and Millar (1985)* information gives competitive advantage to a company in three different ways:

a) By changing industry structure and changing the rules of competition.
b) By providing companies with new ways to outperform their competitors.
c) By creating new businesses, even from within a company's existing operations.

The authors continue by discussing the strategic significance that Information Technology has obtained for companies, by affecting the value chain, thus the technological and economic activities that a company performs to do business. Not only it transforms the value chain, but also transforms the product or the service that the company produces. Additionally, authors suggest five ways for Information Technology to be successfully implemented in business processes. This can be done by:

a) assessing the intensity of information
b) determining the role that Information Technology will have in the industry structure
c) understanding the ways that it can create competitive advantage for their companies
d) investigating the possibilities of new businesses
e) developing a strategic plan to take advantage of Information Technology.

In their work *Porter and Millar (1985)* relate the advantages of Information Technology with the ability it provides to a company to gain and sustain competitive advantage, one of the main goals of every business. However, one key characteristic that they do not thoroughly refer to, is innovation. It is in the nature of these technologies to allow entrepreneurship and innovative ideas to prosper. Innovation is capable of changing the structure of the industry, creating new businesses and providing new revolutionary methods to companies in order to beat the competition. So it is another way to gain competitive advantage through Information Technologies and especially through e-Business. For this reason, this project gives emphasis on investigating possible gaps in the IT employment field and presenting an innovative idea to the market, which would allow the final e-Business product to have competitive advantage.

The value and the power of Information is also highlighted in the work of *Evans and Wurster (1997)*. They mention that there are two basic characteristics of Information, which when combined with disruptive Internet technologies, can have a major impact on a marketplace. These characteristics are Richness and Reach. As briefly defined by *Evans and Wurster (2000)*, "*Richness means the quality of information, as defined by the user. Reach is defined simply as the number of people who participate in the sharing of that information*". Their main conclusion is that "*a basic law governs the economics of information and restricts their value creation potential. This law states that there is a universal trade-off between richness and reach*". This means that the richer the information we want to communicate the smaller the number of people we can send the information to. " *This pervasive trade-off has shaped how companies communicate, collaborate and conduct transactions internally and with customers, suppliers and distributors*". *(Evans and Wurster, 2000)*

However, the emergence and explosive growth of disruptive technologies, that have completely revolutionized the traditional standards in communication, tend to eliminate this trade-off. Internet deconstructs the old channels, through which rich information was transferred only to a limited audience. Now everybody can communicate and share rich-content information with everybody else. *Evans and Wurster (1997)* mention that this creates a *hyperarchy*, which "[…] *challenges all markets with the possibility that far richer information can be exchanged*". This hyperarchy is presented by the authors through a set of examples regarding the news industry and retail banking companies, which indicate that the new status threatens some established businesses, but at the same time creates many new opportunities.

2.2. Impact of e-Business on Traditional Markets

As any other disruptive technology e-Business has affected financial markets in a variety of ways. An important characteristic that *Bev (2008)* examines is Disintermediation, which refers to the non-existence of intermediaries in a supply chain. Internet allows full disintermediation because of the market's transparency. Disintermediation is also examined by *Evans and Wurster (2000)*. According to their work, the new form of disintermediation that was developed along with the Information Technology, "*allows for the traditional richness/reach curve to be displaced, allowing new players to offer greater reach and greater richness simultaneously*". E-Businesses are created, which aim to play exactly the role of the intermediate between the manufacturers and the customers. This is called reintermediation.

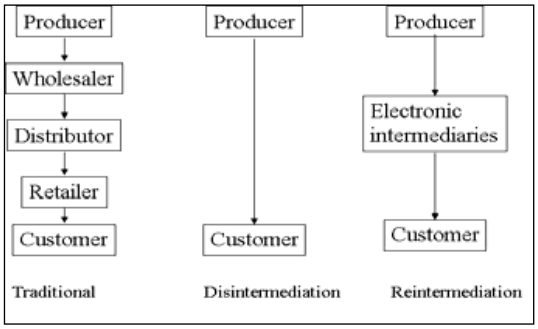

Figure 2. Disintermediation/Reintermediation
(Source: Saini et al., 2009)

In his conclusion, *Bev (2008)* mentions some of the advantages and the disadvantages of disintermediated channels. The main advantages are reduction to search costs, price dispersion, price transparency and price differentiation. Another thing to consider is some important disadvantages of disintermediated channels. Although *Bev (2008)* slightly mentions some of them, a more careful and thorough research should point out that one of the most important challenges of these channels, is to create a safe business transactional environment. Being the intermediate between the producer and the customer involves many security risks, which should be thought of in depth, before building an e-Business.

The above mentioned research proves that there is the appropriate ground in digital markets for an e-Business that would act as an intermediate between companies offering IT jobs and people who are interested in those jobs. Also the above mentioned literature, points out another objective of the project. The final e-Business product should be rich in information content and also should reach as many people as possible, since this could guarantee its success.

2.3. Success and Failure factors of E-Business

According to *Damanpour (2001) "E-business and E-service will move to the forefront of technology priorities. To take full advantage of the E-service, you need to look at your organization from an alternative perspective. The question is how to deal with these changes, at what cost, and at what speed. This is not the time to worry about "disintermediation". It is the time for cooperation, integration, and the consideration of customer loyalty, profitability and competition advantage."*

As we have seen, e-Business has noticed remarkable growth and success over the last years. Despite the numerous examples of successful e-Businesses there are many examples where e-Business failed to succeed. By looking at those characteristic examples, this report tries to understand the factors that lead to a successful e-Business but also to figure out the dangers that may lead to failure. These factors would form a helpful guideline, which would help in making the IT employment website as successful as possible.

2.3.1. Success factors and examples

Amit and Zott (2001), examine the factors that lead to value creation in e-Business. They argue that no single theoretical model or management theory is adequate to describe the value creation potential of e-Businesses. In order to prove this point, they examine and compare well established theories and business models, like the value chain framework of Porter, Shumpeter's theory of creative destruction, the resource based view of a company, the strategic network theory and transaction costs economics.

The authors examined the value creation sources of 59 e-Business firms. Through the analysis of data from these companies, which were used as case studies, *Amit and Zott (2001)* conclude on four sources of value creation, "*four primary and interrelated value drivers of e-Business: efficiency, novelty, lock-in and complementarities*". These are vital qualities, that each e-Business should possess and so they can be used as criteria for comparing different e-Business firms.

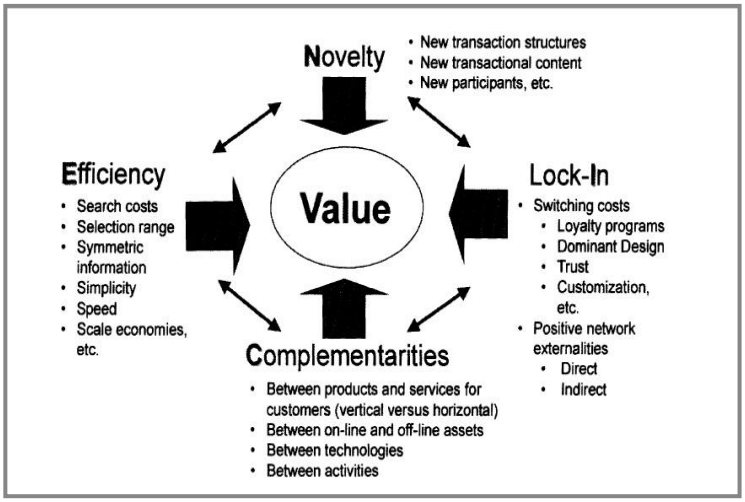

Figure 3. Value Drivers *(Source: Amit and Zott, 2001)*

Amit and Zott (2001), describe as *efficiency*, the reduction in information asymmetries between buyers and sellers, the speed with which information can be transmitted over the Internet, the reduction in customers' search costs, the reduction in distribution costs, the faster and improved decision making and the faster and easier methods of transactions.

Amit and Zott (2001), show through their analysis that novelty is also a value driver, in terms of introducing new products or services, new methods of production, distribution or marketing.

Lock-in is essential in electronic markets. Every e-Business must have a well-defined strategy to increase the loyalty of its customers. Especially in e-Business, competition is one click away, which indicates the importance of lock-in, "*The value-creating potential of an e-business is enhanced by the extent to which customers are motivated to engage in repeat transactions and by the extent to which strategic partners have incentives to maintain and improve their associations.*" *(Amit and Zott, 2001).*

"*Complementarities are present whenever having a bundle of goods together provides more value than the total value of having each of the goods separately".(Amit and Zott, 2001).*

This model of Amit and Zott (2001) sets the basic theoretical framework and provides an excellent guideline to understand the attributes of a successful and profitable e-Business. On the other hand, there is another very important source of value creation for e-Business, that this research paper has not examined thoroughly. Human-computer interaction criteria are not examined. However, they are a major reason for value creation, especially as the technology develops. User-friendliness, content and security are some of the most important features of a website, that their value creation potential should be examined in more detail.

Damanpour (2001) presents some of the main factors of success for an e-Business. These are execution and demand fulfillment, collaboration, flexibility and speed. *Damanpour (2001)* states that "*to achieve the above critical success, companies must plan the critical success factors at the same time and within a long range planning strategy. "*

Jeffcoate et al. (2002) present a qualitative method, which can help e-Businesses measure their performance. Their method is based on eleven criteria, which are divided into three phases.

- Factors that deliver competitive advantage from the start-up phase. These are commitment, content, price sensitivity and convenience.
- Factors that become important when growing and establishing the business. These are control, interaction and brand image.
- Factors that are important to ensure the business can support high volume e-commerce activity. These are partnership, process improvement and integration.

There are many examples of well known e-Businesses who managed to succeed. Companies like Amazon, E-Bay, Dell are distinct examples of success in the e-Business sector. *Chaffey (2002)* presents a case study of a less popular company that successfully implemented e-Business and recorded remarkable growth. The company is called Dow Chemical and their strategy is based on combining the use of their own website with independent e-marketplaces to communicate with customers. This allowed the company to create industry exchanges, which created a great network of transactions. Also, their strategy resulted in increasing numbers of visitors in their website. "*Their e-Business strategy has been recognized by many industry awards and had resulted in 15% of the company revenue being traded electronically by 2007*" *(Chaffey,2002).*

2.3.2. Failure factors and examples

On the other hand, there are examples of failed e-Business strategies, that are useful lessons towards avoiding the same errors. The dot.com bust that took place on the turn of the century provides many examples of unsuccessful implementation of e-Business.

O'Connor and Galvin(1998) present some examples of early e-Business failures like Pathfinder and Argos. Pathfinder was initially very successful and popular. However, key mistakes like undifferentiated targeting of consumers, poor Human-Computer Interaction attributes, such as navigation and layout and an unsustainable revenue model, led to huge losses for the company. Argos faced many problems with adapting to online transactions and understanding the consumer buying process in the Web. In one ten-month period Argos sold a total of 22 items from its Web site as a result of its failed strategy.

Boo.com was an online retailer of sport clothing and the company's vision was to become the world's first online global sports retail site. They created a very unique website, where people could try the products they wanted to buy on 3D models. They tried to launch their business in the US and Europe simultaneously in order to achieve their goal of being the world leader in online sport clothes retailing. However, there were major issues and challenges. First of all, the content of the website took much time to download, something that resulted in unsatisfied customers. Other problems involved the cost of developing the required software and the cost of populating the clothing catalogue. The biggest challenge though, was to build a global brand in a few months. "*Although there were naturally revenue projections, these were not always based on an accurate detailed analysis of market potential*."(Chaffey, 2002). After Boo.com was launched, the conversion rate was too small, the order completion time was too big and there were many other issues. In order to improve the functionality of the site and expand their business as planned to other countries further investments were required. After 6 months investor funds could not be raised and this led to the end of Boo.com. "*Boo.com is a valuable case study for all types of businesses,*

since it does not only illustrate the challenges of managing e-commerce for a clothes retailer, but rather highlights failings in e-commerce strategy and management that can be made in any type of organization."(Chaffey, 2002).

A combination of possible reasons can lead to the failure of an a-Business. Some reasons are related with the unique needs of the web environment and some others are classic mistakes that companies usually make. According to *Miller (2003)* companies use to overestimate how fast the market could adopt the dot com innovation. Many companies think that e-Business products can easily replace the traditional ones and conquer the market. However this is not always the case. Also, many companies rush to e-Business out of a sense of urgency and a fear not to be left behind thus increasing the probability of failure. *(Damanpour, 2001)*

There are other reasons that can lead to unsuccessful implementation of e-Business too. Companies need to study the market, in order to introduce a new and innovative product. As the Boo.com case showed, presenting a very good software which could not be supported by the bandwidth limits of that time, led to many problems. For this reason, sufficient research on market and customer demands should be conducted before launching a new service or product. Another common mistake is that many e-Businesses in order to start working as fast as possible, follow the same patterns. With the huge variety of available choices in today's Web this is not a good strategy. Innovation and creativity are essential and lack of any of those two can be disastrous for an e-Business. This is the main reason that in this project, much focus is given on market research. Exploring the gabs of the market and producing an innovative service is the only way to succeed.

2.4. Information Technology: Equal Opportunities for everyone?

Kuhn and Skuterud (2000) bring up a very interesting issue that rises with the implementation of Information Technology in the labor market. That is the problem of "digital divide". According to *Norris(2001)* digital divide is a multidimensional phenomenon. *OECD (2001)* defines digital divide as *" the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access Information and Communication Technologies and to their use of the Internet for a wide variety of activities.*"

In their research, *Kuhn and Skuterud (2000)* provide statistical evidence of various cases of digital divide in the field of searching jobs over the Internet. Their conclusions should be treated cautiously, since their findings are based on statistical surveys, which were conducted at the time. These surveys may be out of date nowadays. However, a very recent statistic research conducted by the National Telecommunication and Information Administration of the U.S. Department of Commerce, demonstrates that in 2009 digital divide is still an existing problem. According to the summary of the survey, "*data reveal that demographic disparities among groups have persisted over time. Persons with high incomes, Asians and Whites, the more highly-educated, those who are younger, married couples and the employed tend to have higher rates of broadband use at home."(NTIA, 2010)*

Before deciding in favor of building an e-Business for IT employment we should consider, if digital divide is a factor that could influence the acceptance of the final product. It is important for everybody to have an equal opportunity to use the website and its services. In this project, digital divide should not be considered as a major factor in the development of the e-Business. The main reason is that the website, which will be created, is an employment e-Business for IT graduates and employers in the IT industry. This implies that all the stakeholders have regular access to Internet services, regardless of race, nationality and social background. Also we can take for granted that they can take advantage of all the opportunities that web based services offer, because of their educational background.

2.5. Methodologies for building Websites

An innovative and revolutionary idea can provide the basis for a successful e-Business. Applying the correct business model and defining a specific strategy can increase the profit potential of the e-Business. However, technology and especially computer based technologies play a key role not only in the success of an e-Business, but also in its mere existence.

2.5.1. Software Engineering Methods

The core of every e-Business is a website. Websites are software artifacts, a fact that suggests that the understanding of traditional software engineering techniques is critical.(*Glass, 2001; Howcroft and Carroll, 2000;Jeary et al, 2009*). At this point, before looking at specific website development methodologies, it is essential to present the key advantages and disadvantages of some well-established software engineering techniques, in order to examine their applicability to the development of an e-Business website.

Software Development Method	Advantages	Disadvantages
Waterfall	• straight systematic flow • easily understood • well-established	• requirements list should be complete and finalized by the end of stage one. • errors of one stage transfer to all the next stages • no user feedback before the final product • new requirements are hard to implement • rigid structure
Prototyping	• communication with users • user feedback • lower maintenance costs	• can be time consuming because of user involvement • developing a prototype demands effort, time and money. • Increased development costs
Spiral	• allows new requirements to be added more easily • risk analysis • iterations	• risk analysis demands people with advanced knowledge in this field • time consuming
Agile	• early and constant user involvement • early deliverables • paired programming	• user involvement may lead to new requirements added continuously • difficult to reach customers

Figure 4. Comparison of Software Engineering Methods

The software engineering techniques, which are described above, have been proven successful and effective for traditional software development projects. However, the unique nature of the web and the special characteristics of website development make them unsuitable to be adopted as a whole. As *Howcroft and Carroll (2000)* state "*any methodology for website development must be generic and flexible enough to account for the uniqueness and individuality of websites, yet concise enough to achieve the task of development.*"

The continuous growth and the rapid changes in the web development sector, make the task of building a website much more challenging. Various methods have been developed over the years, which try to formalize the process of designing and building a website and are tailored to the unique nature of the Web. A number of these methods are presented below, in an attempt to conclude on the best approach to be followed for building the IT employment website.

2.5.2. Website Development Methodologies

Laudon and Traver (2007, p. 193) propose a five-step life cycle of developing an e-Business website.

- **System analysis/planning**. In this step business objectives are identified, in order for the project to have measurable targets and achievements. Also some functionalities of the system that the system must produce in order to achieve the business objectives, are defined.
- **System design**. In this step the main components of the system and their relationship to one another should be described. This phase consists of the logical design, where functions that are going to be performed, databases that are going to be used, security procedures and controls to be used, are all specified. This phase also includes the physical design, which is the materialization of the logical design.
- **Building the system**.

- **Testing the system**. Once the coding is complete the system has to be thoroughly tested. Unit testing involves the testing of the website's modules. System testing aims to test the site as a whole and ensure its functionality for the user. Acceptance testing is used to verify that the system meets the business objectives, that were defined in the system analysis phase.
- **Implementation and maintenance**. This step is very important, since websites, as any other software, may break down. They need continuous checking, testing and repair. A perfectly designed website, which is often unavailable due to technical reasons, is not a successful one.

This process, described by *Laudon and Traver (2007, p. 193)* is very abstract and does not focus on the details of each phase. It can only be used as a general guideline, since many methodologies follow similar steps to reach the goal of developing a successful website. A similar, though much more detailed approach, is the one proposed by *Howcroft and Carroll (2000).* The authors proposed their own methodology for website development after comparing a number of available methods, such as the "Four Phase Model" (strategy, design, production and delivery, designed by Siegel (1997) and Ikonic's Five Box Development Process (a five stage process, which highly depends on thorough documentation between each stage).

The method suggested by *Howcroft and Carroll (2000)* tries to combine the advantages of the compared methodologies that are presented in the relevant literature. Their method consists of four phases with several steps in each phase. An overview of the main points of this methodology is presented below.

Phase One: Analysis. Deals with the development of a web strategy and an analysis of how a website may achieve this strategy. The main objective of this phase is to reduce the risks of lack of top management commitment and misunderstanding the system requirements. This phase consists of three steps:

i. Development of a web strategy, which means defining where the organization is now, where the organization wishes to be and how it will get from the present state to the desired one.
ii. Defining the objectives.
iii. Objective analysis, which involves: technology analysis, information analysis, skills analysis, user analysis, cost analysis and risk analysis.

Phase Two: Design. *"The website should be designed with the knowledge that it is likely to have sections and processes added to it during its lifetime, as requirements change and new technologies emerge." (Howcroft and Carroll, 2000).* It consists of two steps:

i. Information and Graphics Design
ii. Testing of Design, since testing in the early stages can help prevent future errors and malfunctions of the website, making the whole development process more efficient.

Phase Three: Generation. It consists of the four steps that lead the project from the design phase to the actual generation of the website.

i. Resource selection
ii. Design Review
iii. Code generation and Installation
iv. Testing.

Phase Four: Implementation. This is an ongoing phase that does not stop after the development of the website. It involves:

i. Implementation
ii. Maintenance
iii. Objectives review

This method has some key advantages. It is well structured, detailed and simple to understand. It organizes the task of building a website into four well defined phases and provides further guidance to the developers by breaking down each phase into steps. Not only does it allow the tasks to be organized but it makes the tracking of the progress quite effective. On the other hand, *Howcroft and Carroll(2000)* provide a useful but general framework to assist in the web development process. Their methodology should be altered and adapted to the special requirements of this dissertation's project ,since it is not created to be efficient for e-Business websites. Also their methodology looks to be more appropriate and effective for larger projects, where developers have their own distinct roles.

Another interesting web development methodology, which follows the same pattern as the one presented above, is the one described by *Alexandrou (n.d.).* Based on his commercial experience as a Web Developer, he introduces a method which is also organized in phases. As *Alexandrou (n.d.)* states "*phases are typically used to communicate a grouping of deliverables and functional progression within a project timeline and to assess the progress of a project."* His methodology involves eight phases:

- Sales: identifying client opportunities, evaluating potential clients and market opportunities and prepare proposals.
- Project Initiation: gather together the project team and plan all the activities in detail.
- Analysis: defines the strategy, the processes and the financial viability of the solutions. It also involves defining technical and business functionalities of the solution.
- Design:"*undertakes a thorough creative design process that ensures the goals of the e-Business model are defined, designed and implemented in a creative solution."(Alexandrou, n.d.)*
- Development: involves prototyping and application building, unit and system testing.
- Implementation: producing the final system
- Production Operations: take all the necessary actions to ensure the viability of the solution for a long period of time.
- Project Close: ensure that the project is running as planned and according to user requirements.

The above methodology has similar advantages and disadvantages with the one of *Howcroft and Carroll (2000).* The main difference of this methodology and its main strong point is that it starts earlier than most of the other methodologies and it does not end until after the review of the final project by the client. This is very helpful in the first stages of the development process of the IT employment e-Business website, since it can provide a useful guideline on how to move from the original innovative concept to the first stages of building the website. It also provides useful guidance on how to make the final solution more viable.

A very interesting variation of the above methodologies is the one presented by *December(n.d.).* His method is not only based on six processes but also on six web elements, which the developer should take into account and try to develop through the building process. The six processes described by *December(n.d.)* are similar to the ones of previous methodologies. *Planning* for the audience and purpose, *analysis* (setting objectives and gathering domain information), *design*, *implementation, promotion, ongoing innovation*.

Through all these processes the developer should try to develop the following sets of information, as defined by *December(n.d.):*

- Audience information, which is an information set about the target audience of the website.
- The purpose statement defines the reason for and scope of the web's existence.
- The objectives list defines the specific goals the website should accomplish.
- The domain information is a collection of knowledge and information about the subject domain the website covers.
- The web specification is a detailed description of the constraints and elements that will go into the website.
- The web presentation is the full description of the technical structures (hypertext and other media) by which the web is delivered to the users.

The detailed documentation that this method suggests makes it easier to keep track of the progress of the project and it defines specific deliverables, which indicate the success of the various processes. This information-based method can also help the developers to understand the problem and the domain in depth and produce the most effective solution. As *December (n.d.)* states *"a web intended for business or professional communication needs to not only reflect a consensus of meaning among the sponsors and originators of the information, but it must reach a diverse audience and continuously change as user needs change".* However this method can be too complicated and time consuming for a simple web project and can result in loss of focus from the actual target, which is the website.

A different approach, which is based on the concept of Feature Driven Development is introduced by *Bauer (2005).* FDD is an agile development method and consists of five key processes. Developing an overall model, building a features list, planning, designing by feature and building by feature. One of the most important steps in FDD is to define the features of the project using the language of the business domain. *"This means that the client will be able to understand and value each feature but also enforces a common language across the project team and reduces the risk of miscommunication or assumptions" (Bauer, 2005)*. In order to implement FDD in web development, the author added some new elements, in order to develop a methodology that covers areas where FDD is ineffective. An overview of how FDD is applied in web development is presented below, in the form of tasks to be completed throughout the website development process.

- Project Overview, Purpose, Objectives and Scope
- Organization Purpose
- Target Market
- Content
- Information Architecture and Design
- Functionality
- Project Management, Daily Wraps and Progress Reports

This different method that *Bauer(2005)* presents has some key advantages. As any other agile methodology is client focused, which can lead to a better final product. Also, the fact that the project is build based on specific features leads to risk reduction, because each feature is well defined and the user requirements are clear. Also, this method allows better planning of the whole procedure and excellent reporting of the progress made.

On the other hand, there are some gaps in the web development process if this method is adopted. Once again, it is a method which is more effective for larger projects, which demand excellent project management. There are many steps related with project management, which in smaller projects can lead to inefficiency. The emphasis that this method gives on successful managing of the project, makes it very reliable on the people who are responsible for these roles. Another problem is that this methodology does not provide detailed guidance on how the testing of the product will be done, which is a very crucial step in website development.

The table below summarizes the strong points as well as the drawbacks of each one of the methods presented above.

2.5.3. Are website development methods the best practice?

Using a formal and well defined method in order to build a website does not only have advantages, but also has some significant disadvantages. Those drawbacks are more often than not, the reason that many developers choose not to follow specific methods in order to build their websites. *Jeary et al. (2009)* in their study, argue that the vast majority of practitioners do not use web development methods in their projects and try to explain the main reasons behind this choice.

The findings of their research are based on the study of the final year dissertations of 23 fourth year students on a BSc (Honors) in Business Information Technology degree. The students had to complete a development project and they were requested to choose from a variety of web development methods to use in their projects. The results of the study are very interesting, since only one student used a web development method for the whole process.

In order to understand the reasons that led students to not adapting the proposed methods, Jeary *et al.* (2009) conducted a comprehensive and exhaustive comparison of a number of available methods. Based on the observation that there is "*a chasm between the methods that academics are developing and the methods that practitioners require in commercial settings*", the authors argue that there is "*a lack of understanding of research outcomes by practitioners or the research outcomes are not yet suited to practical development and the field has not yet matured enough to have a viable approach to applied research.*"

Website Development Method	Advantages	Disadvantages
Laudon and Traver, 2007	• can be used as a general guideline • easily understood	• too abstract • the description of each stage is not detailed enough
Howcroft and Carroll, 2000	• well established • very detailed • organized development process • effective tracking of project's progress	• more effective for larger projects • not tailored to specific needs of e-Business
Alexandrou, n.d.	• starts very early in the development process • ends after the review of the final project by the client	• more effective for larger projects • no innovative elements in the development process. • no effective tracking of project's progress
December, n.d.	• information based • better understanding of the domain and the problem • effective tracking of project's progress	• time consuming • complicated • lose of focus from actual project
Bauer, 2005	• client focused • well defined user requirements • better planning • excellent reporting	• more effective for larger projects • too much focus on project management • testing is not well defined

Figure 5. Comparison of Website Development Methods

Jeary et al. (2009) structure their survey of methods based on four key criteria:

- **Scope** (methods that do not prescribe a particular methodological approach, methods covering the full life cycle, methods discussing a lifecycle approach but not covering some aspects in any detail)
- **Method Approach** (methods taking an ER(entity relationship) approach, methods taking an object oriented approach, methods based on neither ER or Object oriented approach)
- **Method Focus** (focus on pre-requirements, focus on user modeling/requirements, focus on conceptual models/design models, aiming to automate/part automated.
- **Teachability / learnability**

Jeary et al. (2009) conclude that the main problems of web development methods are:

- Their formality and ambiguity of terminology make them difficult to understand.
- They are incomplete since they do not describe each step in detail. Also they reflect their author's priorities, which may differ from each user's priorities.
- They lack detailed practical guidance. Many of them are quite abstract and do not provide in depth analysis of what the practitioner needs to do in each step of the methodology.

The survey of Jeary *et al.* (2009) explains in details the main reasons that make website development methods unsuitable to be used in practice and presents some key problems that arise by their adoption. A decision on whether to follow such a methodology for building the website for the project's e-Business was a crucial one for the further development of the project. After careful consideration and evaluation of the advantages and disadvantages that the usage of such a method would have and how it would affect the project, it was decided that it could be helpful and make the whole process more effective in the long run. A systematic methodology would allow the project to be better organized from the start, since it can help to focus on specific things to be accomplished and narrow down the vast area of e-Business development. It gives a detailed guideline, which can be extremely helpful in order to understand the main challenges of each step and the key objectives that should be accomplished before moving forward to the next stages. A very important reason, that led to the adoption of a website development method is time management. Following specific steps will help to set milestones, that would allow the project to stick to the desired timeline and would ensure that the project deliverables will not be behind schedule. Finally, those

methodologies are generic and can be altered according to the specific requirements set for this project. They are not strict rules, which should be followed as they are. A website development methodology will ensure better tracking of the progress and better organization of the work to be done. Additionally, the advice of the supervising professor was also favorable towards using a methodology that would be the guideline through all the stages of the dissertation.

3. RESEARCH METHODS

3.1. Project Overview

The technical challenges of designing and developing an e-Business web page are only one aspect of this project. Major part of the project is to acquire the desired knowledge, skills and experience to build an e-business website, based on the examination and analysis of user requirements and market needs**.**

The main idea is to create a dedicated website that would provide employment services to IT students and graduates as well as to potential employers from the IT sector, which assumes a basic seeker-provider model. This website will allow IT students/graduates and potential employers to have access to a dedicated website, consisting of students/graduates seeking jobs and employers who provide them. The site will hold details of job vacancies in a database and will allow searches to match seekers with providers. The website will be controlled by an organization (the Business) intended to be separate from both students and employers. Students and employers will only access their parts of the website and can only communicate with the e-Business.

3.2. Project Objectives

The final deliverable of the project is an IT employment website, which, in general terms, is described in section *3.1. Project Overview,* along with a detailed report of the methodology that will be applied. However, there are some vital objectives, which should be accomplished, in order to allow the completion of the project. These are:

- Conduct thorough **problem investigation**, which involves literature review, stakeholder analysis and evaluation and comparison of similar websites. This is the only way to understand the wider context of the problem, identify the target audience of the website, find out how other IT employment websites work, and discover possible gaps in the IT employment market. This will lead to a preliminary e-Business proposal.
- Come up with an **innovative proposal** that aims to fill the identified gaps of the market. This will be the basis for a dedicated website tailored to the needs of the stakeholders.
- Investigate and understand **market research** methods. Compare their advantages and disadvantages in order to choose the right one for testing the feasibility of the initial e-Business proposal with various stakeholders.
- Compare various e-Business models in order to choose the most suitable to use as the basis to make the **business case** for the proposal.
- Understand the strong and weak points of several **website development methods** and pick the methodology that will be the guideline of the project.

3.3. Project Plan

The project will be completed in three phases. The first one consists of the literature review and the critical analysis of relevant work. The goal of this phase is to understand the problem of creating a successful e-Business as a whole and set the framework that will guide the development process. This Background Report is the main deliverable of this phase. The second phase is the development process. During this phase the proposed methodology, which is presented above(*section 3.5. Project Methodology),* will be followed, in order to systematically create the IT employment e-Business. The key deliverable of this phase is a fully implemented, working website, which would offer the desired employment services to the stakeholders. The third and last phase of the project is the writing of the dissertation thesis, which would

present the development process in detail, along with research results and conclusions. A detailed Gantt chart of how the project is planned to progress, is available in the Appendix A of this report.

3.4. Project Methodology

The decision on which method to follow throughout the project is vital for the progress of the project. After conducting a thorough and critical research on various well established methods*(section 2.5.2 Website Development Methodologies)* and discussing the results of the research with the supervising professor, certain decisions were made.

The project's methodology should follow, in general terms, the phases of the method proposed by *Howcrofft and Carroll(2000).* This method has a very detailed description of the various steps that are followed for the development of the website, so it is regarded as the most useful guideline for the IT employment website. Moreover, it allows excellent tracking of the project's progress, something which is essential for an academic project, which needs to adhere to a specific timeline. The problem of this method is that it does not focus on problem investigation and market research, which is a key objective of the project. For this reason, after further discussion with the supervising professor, more phases were added, which would be tailored to the specific needs of this e-Business project and would help to achieve all the project's objectives.

The methodology that will be applied consists of nine phases and iteration between them is desirable if needed.

- **Problem Investigation.** The main aim of this stage is to understand gaps in the market and produce a template of a preliminary e-Business proposal to test in market research. The following steps are essential to achieve this goal:
  i. *Website evaluation,* in order to examine existing solutions of IT employment in the market and compare them according to a set of predefined criteria.
  ii. *Stakeholder analysis*, in order to identify the target market for the e-Business. Two are the main stakeholders of the website: IT graduates/students and potential employers. Students/graduates will submit their CVs in the system, while employers will place advertisements for potential jobs that they have to offer. Other key stakeholder of the e-Business is the company that will run the e-Business website and will have administrative rights in the system. It will be responsible for matching candidates with potential employees. Stakeholders play a key role for the development of the website so often communication with them should be established in order to understand their needs and requirements.
  iii. *Market research*, in order to test the feasibility of the e-Business proposal and highlight stakeholder needs. The comparison of various market research methods, which is presented in section *3.4.2. Market Research*, provided a guide on which is the most suitable method for the needs of this project. Market research's aim is to elicit the opinion of stakeholders on the proposed e-Business solution. The results of the research should be as specific as possible and targeted to particular aspects of the proposal. Additionally, the proposal should be thoroughly presented to the participants, in order to explain all the unique and innovative features of the proposed website but also in order to point out the differences from other similar websites.
- **Business case.** In this phase a suitable e-Business model is chosen and is used as the basis to make the business case for the proposal. The differences between my proposal for an IT employment website and the competition should be analyzed. Also, the marketing and financial(costs and benefits) plans for the e-Business should be presented.
- **Requirements.** In this phase a thorough list of user requirements should be conducted, based on the needs that were established in the problem investigation phase. These requirements should be structured and prioritized. Innovative requirements that would satisfy stakeholder needs are the main goal of this phase.
- **Analysis.** In this phase, key functions of the IT employment website should be defined. The architecture of the system, the layout, the navigation and some dynamic aspects of the website should be decided. The main aim is to decide what human activities the e-Business will assist.

- **Design.** Key design decisions should be made in this phase. Hardware/software to be used, implementation of database-server-browser connection and algorithms to perform queries are some vital design goals.
- **Implementation.** Writing of the necessary code to create the e-Business.
- **Walkthrough.** This involves the presentation of the operations of the e-Business website.
- **Evaluation.** The main goal of this phase is to evaluate the IT employment website by stakeholders. It is a key phase and will be repeated several times during the development of the website in order to make sure that the final website will comply to all the requirements set by the stakeholders. At initial stages of the website, its evaluation will be done by crosschecking that it complies to all the requirements defined by the market research. As new features are added to the website, the evaluation will be done with the help of some stakeholders. The evaluation process will involve a set of activities that each evaluator should perform on the e-Business website, so that all its features will be tested. The evaluators will have a predefined list of criteria upon which the website should be tested, and they will assign marks for each action performed in the website prototype. Furthermore, they will be able to make suggestions about things to be added, changed or removed. This will result in discovering possible mistakes or design errors in the website and also will help in understanding which are the strong points of the website. The evaluators will be carefully chosen in order to have the experience and the knowledge to provide the required information. The evaluation process has to be well organized, because it can turn out to be very time consuming.
- **Reflection.** Comparing the process that will be followed for this project to other methodologies and come up with useful conclusions on strong points, possible errors and areas of improvements.

3.5. Background and Selected Approach

In the proposed methodology, which is described in section *3.5. Project Methodology*, a vital and key phase is problem investigation. The results of the conducted research, which aimed to examine and compare various ways to complete the steps of problem investigation phase, are presented in this section. Furthermore, this section includes a detailed analysis of some popular business models that are usually applied in e-Business companies. This analysis will lead to the choice of the suitable business model that will be applied in the IT employment e-Business and will be the basis for the business case.

3.5.1. Website Evaluation

The main target of this project is to develop an innovative IT employment e-Business website, with unique features, that are not met in other similar websites. The first and very significant step towards this goal is to examine the characteristics of similar websites, that are already in the market. Comparing a number of similar websites against a set of predefined criteria, will be the best way to discover what these sites have to offer and will be the basis for discovering possible gaps in the market and introducing the field with an innovative and pioneering e-Business solution. A survey of the relevant literature in the topic of website evaluation will provide the background for the set of criteria to be used, while comparing the IT employment websites.

Nielsen and Molich (1990) present a very interesting method to evaluate the usability of a website. This method is called *heuristic evaluation*. "*Heuristic evaluation is a method for finding usability problems in a user interface design by having a small set of evaluators examine the interface and judge its compliance with recognized usability principles (the "heuristics"). (Nielsen, 1992)*

Nielsen and Molich (1990) have also defined a simple and practical basis of criteria. These criteria are called *heuristics*. Those are:

- simple and natural dialogue
- speak the user's language
- minimize user memory load
- be consistent
- provide feedback
- provide clearly marked exits
- good error messages
- prevent errors

Heuristic evaluation has some very important advantages. "*It is cheap, it does not require advance planning, it is intuitive and it is easy to motivate people to do it and it can be used early in the development process". (Nielsen and Molich, 1990).* However, the most significant disadvantage of this method is that it is

mainly useful in order to identify problems with the user interface. It is not a very useful method in order to find solutions to the problems. Moreover, the results of the evaluation can be biased. For this reason, as *Nielsen and Molich (1990)* conclude in their research, it is crucial for the success of the method, to have more than one evaluator look at the interface. Several people conducting the evaluation independently will bring satisfactory results.

Zhang and von Dran (2000) present another interesting method of evaluating the user interface of a website. They propose a two factor model, which can provide the guideline for Website design and evaluation. Those factors are Hygiene and Motivator. Hygiene factors are defined as "*those whose presence make a Website functional and serviceable, and whose absence causes user dissatisfaction*". Motivator factors are "*those that add value to the Website by contributing to user satisfaction"*. Motivational theories play a major role to this proposed model. As *Zhang and von Dran (2000)* state, "*motivation is one of the major individual level variables that determine productivity"*. The whole model of the hygiene and motivator factors is based on Hezberg's motivational theory. Herzberg made the same separation between hygiene and motivation factors, while examining the factors that lead to job satisfaction and dissatisfaction.

In order to verify the validity of this model, *Zhang and von Dran (2000)* conducted a two phase empirical study. At phase one, they constructed a list of 44 core features organized in 12 categories. They used cluster analysis to come up with an initial categorization of the features. Then they asked a sample of 37 computer science students to classify those features according to their criteria and add more features if they thought it was necessary. At the second phase of their study, they identified hygiene and motivator factors out of the list of the core features and categories. Their results are presented in Table A and Table B in the Appendix B of this report.

The Hygiene/Motivator model can provide a helpful guideline to decide on which criteria are more important, when evaluating a website. This classification can be vital in order to understand, which are the essential features of a website and which can be omitted. However, the classification of a feature as hygiene or motivator, depends highly on the perspective of each user. For this reason, this method demands a big number of evaluators of different background. The fact that *Zhang and von Dran* only used computer science students as a statistical sample, makes the results more biased due to their common educational background. Another disadvantage of this method is that there are no predefined criteria against which the website is evaluated. Each evaluator can add his own criteria, which would increase the difficulty of categorizing every new feature.

Barnes and Vidgen (2002) in their research paper present another interesting method of assessing the quality of e-commerce. This method is called WebQual and has been applied to various domains. The evaluation procedure is based on three main dimensions. Web site usability, information quality and service interaction quality. According to *Barnes and Vidgen (2002),* "*although WebQual is grounded in the subjective impressions of Web site users, the data collected lends itself to quantitative analysis and the production of e-commerce metrics such as the WebQual Index. The WebQual Index gives an overall rating of an e-commerce Web site that is based on customer perceptions of quality weighted by importance. WebQual has evolved from three core research areas: information quality from mainstream IS research, service interaction quality from marketing and usability from human-computer interaction."*

In their research paper *Barnes and Vidgen (2002)* present the results of the application of WebQual 4.0 (the latest version of the method) to the evaluation of UK internet bookshops like Amazon, BOL and Internet Bookshop. As part of the method an online questionnaire targeted at real users of those e-Business firms was created. The users were students, who are experienced in buying books online and are familiar with the area of e-commerce. Data from these online questionnaires were analyzed using a variety of statistical methods. The results of the analysis showed that five factors appeared to be the most important in evaluating the online bookstores. Usability, design, information, trust and empathy. These factors were grouped into three main categories:

- Usability – usability and design
- Information quality - information
- Service interaction quality – trust and empathy.

This method, suggested by *Barnes and Vidgen (2002),* provides a trustworthy instrument to evaluate an e-Commerce. The most significant advantage of the method is that the result of the statistical analysis is

a single index, which can be used to compare similar websites easily and efficiently. However, this method involves advanced statistical analysis of a large volume of questionnaires. Expertise in the field of statistical analysis is crucial, in order for this method to have the desired results. Another disadvantage is that the WebQual index is very useful, when it comes to comparing an e-commerce company with similar companies of the same sector. The index is not as efficient when it comes to evaluating an e-business against some criteria and not against other e-Businesses.

Based on the above research and by weighting the advantages and disadvantages of each method, it was decided that a combination of the Heuristic evaluation method (Nielsen and Molich, 1990; Nielsen,1992) and the Hygiene-Motivator model (Zhang and von Dran,2000) would be the best method to follow in order to construct the evaluation criteria for the various IT employment websites, that currently exist in the market. Heuristic evaluation is a cheap, easy and very popular method and can be easily applied to find problems in similar websites. The Hygiene-Motivator model can provide valuable insight into what the stakeholders regard as essential features for an IT employment website. This will eliminate the risk of overlooking vital features in the design of the e-Business website. Finally, two of the four proposed value drivers by Amit and Zott(2001), novelty and lock-in, will be used as additional criteria, because innovation and user loyalty are regarded as important success factors for an e-Business. After constructing the list of evaluation criteria, then a range of around 15-20 IT employment websites will be tested against this list. In order to achieve more reliable results, the evaluation process will be repeated by a small number of stakeholders, something that would help to highlight important issues and problems, that the stakeholders identify in the websites. It would also provide valuable feedback for the formulation of the project's e-Business proposal.

3.5.2. Market Research

The importance of market research in order to achieve the main objectives of this project has already been mentioned. After evaluating similar websites and finding gaps in the market, it is essential to test the viability of the project's main idea against the market. As defined by *ICC/Esomar(2007) "market research is the systematic gathering and interpretation of information about individuals or organizations using the statistical and analytical methods and techniques of the applied social sciences to gain insight or support decision making".*

There is a variety of methods for conducting market research. Each one of them is suitable for specific applications. The choice of the right method for a specific project is crucial. A presentation of the available market research methods along with a comparison of the advantages and disadvantages of each one is presented below.

Secondary Market Research involves studying data which are collected by someone else and for some other reason that is relevant to the project's scope. It is used to *"identify market opportunities, describemarket structure and monitor competitive activity." (McQuarrie, 2006, p.34).*

Secondary research can be useful at initial stages of the project, since it is a quick and cheap way to gather some useful information and gain insight about the market. Secondary research data can help the researcher to better understand the problem at hand and clarify some key points of interest. For example, the researcher can find out that the information he is looking for is already available and a similar research has been conducted. Also secondary research can help us understand challenges that we may encounter and evaluate the potential difficulties in comparison to the benefits that we will gain, if we go on to perform our own research. Furthermore, data from secondary research are easy to access, especially with the growth of the Internet, which provides online access from any location to a huge collection of data. Also, it is less expensive for researchers to acquire them, since there is no need to carry out the research by themselves.

On the other hand, this method is not tailored to the specific needs and requirements of each project, so it is not very accurate and not as useful as other methods. The domain of interest or the form that the results are presented may differ from what the researcher needs, so the secondary data may not be useful. More often than not, data from secondary research can be out of date. Finally, the fact that secondary research is performed by others, makes their results questionable and highly dependable on the

other researcher and the quality of the work they have done. For this reason, these results should be critically evaluated and the method that was followed should be carefully analyzed.

Surveys involve asking a number of fixed and predefined questions to a sample of stakeholders. The sample should be chosen very carefully and meet specific demands. It should be large enough and it should be selected in order to be representative of the total population. Surveys are extremely useful, when secondary data are not available and the project demands for specific and precise data, which can help to better understand the target market. Another advantage of surveys is that they are inexpensive and quick and can be easily controlled remotely, something that reduces effort. Surveys are capable of producing very large samples, something that makes the results statistically reliable. Additionally, the fact that the majority of the questions are standardized, makes the measurements more precise and more easy to quantify and the results more objective.

There are some key disadvantages of questionnaires. They are not suitable to provide information on some intangible issues, like behavior and emotions. Moreover, the questions, which are created by the researcher, are mainly standardized, something that makes the results highly dependent on the researcher's view of the subject. The researcher is the one that judges what is important, but this may lead to missing some key points that they have overlooked. Standardized questions create some more problems, since the participants may interpret some questions differently and this will result in different answers. Furthermore, this misinterpretation cannot be passed to the researcher and the subjective view of the participant on some points is ignored. Finally, the fact that the researcher usually has no contact with the respondents, when they complete the questionnaire, results to uncertainty about how much thought each one has put in answering the questions and how valid the results are.

Focus Groups is very popular and effective technique. *Morgan (1996)* defines focus groups as *"a research technique that collects data through group interaction on a topic determined by the researcher."* Focus groups are also defined as "small group discussions, addressing a specific topic, which usually involve 6-12 participants, either matched or varied on specific characteristics of interest to the researcher". (Fern, 1982; Morgan & Spanish, 1984).

An advantage of focus groups is that participants' replies are less standardized. Surveys can be much better to elicit yes/no answers but discussions in focus groups can be more open-ended. Additionally, focus groups can help to get more in depth information. Interaction between participants plays a key role in focus groups. Morgan and *Krueger (1993)* emphasize that *"such interaction offers valuable data on the extent of consensus and diversity among the participants."* Focus groups are a flexible method both in terms of questions asked and in terms of desired results. The discussion between the participants, which is the key aspect of focus groups, demands from them to seriously think their responses and results in higher quality data. Furthermore, participants do not have to answer standardized questions, something that allows them to better understand the context of each question and better formulate their opinions in the subject. Additionally, the researcher is able to better explain his questions and his points of focus. Moreover, the researcher who assembles the focus groups can invite people of specific background and knowledge on the domain of research. This eliminates the risk of getting data of poor quality.

There are some issues and problems with focus groups. One disadvantage is that focus groups depend highly on the moderator and his ability to guide the discussion *(Morgan, 1996).* He has to be experienced and know exactly what he is trying to get out of the discussion, otherwise this may lead to lose of focus from the participants. Furthermore, the moderator needs to make sure that all participants express their own opinions and views and the discussion is not dominated by a few of them. Also focus groups demand more time from the participants so it might be more difficult to assemble proper groups. The results of the discussion are not statistical data and need more effort to be properly analyzed. Finally, the nature of focus groups demands for fewer people to take part, so the results are not representative of a big sample of the population.

Personal Interviews is a method that also involves unstructured, open-ended questions. The main advantage of this method is the additional information that the interviewer can extract from the face-to-face communication. Interviews help the researcher to gain deeper understanding of the participants'

responses. They are very useful to obtain information about feelings and opinions. The researcher can change some questions according to the response and can pick non-verbal cues from the respondent. The researcher has the chance to ask more detailed questions and even ask follow-up questions in order to clarify the response. Each participant is free to express his own opinion and there is no risk of being influenced by other participants as in focus groups. Additionally, interviews usually achieve a high response rate. Interviews, as well as focus groups, yield valuable insights into customer attitudes and are excellent ways to uncover issues related to new products or service development. Finally, they can be targeted to specific people who will provide valuable information on the area of research, based on their knowledge and experience.

On the other hand, there are some main problems with personal interviews. It is a costly method that requests many resources. The process of setting up an interview and analyzing its results can be very time consuming. Interviewers should be well trained and much effort and money should be spent in order to conduct as many interviews as possible. This results in a smaller sample available. The data collected by personal interviews are more subjective and because of the small number of respondents, they can be less reliable. Finally, this method is also highly dependable on the skill and the experience of the interviewer, since he is the one who has to extract the information from each participant and be able to interpret each answer in the right way.

Based on the context and the pre-requirements set for the market research method in section *3.4. Project Methodology* and following the suggestions of the supervising professor, the following approach will be applied. In order to test the proposal against the IT students/graduates, focus groups will be assembled. This is because focus groups provide the chance to present the proposal and explain any misunderstanding that there might be. Open ended question provide a better way to find out the opinions of IT students/graduates for the website than standardized questionnaires. Also, results will be much more targeted to the needs of the project. Finally, assembling a group of IT students does not demand much effort, since they are easily accessible via common lectures and social connections. Three groups of 6 students from the University of Manchester will be assembled. Participants are students pursuing their Masters Degree in Advanced Computer Science, Advanced Computer Science and IT Management and Information Systems. This ensures that the participants have the required background to effectively contribute to the discussion, in order for valuable information to be extracted. Also, three different programs were chosen in order to ensure diversity in the results and different views on the subject.

In terms of testing the proposal against the second group of stakeholders, the employers, the method of personal interviews was chosen as the most suitable. The decision was based on the tight time schedule that these professionals have. Managing to assemble a group of potential employers to discuss on a university project would be a very difficult task. Additionally, interviews are very helpful to get information from the participant, regarding their feelings and opinion in the proposed e-Business. Four to five employers will be contacted by phone and the innovative idea behind the project's employment website will be presented. Moreover, the key differences of the project's proposal will be made clear in order to evaluate their reactions. An attempt will be made to conduct two face-to-face interviews with other two employers, in order to ensure higher quality in the collected information. The majority of the employers will be medium size IT companies based mainly in the UK. Additionally, companies from Greek IT industry will be contacted, because of social connections, that would make the interview arrangement process an easier task and would ensure better response rate.

3.5.3. Business Models

Every company aims at becoming a leader in their field. This can be achieved, if they follow specific steps. Firstly, the product or the service, that a company provides, should be innovative and attract the interest of the customers. Secondly, building a healthy relationship with the customers is essential. Moreover, well management of the infrastructure of the company (resources, partner network etc.) can bring great results. Finally, companies need to manage the information that they have access to and gain valuable knowledge for the market, their customers, the products and the competition. (*Saini et al, 2009 ; Dubosson-Torbay et al., 2001*). Many business models have been developed, in order to allow companies to

chase their leading role in the market. Especially, in e-Business, choosing the right business model is vital. The huge variety of different forms of e-Business in the Internet creates the need of a categorization of business models, which would make the choice of the right one an easier and more efficient procedure.

Rappa, M. (2001) provides an extensive and thorough presentation of many different e-businesses, which he splits into nine different models.

- **Brokerage:** the main characteristics of this model is the "*involvement of third parties, whose goal is to bring sellers and buyers together in order to enable transactions"(Rappa,M. 2001).* It can include marketplace exchange, buy/sell fulfillment, demand collection system, auction brokers, transaction brokers, distributors, search agents and virtual marketplaces.
- **Advertising:** the website provides content and services mixed with advertising messages. This can include portals, classifieds, user-registration sites, query-based paid placement, contextual advertising/behavioral marketing, content-targeted advertising.
- **Infomediary:** in this model analysis of data is of great importance both for companies in order to understand their customer habits and for customers in order to gather information about specific products.
- **Merchant:** this model deals with products of wholesalers and retailers. It can include virtual merchant, catalog merchant, click and mortar and bit vendors.
- **Manufacturer(direct):** this model allows manufactures to directly reach customers and sell their products and services. This model results in a minimized distribution channel.
- **Affiliate:** this model provides purchase opportunities wherever people may be surfing. It offers financial incentives to affiliated sites.
- **Community:** this model depends on user loyalty. It can include open source, open content, public broadcasting and social networking.
- **Subscription:** in order for users to use the services of the e-Business, they have to pay a fee in the form of a subscription.
- **Utility:** this model is based on the "pay-as-you-go" approach. Metered services are based on actual usage rates.

Laudon and Traver(2007, p. 68) present a thorough categorization of business models applied in e-Business. The interesting thing in their research approach is that they examine separately models of different e-Business sectors. They create a different categorization for the B2C and the B2B sector and they examine some business models that have been developed along with some emerging e-Commerce areas, like C2C, P2P and M-commerce.

The main results of this classification are presented in the Table A and B in the Appendix C.

Comparing these classifications, we can identify business models, which are similar to all of them. These are the most common and widely used e-Business models, such as Portals, Transaction Broker, Virtual merchants, Brick-and-click stores and E-tailers . Additionally, the major advantage of the categories that *Laudon and Traver(2007, p. 68)* present, is the fact that there is a clear distinction between models applied to B2C companies and those applied to B2B companies. This can be helpful for a company, in order to cross out some of the candidate models, when trying to pick the right one for its e-Business design.

Additionally to this, something that has to be mentioned in this literature survey, is the fact that there is no specific number of models and new ones are created continuously. The rapid development and the fluid environment of the Internet results in a variety of models, which makes their classification a taunting task. Furthermore, each model does not necessarily fit in one strictly defined category. Building a successful e-Business includes, more often than not, the combination of more than one business models. These classifications presented above should be indicative guidelines, but not strict rules.

4. Summary and future research

The current work is the initial background report for the e-Business website development project. This report aims to provide a critical review of the relevant literature in the e-Business field and also to describe key aspects of the methodology that will be applied throughout the project.

This report tries to examine various issues that arise while building an e-Business. It is important to highlight, that e-Business websites are not simple software artifacts. Mastering the necessary software skills and tools to build a website does not guarantee its success. For this reason, following the guidance and the advice of my supervising professor, this report focuses on many other challenges that come up through the development process, like performing website evaluation, conducting market research and choosing the right business model for the e-Business proposal. These are the first and most crucial steps that will ensure that the final IT employment website, will be developed according to the requirements of the market and will be tailored to the needs of its users. Further research and more focus will be given on software tools after these parts of the methodology are complete and will be presented in later stages of the project.

The decisions on how the website will be build depend on the results of the problem investigation stage, since they will play a major role into describing the specific user requirements for the software. The decision will be based on evaluating case studies of website development, in order to examine a vast variety of techniques and software tools that have been applied successfully in real projects. Furthermore, further research will be conducted to spot the strong points of various techniques and justify the choice that will be finally made. Finally, an attempt will be made to contact some experienced web developers and ideally some web developers who have worked on similar projects, in order to absorb valuable knowledge from their experience.

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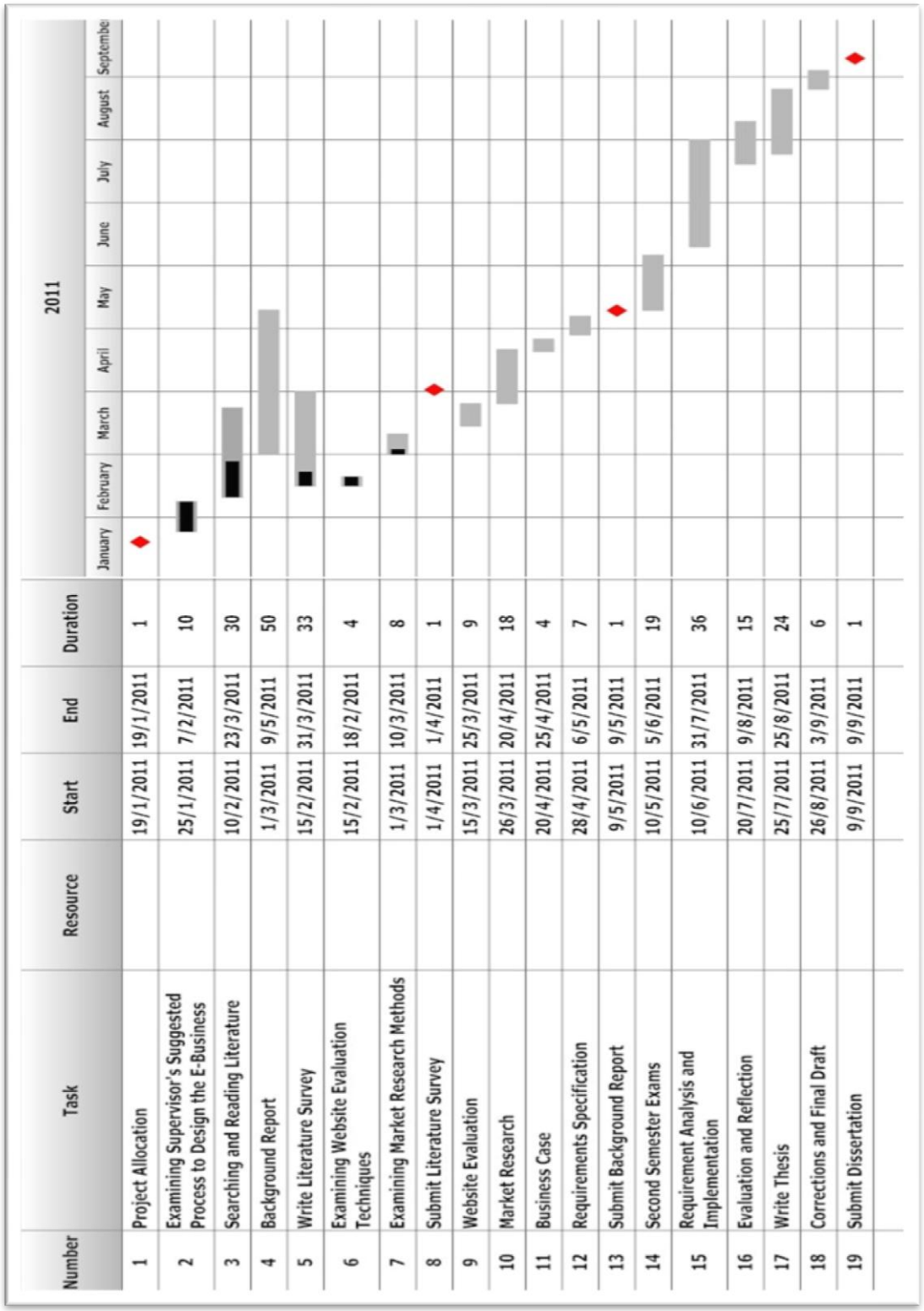
Appendix A - Gantt Chart



Number	Task	Resource	Start	End	Duration
1	Project Allocation		19/1/2011	19/1/2011	1
2	Examining Supervisor's Suggested Process to Design the E-Business		25/1/2011	7/2/2011	10
3	Searching and Reading Literature		10/2/2011	23/3/2011	30
4	Background Report		1/3/2011	9/5/2011	50
5	Write Literature Survey		15/2/2011	31/3/2011	33
6	Examining Website Evaluation Techniques		15/2/2011	18/2/2011	4
7	Examining Market Research Methods		1/3/2011	10/3/2011	8
8	Submit Literature Survey		1/4/2011	1/4/2011	1
9	Website Evaluation		15/3/2011	25/3/2011	9
10	Market Research		26/3/2011	20/4/2011	18
11	Business Case		20/4/2011	25/4/2011	4
12	Requirements Specification		28/4/2011	6/5/2011	7
13	Submit Background Report		9/5/2011	9/5/2011	1
14	Second Semester Exams		10/5/2011	5/6/2011	19
15	Requirement Analysis and Implementation		10/6/2011	31/7/2011	36
16	Evaluation and Reflection		20/7/2011	9/8/2011	15
17	Write Thesis		25/7/2011	25/8/2011	24
18	Corrections and Final Draft		26/8/2011	3/9/2011	6
19	Submit Dissertation		9/9/2011	9/9/2011	1

Appendix B. Hygiene and Motivator factors

Hygiene Categories	Motivator Categories
Technical Aspects	Enjoyment
Navigation	Cognitive Outcomes
Privacy & Security	Credibility
Surfing Activity	Visual Appearance
Impartiality	User empowerment
Information Content	Organization of Information Content

Table A. Source: Zhang and von Dran (2000)

Hygiene Features	Motivator Features
Attractive/unattractive screen background and pattern	High/low level of learned new knowledge and/or skills by doing the surfing activity on the Website.
Complete/incomplete coverage of information	Presence/absence of use of humor
Biased/unbiased information	Fun/no fun to explore
Presence/absence of identification of site owners/designers	Presence/absence of external recognition of the website (e.g., the site won awards, number of times the Website has been visited).
Presence/absence of access requirement	High/low reputation of the Website owner
Structure of information presentation is logical/illogical.	Appropriate/inappropriate detail level of information
Presence/absence of gender or racial/ethnic biases and stereotypes	Presence/absence of multimedia
Authorized/unauthorized use of the user's data for unanticipated purposes	Presence/absence of controversial materials
Relevant/irrelevant information	The surfing activity has a high/low level of challenge
Presence/absence of indication of system loading/responding time	Users can/cannot control opportunities for interaction
Presence/absence of improper materials	Users can/cannot control complexity of mechanisms for accessing information
Authorized/unauthorized collection of user data	Users can/cannot control difficulty level of information to be accessed
Up-to-date/outdated information	Presence/absence of novel (new) information
Users can/cannot control order or sequence of information access.	Presence/absence of eye-catching images or title on the homepage
Presence/absence of overview, table of contents, and/or summaries/headings.	Visually attractive/unattractive screen layout
Effective/ineffective navigation aids	Importance/lack of importance of the surfing activity to the user
Accurate/inaccurate information	Presence/absence of assurance that user entered data is encrypted
Information on the Website stays/does not stay for a period of time	Attractive/unattractive overall color use
Sharp/fuzzy displays	Users can/cannot control how fast to go through the Website
Support/lack of support for different platforms and/or browsers	
Stability/instability of the website availability	
Adequate/inadequate brightness of the screens/pages	
Presence/absence of indicators of the user's location within the Website	
Clear/unclear directions for navigating the Website	
Content that supports/does not support the Website's intended purpose	

Table B. Source: Zhang and von Dran (2000)

Appendix C. Categorization of e-Business Models

B2C Business Models		
Business Model	**Variation**	**Description**
Portal	Horizontal/General	Offers an integrated package of content and content-search.
	Vertical	Offers products and services to specialized marketplaces.
	Search	Focus on offering search services
E-tailer	Virtual Merchant	Online version of retail store, where customers can shop from their home all day long.
	Bricks-and-Clicks	Online store of a company that has physical stores.
	Catalog Merchant	Online version of direct mail catalog.
	Manufacturer-direct	Manufacturer sells direct to customers through online channels.
Content Provider		Information and entertainment providers that offers customers news and special-interest how to guidance and tips.
Transaction Broker		Third parties that process online transactions. They Increase customers' productivity by making things faster and easier.
Market Creator		Web-based businesses that use Internet technology to Create markets that bring together buyers and sellers.
Service Provider		Companies that make money by selling services to customers and not products.
Community Provider		Social network sites where people can meet online.

Table A. Source: Laudon and Traver, 2007, p. 69

B2B Business Models	
Business Model	**Description**
NET MARKETPLACE	
E – Distributor	Single-firm online version of retail and wholesale store
E- Procurement	Single firm creating digital markets where sellers and buyers transact for indirect inputs.
Exchange	Independently owned digital marketplace for direct inputs.
Industry Consortium	Industry-owned vertical digital market open to select suppliers.
PRIVATE INDUSTRIAL NETWORK	
Single Firm	Company-owned network to coordinate supply chains with a limited set of partners.
Industry - wide	Industry-owned network to set standards, coordinate supply and Logistics for the industry.

Table B. Source: Laudon and Traver, 2007, p. 78