

# CHALLENGING IN DESIGNING WEB BASED INFORMATION SYSTEM

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## ABSTRACT

*The web-technology is going through major changes these years, both with respect to types of systems based on web-technology, organization of the development work, required approaches and competencies, etc. We must rethink the organization of the development work. This requires a deeper and coherent understanding of the nature of web-development. This paper presents findings from a field study undertaken in a web-development company. From these findings we characterize web-application development and discuss some major challenges to cope with and to find proper support for in the future. We found that web-development is characterized by involvement of many expertise groups with little training and experience in information systems design, that some of the existing modeling and communication tools introduce severe problems, and that the pace of the introduction of new tools and features causes development and management problems. A further complication factor is that web-applications of today often are business critical systems.*

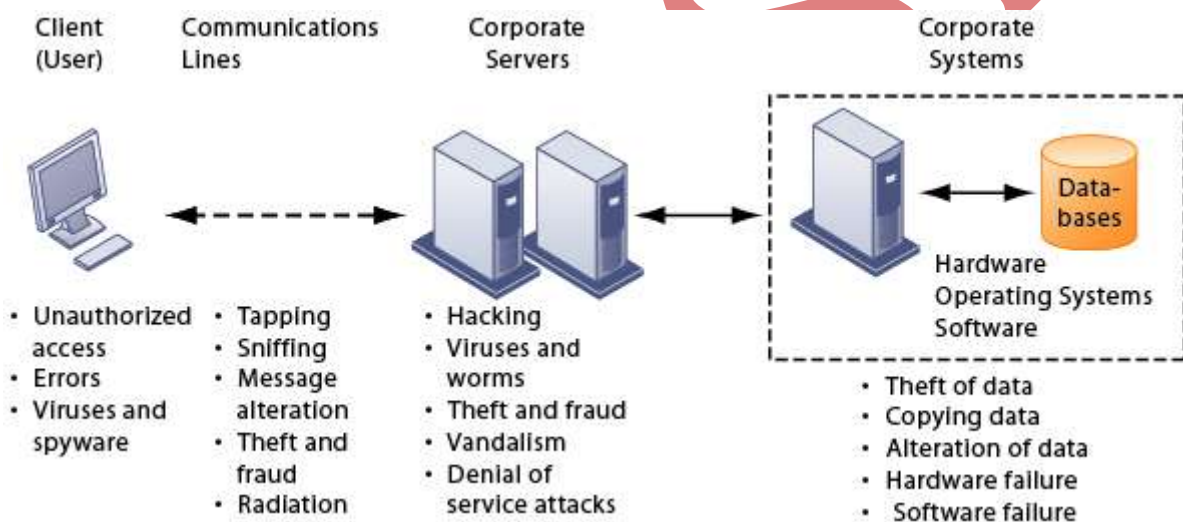
## I. INTRODUCTION

As a basis for designing complex information systems the Web-technology has matured a lot over Much of the literature on web-design concerns the new potentials, possibilities and challenges for business and user organizations. Examples are articles on the potentials of the new technology in terms of 'perfect communication and information transmission' (e.g., Turoff and Hiltz, 1998), challenges when setting up the e-businesses or changes in the supply-chain relationships as a result of web-based e-business (e.g., Baron et al., 2000). Of course are these aspects essential when discussing web-based information systems. They are however considered out of scope. In order to come up with ideas, recommendations, tools, techniques, concepts and methodologies supporting the processes of developing web-based information systems we need a better understanding of what characterizes development of large scale web-applications today, who are involved, what expertise is needed, what are the essential problems, etc. Much of the literature on web-design concerns the new potentials, possibilities and challenges for business and user organizations. Examples are articles on the potentials of the new technology in terms of 'perfect communication and information transmission' (e.g., Turoff and Hiltz, 1998), challenges when setting up the e-businesses or changes in the supply-chain relationships as a result of web-based e-business (e.g., Baron et al., 2000). Of course are these aspects essential when discussing web-based information systems. They are however considered out of scope. The need for new competencies, new roles, new approaches and methodologies, new ways of organizing the development work, etc. has been widely recognized. The aim of this paper is to contribute to our understanding of the nature of development of web-based information systems. We do this by reporting from a 'real-life study'.

## II. OVERVIEW OF CURRENT APPROACH

Presentation of business and service offers through the web is conveyed by developers' ideas and customers' perception of choices. Information on the web relies on both groups forming a common perception. In a global context, most web interfaces do not support effective usage as most of the information is presented on the web by icons, metaphors, shapes, colors of text and background, frame/text locations on screen, etc. which may be relevant to the culture of origin but may be misinterpreted by the global audience. Generally, web design features are directly translated into different languages at most and distributed to users internationally. In an international context, the web content features employed makes a somewhat lesser impact in the variety of contexts it is supposed to be effective in, although they may be clear to a minor proportion of the population. Thus a consideration of human factors in the design of web for an international user base is an important factor in promoting effective usage of information presentation.

## III. OBSERVATIONS



Development of web-information systems of today One of our basic assumptions was that web-applications are becoming increasingly business critical, and that this would be reflected in the organization of the development work. The Zyme project was an example of a web-application that was considered strategically important for the customer. It was a very large project and the customer required a thorough pre-analysis resulting in tender documents to ensure that different web-development companies could bet on the implementation. Furthermore, the deadline for version one was considered vital to the customer, and the site was considered the most important public relation activity. Thinking of IT as essential for public relation is new to most developers. The term 'branding' became important in the Zyme project. The designers and developers were informed that the sites should signal the attitude of the organization and high quality. These requirements must still be combined with the traditional requirements, such as informative, easy to use, quick to glance, etc. This was new to the actors, and obviously they had a very abstract and uncertain understanding of what it meant for their application. As one of the information architects phrased it: "One of the ideas is that the site should contain something with 'a kick' - you know - some energy! It is important for them [the customers] that this brand is pushed in the head of the user. One of our solutions will thus be that beside the main navigation there must be room for the system

to present interesting stuff from one of the sub-sites on the portal entry and thereby push information into the face of the users" (our translation).

### **3.1 New Competencies**

The main purpose of the Zyme project was to 'brand' the enzyme company (i.e. the customer) through the web-site. In the Zyme project terminology branding meant that the web-site should promote the enzyme company and signalize the company's values and high quality products. To achieve this and make all the traditional hardware and programming successful too require people with very different competencies in a project.

### **3.2 New Roles and Forms Of Collaboration**

We have encountered some of the challenges the different competencies create. The four groups of people in the Zyme project coordinated their work and collaborated with each other to develop the web-site. The information architects designed the functionality and information architecture and communicated it to the developers. The developers communicated the technical possibilities and limitations back to the information architects. Beside these four main groups of competencies a typical project in WebSystems included two project managers (one internal and one from the customer) and people from the quality assurance department. Apart from the groups mentioned the Zyme project also had actors from the server supplier and a marketing and advertising company involved. Furthermore there was a close interaction with domain experts from the customer. All these people were organized in small special groups and worked in the same physical place as the people from WebSystems

## **IV. WEB DESIGN AND CHALLENGES**

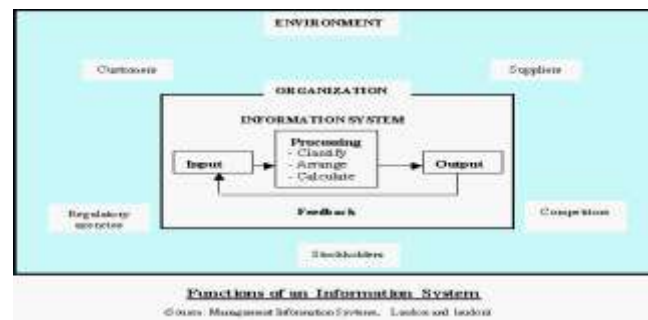
Challenges of web design are how to provide appropriate information to satisfy users, and give benefits to business providers. From the designer's view, providing a good interface possibly start with an understanding of customers' interests. The following two sections describe two aspects of web design that are important for customers.

### **4.1 Information On The Web:-**

Generally, customers are interested in information, representing style and interaction with web usage, depending on the quality of information. Sometimes, the amount of graphical components supports customers' understanding. Visual information on the web is increasingly important to support information as well as interaction between customers and business providers. Visual information promotes customer understanding, acceptance and determination to purchase products from the web. In global markets, users are sensitive to interaction with product information on the e-commerce sites. Del Galdo and Nielson [3] demonstrated that color and web page design directions have different psychological and social associations in different cultures. More importantly, different users have different concepts of web page usage. Design of web sites normally need to consider Latin-based screen design starting from the top left-hand corner or a Chinese language style starting from top right-hand to bottom left-hand. In such difference in script writing concepts, it is very difficult to provide localized screen designs if they are not included in the original design. Resources are currently available for web designers who wish to maximize the usability of a web site including usability guidelines. Collections of human factor references, web sites intended as a gateway to human factors resources and companies offering

web-focused human factors consultancy. Also Human Computer Interaction (HCI) theories, methods, techniques and tools may be applied to the study of computer-mediated communication (CMC) in general, and web sites in particular [1] [4].

## V. WEB DESIGN AND CULTURAL ISSUES



Web design is concerned with what a web site will look like and how it will communicate with customers [1]. The issue for IT professionals and researchers, business developers is to develop sufficient theories and models to describe behavior of humans who use information systems, with the aim of designing systems more effectively. Cultural factors in information systems are likely to impact on effectiveness through web design. A good web interface provides user satisfaction and conveys trust, such that a user can easily find general bearings of the information presentation scheme and retrieve the information they need. Design of web sites for effective performance is a complex and highly creative process. It combines intuition, experience, and careful consideration of numerous technical issues and investigations [2]. Moreover without proper consideration of cultural factors in design, the impact of culture is undermined and certainly does not position as an important issue. Culture influences certain methods of performing tasks, even common tasks in certain ways. Practices result from life long training of human and setrules and circumstances. Hence, localized e-commerce site deal with how differences between people from different cultures impact their behavior in specific circumstances. History and values can also impact on user's perception. E-commerce advocates have substantial claims made for the web's effectiveness as a tool in the sales process to customers. However, little real research has addressed these factors that will make customers buy, when in electronic shopping malls. Findings from cultural factors research for e-commerce could be beneficial for web developers catering for a domestic customerbase, as well as for an international market with the specific understanding of their culture and the human behavior it promotes. Particularly, understanding of designers' aspects from different countries through this study may add more value to web design in e-commercesites for the benefit of providers as well as customers.

## VI. CONCLUSION

The case studies described indicate that although the cultural background of customers and designers is very important for web design, current design practice takes minor account of cultural issues. Many global business web sites have been designed and developed with absence of understanding of customers and their cultural differences on the global scale. Customers' expectations are not taken into consideration in designing the functionality of web sites in global business companies. Apparently Australian web designers are

more customer-oriented in web design, in comparison to general global business web designers though they appear to be less sensitive to the use of graphics on the web. The web sites of leading Information Technology companies studied in this research did not have their interface to account for different user cultures. This research found that designers' approach from the two different countries were dissimilar for web design in electronic business applications. This study also concluded that there is a need for localized web interface design to transmit the meaning of a business concept on web sites in various locations. In addition, there is increasing attention to investigate ways to develop e-commerce sites for different countries. Future Electronic Business technologies will definitely introduce more attractive and convenient tools for the customers from different countries. Moreover, web image components are better suited to be used in certain ways to improve web-based e-commerce. Not surprisingly web images are being used a lot to attract customers and increase company's presence in the global e-commerce.

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