

Chapter 14

Identification of Critical Success Factors (CSF) and their Relative Importance for Web-Based Information Systems Development

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ABSTRACT

Today, a majority of information systems are being developed for Web environments. It is critical to understand the unique characteristics of Web-based information systems. The main objective of this study is to identify the relative importance of factors related to the development of Web-based information systems. To accomplish this, critical success factors (CSFs) for the development of Web-based applications were identified from the literature, and organized into two main dimensions and sub-dimensions. The relative importance of the dimensions was assessed through an analytical hierarchy process (AHP) method. Data were obtained in Korea from 33 experienced IT professionals representing six organizations from three different industry sectors. Respondents provided information about the relative importance of dimensions in pair-wise comparisons. As a result of the AHP analysis, information properties were found to be more important than risk control. Within information properties dimension, integrity of information was found to be the most important sub-dimension. The authors' analysis also revealed that there is an industry effect on the relative importance of the dimensions. The results appeared to be reasonable for each industry sector given its business characteristics and nature of customer interactions, contingent on industry sectors. Based on these results, a series of research questions are suggested for future studies.

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INTRODUCTION

Since 1990s, a majority of information systems are being developed in Web or Internet environments. The popularity and ubiquity of Web-based systems (Murugesan, Deshpande, Hansen, & Ginige, 2001) may be attributed to their advantages, such as user friendliness, convenience of access, and ease of administration. As a result, processes, methods, and techniques for information systems development are being dramatically transformed to suit Web-based systems (Davies, 2000; Howcroft & Carrol, 2000). These trends are well reflected in some buzz words in the current literature such as *Web engineering* (Escalona & Aragon, 2008), *requirements engineering for hypermedia and multi-media information systems* (Barry & Lang, 2001), *requirements engineering for Web applications* (Escalona & Koch, 2004), and *Web requirements* (Escalona & Aragon, 2008), which are a part of the Web-based information systems development milieu.

The extensive use of Web-based information systems has posed new challenges to researchers and practitioners, since traditional methodologies may be a poor fit for Web-based systems (Norton, 2001). Especially, in practice, the understanding of specific requirements for Web-based systems development is weak, and methodologies for Web-based applications are often ignored (Barry & Lang, 2001). On this issue, Murugesan and Ginige (2005) have observed that, “most Web application development still continues to be ad hoc, chaotic, failure prone and unsatisfactory” (p.2). These problems may be further magnified due to time pressures, whether the development is undertaken internally or externally through a vendor.

In response to these challenges, a group of researchers (e.g., Retschitzegger & Schwinger, 2000; Barry & Lang, 2001; Escalona, Torres, Mejias, Gutierrez, & Villadiego, 2007; Escalona & Aragon, 2008) have identified important gaps between the development of traditional and Web-

based information systems. Further, another group of researchers (e.g., Jiang & Klein, 2001; Hartman & Ashrafi, 2002) have investigated critical success factors for information system development projects in the Web environment. These efforts dealt mainly with managerial issues such as risk, cost, and time management in successful project management, rather than issues related to understanding Web-based systems development methodologies and/or software engineering. In other words, the following two questions are not clearly examined: 1) *what are the unique critical success factors (CSFs) that should be considered for Web-based information systems methodologies?* and 2) *what is the relative importance of these CSFs for Web-based information systems development methodologies?*

Based on these research questions, this article aims to identify the unique critical success factors (CSFs) for Web-based systems development efforts through a review and synthesis of the current academic and practitioner research. The relative importance of the identified CSFs was computed, based on an analysis of data obtained from 33 IT professionals in six Korean firms. The analytical hierarchical process (AHP) developed by Saaty (2005) was used to rank the identified CSFs. We believe that this study can help provide a better understanding of the requirements for Web-based systems development efforts. The main steps employed for ranking the CSFs for Web-based systems development are summarized in Figure 1.

WHAT ARE ‘WEB-BASED INFORMATION SYSTEMS’?

The term ‘Web-based information systems’ has been used in many prior studies and white papers. These systems are also referred to as hypermedia information systems, Web applications, and Internet-based information systems. Web-based information systems are defined as application

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