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Skills required in developing electronic commerce for small and medium enterprises: case based generalization approach

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Abstract

There has been a rapid growth in electronic commerce worldwide. However, the UK government and other governments had noted that electronic commerce uptake among Small and Medium Enterprises (SMEs) has been slow. In this paper we examine the skills and knowledge required for successful electronic commerce projects in the UK SME sector based upon detailed case studies in three SME organisations from the Northwest region of England over a two year period. B2C electronic commerce appears to involve a greater requirement for skills relating to website animation, website promotion, content management, and relevant legislation compared to B2B electronic commerce. Conversely, B2B electronic commerce potentially requires more detailed knowledge of electronic data interchange technologies compared to B2C electronic commerce.
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1. Introduction

The rapid growth in electronic commerce has been noted by many researchers [1–4]. The perceived strengthening of a company's competitive position may often be the justification for a company to develop electronic commerce [5]. Davies [6] had stated that e-commerce will become the accepted medium for business transactions, not least because governments are strongly promoting it. However, the UK government and other governments had noted that uptake of electronic commerce in the Small and Medium Enterprise (SME) sector has been slow [7–9]. It is therefore worthwhile to understand what skills and knowledge are required for successful electronic commerce development work [10], especially in the SME sector where such skills will typically be harder to obtain than in large organisations [7]. In particular it is important to examine how such skills and knowledge are used in actual practice in the SME sector, and to determine how such skills and knowledge can be improved in the sector. Seffah [11] had stated that in the face of a growing

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software industry labour shortage and rapidly changing technology, effective continuing education can help organisations develop and retain accomplished software developers. In this paper the results of a research exercise involving detailed case studies in three SME organisations from the Northwest region of England over a two-year period concerning the skills and knowledge required for electronic commerce development work in an SME setting are examined.

2. Literature review

2.1. Web-based development

Gellersen and Gaedke [12], Aoyama [13], and Russo and Graham [14] commented that the delivery of applications in the web-based environment is radically different from the usual ways of delivering software, and imposes a completely different structure and approach on application development. Quan et al. [15] commented upon the wide range of technical skills required for web-based application development. Niederst [16] had commented on the need for web designers to have an understanding of the human computer interface issues of website design including navigation, function and graphics, but had not examined how these skills were actually acquired or used. Wan and Chung [17] argued that website designers need to have navigational design skills, in order to avoid producing messy websites. Morris and Hinrichs [18] commented upon the new design skills required for web site design over traditional systems design skills such as an increased understanding of interaction and information handling, in particular navigation and pluralistic design. Pressman et al. [19] argued that as well as involving new design skills, web-based development projects also typically involve shorter development times and product life cycles. Palmer and Griffith [20] had commented upon the need for website designers to understand both the marketing and technical issues of website design. Conallen [21] had stated that since web-based applications execute business logic, the most important models of a web-based system should focus on the business logic, not on presentation details. Gellersen and Gaedke [12], Wiegers [22] and Russo and Graham [14] had stated that the development of web-based applications is still mostly ad hoc. Gellersen and Gaedke [12] also commented that there is no rigorous systematic approach to web development projects in general, and that most current web application development and management practices rely on the knowledge and experience of individual developers.

In summary, numerous researchers have commented that web-based systems development is quite different from other types of IT development work, however, the skills required to successfully undertake web-based systems development work in actual practice does not appear to have been examined in any detail.

2.2. Electronic commerce development

Korper and Ellis [2] had commented upon the wide range of technical skills necessary for electronic commerce projects including: network operating systems, back end systems, web servers, programming and graphical user interfaces. However, Korper and Ellis [2] had not discussed the use of such skills in actual commercial/industrial practice. Norris and West [23] argued that electronic commerce projects involve technical and business aspects, both of which need to be properly addressed in order for the project to be successful. Horowitz [24] had commented that for organisations wishing to utilise legacy systems for electronic commerce, migrating software to the World Wide Web requires a thorough understanding of systems architecture design principles in order to determine what will be executed on the client and server sides and what communication between client and server will occur. Norris [25] argued that since electronic commerce across the Internet transcends physical boundaries, it can make established legal and tax regimes difficult to apply, and electronic commerce system developers need to be aware of such difficulties.

In summary, numerous researchers have noted that electronic commerce systems development requires a wide range of skills to be conducted successfully, however, little research appears to

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