2003-01-01

Quality challenges in e-commerce websites

Ronan Fitzpatrick
Dublin Institute of Technology, ronan.fitzpatrick@comp.dit.ie

Quality Challenges in E-Commerce Web sites

Ronan Fitzpatrick

School of Computing,
Dublin Institute of Technology, Kevin Street, Dublin 8, Ireland.
Tel: +353 (1) 4024835, Fax: +353 (1) 4024985
Email: ronan.fitzpatrick@comp.dit.ie

1 Introduction

Total Quality Management has long been an objective of management and in the IT sector this has giving rise to research in areas such as customer relationship management (CRM) and total software quality. These areas of research are frequently interpreted to focus on Web sites and E-Commerce. The purpose of this paper is to contribute to the range of issues that influence effective E-Commerce Web sites through reference to software quality and Web site acquisition and use. Research shows that there are deficiencies in understanding and attitude to Web site usability, so, Section 2 considers some of the shortcomings in the understanding and practice of usability evaluation especially in the context of the WWW. Section 3 explains academic progress in research that has addressed these shortcomings. The philosophy of this progress is quality focused and it address the competitive advantage perspective of the Web site acquirer and the usability perspective of users. The research also includes a process for appraising commercial usability methods. Section 4 considers topics for future direction.

2 Deficiencies in the study and practice of web site usability evaluation

This section addresses two considerations relating to Web site external software quality, i.e., Web site usability.

First, research in this area in the main focuses on what users want for their ease-of-use, usefulness and entertainment (Loiacona *et al*. 2002) and seldom addresses Web sites for the competitive advantage of the Web site owner. Second, usability evaluation does not employ the same rigor as conventional software engineering practice. For example, metrics for measuring software quality factors are well understood by software engineering professionals, but metrics for usability factors are not as well defined. This becomes a greater problem when the evaluation is in the context of the WWW, where even the factors that constitute Web site quality are not yet defined. So, as part of a researcher's agenda the following challenges figure highly

1. Web site usability needs to be addressed as a strategic consideration from the Web site owner's perspective.
2. Web site usability evaluation would benefit from a quality focus in that it should be rooted in a quality philosophy.
3. An agreed set of Web site usability factors needs to be defined.
4. Web site usability metrics need be researched and understood.
5. Usability methods need to be re-defined and explained for use in a Web site context.

3 Academic progress

Items 1, 2 and 3 from the previous section have been the subject of publications and these are explained in this section.

3.1 Strategic driver perspectives

The growth and demands of E-Commerce are resulting in demands from software acquirers for Web sites that will support their competitive position. So, it is appropriate to review strategic considerations that influence software acquirers in order to determine a broader understanding of what actually contributes to their perspective of software quality. The *Software Quality – Strategic Driver Model* (*SQ_SDM*) explains

that the acquirer's perspective is driven by on Technical excellence, User acceptance, Corporate alignment, Statutory conformance, Investment efficiency and Competitive support (Fitzpatrick, 2000). While explained in the context of traditional IT systems these drivers can be easily interpreted for Web site owners. Additionally, aspects of them (e.g., Technical excellence and User acceptance) are easily interpreted for Web site visitors such that both parties in a B2C contract are considered.

3.2 Quality factors for the WWW

The research of Fitzpatrick and Higgins (1998) and Fitzpatrick (2000) provides a comprehensive listing of usability (External quality) factors appropriate to the WWW. Specifically relevant to the WWW are visibility, credibility, intelligibility, engagibility and differentiation. While all five are important to the visitor to the Web site and to the acquirer or owner of the Web site, the visitor is particularly supported by engagibility while the owner of the site gains competitive advantage through a differentiation strategy.

3.3 Metrics

Within the discipline of software engineering, product quality is assured through testing. This testing is well understood and follows a proven process of specifying what has to be tested, its timing during the life cycle, the methods to be used and the expected results. This is not the case in the context of the Web sites. The issues of "*what has to be tested*" are the usability factors per Section 3.2. From research observations, its timing during the life cycle appears to be mainly confined to evaluation after the site has been created. Similarly, the methods might benefit through classification and mapping to the life cycle. However, "*the expected results*" is a major challenge, as metrics for usability and especially in an E-Commerce context, are not well researched or well understood. While some metrics like Nielsen's 4 to 7 seconds for WWW response time is an accepted norm, similar types of metrics must be identified and defined.

It is easy to associate these metrics with users but there is also a need to consider metrics from a Web site owner's perspective too.

4 Future direction

Continuing research is addressing the methods used and in particular the relevance of acknowledged usability methods to Web sites. As part of this study Fitzpatrick and Dix (1999) published A Process for Appraising Commercial Usability Evaluation Methods. Current research is considering best usability practice and metrics to which results can be compared in both traditional IT systems and E-Commerce applications.

References

Fitzpatrick, R. and Higgins, C. (1998). Usable software and its attributes: A synthesis of software quality, European Community law and human-computer interaction, In: *People and Computers XIII. Proceedings of HCI'98 Conference*, Springer, London, UK

Fitzpatrick, R. and Dix, A. (1999) A Process for Appraising Commercial Usability Evaluation Methods, Human-Computer Interaction: Ergonomics and User Interfaces, *Proceedings of HCI International '99*, Munich, Lawrence Erlbaum Associates, New Jersey, USA

Fitzpatrick, R. (2000) Additional Quality Factors for the World Wide Web, *Proceedings of the Second World Congress for Software Quality*, Yokohama, Japan, Union of Japanese Scientists and Engineers (JUSE), Tokyo, Japan

Fitzpatrick, R. (2001) Strategic Drivers of Software Quality: Beyond external and internal software quality, *Second Asia-Pacific Conference on Quality Software, Proceedings of APAQS 2001*, Hong Kong; IEEE Computer Society Press, California, USA.

Loiacono, Eleanor, Watson, Richard and Goodhue, Dale, (2002) WebQual: A measure of website quality, *American Marketing Association*, Vol 13, p432/438

Nielsen, J (1996) *Top ten mistakes in Web design,* Jakob Nielsen's Alertbox.