

Chapter XI

Construction of Matrix and eMatrix for Mobile Development Methodologies

Norshuhada Shiratuddin

Universiti Utara Malaysia, Malaysia

Siti Mahfuzah Sarif

Universiti Utara Malaysia, Malaysia

ABSTRACT

Mobile computing is getting more and more attention these days, but the fact that there is still inadequate source of development methodologies to support mobile development, triggers the interest in this study to explore issues related to mobile development methodologies. The mobile developers are facing formidable challenges in the development of mobile application due to the specific demand and technical constraints of mobile environment. Selecting a suitable development methodology is believed to be the key answer to all these issues. Thus, this study aimed to propose a solution to resolve the issues. A decision matrix based on Pugh method was constructed to assist mobile developers especially the novices, to choose the methodology that suits the requirements of their mobile development projects. In order to rate the usefulness of the constructed matrix, an electronic version of the matrix was designed and developed, called m^d -Matrix. Detail descriptions of the processes involved in constructing the matrix and designing the electronic version of the constructed matrix are also described. Analysis of data gathered from a questionnaire given after the test of md -Matrix shows that participants fairly agreed that m^d -Matrix is useful in helping them to develop a mobile application.

INTRODUCTION

Charaf *et al.* (2006) described the mobile developer platform as still 'green'; with the developer culture as still budding. More over, the issue of comparing the performance quality of mobile applications to the wired applications is inevitable, which add to

the complexity of mobile computing environment. Thus, there is always an urge to produce high quality mobile applications, which almost is impossible to achieve without patterns and methods proven in the applications of the desktop developments. Under this perspective, a good methodology is believed to address the issues of producing a completely defined result in any development process.

During the development of a system the use of a methodology is important as a project can be structured into small, well defined activities where the sequence and interaction of these activities can be specified. The use of diagrammatic and other modeling techniques gives a more precise or structured definition that is understandable by both users and developers. The use of structured analysis requires a clear “requirements statement” that all parties can comprehend, and it provides firm foundation for subsequent design and implementation. Moreover, methodology also improves project planning and control, and provides a better quality system resulting in a better end product, a better development process and a standardized process (Avison & Fitzgerald, 1990).

Pastor and Whiddett (1996) agreed that the key challenge among system developers is during selection of suitable development methodology. The chosen methodology will have a huge impact on different aspects of development; for instance the cost, time, resources needed and etc. Development methodologies vary according to many areas such as the type of applications developed, the end users, the approach taken, the issues addressed and the diagram used. Thus, to select an appropriate methodology which perfectly fits the required purpose and field would be tough, especially to the novice developers. In order to address this issue, this research has taken a detail approach to construct a decision matrix by referring selected mobile development methodologies (MDM) against a number of development methodology properties. The selected development methodologies are meant to be representative but not exhaustive, and each has been identified to be mobile environment specific methodology. The findings of how this decision matrix really helps the novice developers are based on the testing of users’ perceived usefulness of the electronic version of the constructed decision matrix that is named as **m^d-Matrix**.

BACKGROUND

In this section we first present a discussion on the multimedia design approaches as they are closely related to the pertinent problem presented in this study. Then reviews of Mobile Multimedia Development and Pugh’s Decision Matrix are outlined.

Multimedia Design Approaches

According to a study by Augusteyn *et al.* (1998), a number of multimedia design approaches are available to designers; however, a completely integrated approach to multimedia design does not seem to be available. Current approaches generally relate to components of multimedia design, such as graphical design, rather than guiding the entire design process. The lack of fully integrated multimedia design methodologies can be attributed to a number of factors.

Firstly, multimedia designers are still independently working out how to do things, so they are not at the stage where they can document processes thoroughly (Augusteyn *et al.*, 1998). Secondly, multimedia is a multidisciplinary field that must incorporate aspects of methodologies from all of the contributing fields, such as graphical design, instructional design, sound production, software development, human factors and so on. Thirdly, multimedia design approaches are developed in either university environments or by commercial organizations. Communication between these two groups is generally very poor. Most industry-based multimedia developers are also not involved with universities, as a consequence, they do not hear about the latest findings, theories, and approaches. Finally, most commercial organizations do not publicize their methodologies. This means that less experienced multimedia designers cannot learn from the more experienced ones.

All these issues are now also faced by those who want to develop mobile applications (Bertini *et al.*, 2006; Heikkinen & Still, 2005; Atkinson & Olla, 2004; Heyes, 2002; Afonso *et al.*, 1998). Even though, mobile computing have gained a lot of attention both in research and industry over the last decade, but there is still inadequate research aimed to assist systems developers, particularly in the mobile environment., to select the most appropriate methodology for their development project (GI Dagstuhl Research Seminar, 2006).

Mobile Development Methodology

Presently, the mobile environment is offering only a handful source of methodology to support the development process of mobile application (GI Dagstuhl Research Seminar, 2006). Many developers claimed

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