Mobile Systems Development: Exploring the Fit of XP

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Abstract: Development of mobile software is surrounded by much uncertainty. Immature software platforms on mobile clients, a highly competitive market calling for innovation, efficiency and effectiveness in the development life cycle, and lacking end-user adoption are just some of the realities facing development teams in the mobile software industry. By taking a process view on development of mobile systems we seek to explore the strengths and limitations of eXtreme Programming (XP) in the context of mobile software development. Following an experimental approach a mobile systems development project running for four months is conducted. Experiences from the project are used for analysis and discussion of the fit of XP in mobile systems development. First, requirements for mobile systems development projects are proposed. Second, these are analysed and compared to the prescribed principles suggested in XP.

In general, we find XP well-suited for mobile systems development projects. However, based on our experiences and an analytical comparison we propose the following modifications to XP: Make an essential design to avoid the worst time waste during refactoring. For faster development, reuse code components whenever possible. Test regularly on real devices, since the difference between emulators and real devices are significant. Take advantage of spikes. Do not use pair programming when spiking, and remember to write unit tests for production code that was initially created during spikes. Monitor the user during acceptance tests.

Keywords: Mobile systems development, systems development, eXtreme Programming, XP

1 Introduction

Today most people carry around mobile devices, such as mobile phones, laptops, PDAs, etc. The market for mobile devices has been growing the last many years. In 2004 alone over 670 million mobile phones were sold worldwide (Gartner
2005). With this amount of people using mobile devices, developing software for these devices becomes increasingly interesting. This article focuses solely on software for mobile phones.

Currently there are a number of things that may be said to characterize software development for mobile devices – henceforth refereed to as mobile systems development (MSD). In this paper we take a closer look at the implications of common issues reflecting development of mobile software systems. These issues are: Rapid technology change, short time-to-market, high software quality, lacking end-user adoption, and immature software tools. Through the development of mobile application steered by the principles of eXtreme Programming (XP) we explore the pros and cons of an agile and product-driven approach to MSD – in this case XP. In addition, we suggest improvements to the principles of XP, increasing the fit of XP.

The paper is structured as follows: Section 2 describes the setting of the development project and briefly sketches the software application. In Section 3 a comparative fit is made between the requirements to MSD and the prescribed principles in XP. Section 4 discusses how to improve XP development method for enhancing the support for MSD, and Section 5 ends this paper with a conclusion.

2 Research Approach

This article is based on a MSD project that adheres to the XP principles described in ‘Extreme Programming Explained’ by Kent Beck (Beck 1999) and ‘Extreme Software Engineering’ by Steinberg and Palmer (Steinberg and Palmer 2004). The development project spans a 4 month period, where we effectively spend five weeks programming the software. These five weeks are divided into three iterations. The development team is comprised of six computer science students. The students are attending their sixth and eight semester at the University of Aalborg, respectively. The customer is a sixth semester Informatics student also from the University of Aalborg.

To document the development process we use a diary in which we each day write a short description of what project activity has been performed that day, and, most importantly, what has been experienced with regards to working with the XP principles. Each entry in the diary is written in the afternoon.

Diary writing is a qualitative data collection method that is useful when evaluating projects. It enables the diary writer to reflect upon his own actions and the development method that is used during a project. It also helps a team of developers to better understand the development method, and it makes it easier to remember the development process (Jepsen, Mathiassen et al. 1989; Patton 1990; Sá 2002). For creating and managing project diaries a simple web-based tool is applied.