

Chapter 2.12

Meeting the Demands of Wide Audience End Users

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ABSTRACT

This chapter identifies seven problems associated with requirements elicitation, where the intended users are external to the firm; it proposes characteristics for requirements elicitation methods to resolve the problems and tells the story of a new method that supports the resolution of six of the seven problems. Diverse, external users with little relationship to the organization present special problems for requirements elicitation. We identify seven problems for requirements elicitation with wide audience end users (WAEU): context, reach, modeling, model aggregation, presentation, consensus building, and the requirements-design interface. We also identify seven characteristics for requirements elicitation methods to support solutions for these problems. We develop the critical success chains (CSC) method to support six of the seven characteristics and demonstrate its use to develop applications for mobile financial services at Digia, Inc, a Helsinki-based software

development firm. Current research efforts are addressing the seventh problem.

INTRODUCTION

One of the key risks to the success of information systems (IS) projects is the failure to understand the functional requirements for the new systems (Lyytinen & Hirschheim, 1987). It is frequently claimed that the hardest single part of building a new IS is deciding precisely what features and functionality to build into the system, and no other part is as difficult to rectify later if it isn't done well (Brooks, 1975).

Requirements engineering (RE) is a process that involves all of the activities required to create and maintain system requirements that guide the information systems development work (Kotonya & Sommerville, 2002). Requirements elicitation is the initial phase in RE that focuses on collecting requirements of the would-be users. The tradi-

tional systems development view about requirements elicitation has been that requirements are out there somewhere to be gathered by the analysts (Kotonya & Sommerville, 2002). In this view, the problem of requirements elicitation is simply a matter of finding the right informants, using the right techniques, and then selecting, prioritizing, and agreeing on the requirements. Developers today face a variety of problems that make this traditional view less and less relevant.

More and more, end users are external to the developing organization, and would-be users are widely dispersed physically and geographically, making them difficult to reach (Tuunanen, 2003). Third-generation mobile software applications (Peffer, Gengler & Tuunanen, 2003) are typical examples. Such software is used by a very diverse set of users, some of them within the organization developing the software, but most in client organizations or with no connection to the developing organization. Understanding the needs of such users is a thorny problem (Salaway, 1987), and it is not made easier by the fact that many end users do not know how to express their needs (Walz, Elam & Curtis, 1993; Watson & Frolick, 1993). Consequently, it isn't easy to understand the needs of these users and exactly how to develop systems that meet those needs. Our objective is to develop research in order to develop methods for requirements elicitation to meet the needs of these users.

Here, we define a new type of system end user: the wide audience end user (WAEU). Many systems intended for WAEUs are emerging, such as embedded Java applications for 3G mobile phones or digital TVs for consumer markets. These systems are developed for end users who are not within an organization's reach, so traditional requirements elicitation methods are not well suited to support software engineers in approaching them. To understand the system requirements of WAEUs, we need to develop better ways to include them in the planning and development process. Otherwise, we risk facing problems that

are all too familiar to developers of innovative products: development prototypes show great promise in the lab and among product engineers, but they are rejected by the intended customers when introduced to the markets, because they are too difficult to use or miss the mark of meeting the users' needs and desires (Peffer et al., 2003; Peffer & Tuunanen, 2005).

KEY CHARACTERISTICS FOR WIDE AUDIENCE REQUIREMENTS ELICITATION

Reach and communication provide a useful starting point for understanding key characteristics of wide audience requirements elicitation (Tuunanen, 2003). We incorporate these two dimensions in our framework, as shown in Figure 1. This framework extends the work of Hickey and Davis (2003) and Nuseibeh and Easterbrook (2000) about requirements elicitation techniques and work on the communication aspects of elicitation (Curtis, Kellner & Over, 1992; Curtis, Krasner & Iscoe, 1988; Davidson, 2002; Keil & Carmel, 1995). The figure shows the three levels of reach, starting from the analyst-developer in the center and moving away from them to users that are successively harder to reach: user representatives, user groups, and the user community or WAEU. We use single- and two-directional arrows, suggesting the capabilities of categories for effective communication among the parties. This results in three proposed technique categories—group elicitation techniques, contextual techniques, and cognitive techniques—marked with question marks, because we think that techniques in these categories may be adapted to make them more effective for requirements elicitation with WAEU.

In our recent research (Peffer et al., 2003; Peffer & Tuunanen, 2005; Tuunanen, 2003; Tuunanen, Peffer & Gengler, 2004), we found seven distinct problems associated with requirements

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