Chapter 53
From Textual Analysis to Requirements Elicitation

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ABSTRACT

This chapter discusses the teaching of Requirements Engineering (RE) through a segmented approach. The idea is to teach this field, step by step, beginning with the requirements elicitation phase, which is the main focus of the chapter. The recommended linguistics-based method advocates the training of students in textual analysis techniques in order to develop their metacognitive and interpersonal skills, specifically, abstraction and comprehension. These skills are key soft skills for the practice of requirements elicitation.

INTRODUCTION

Most often the teaching of RE is reduced to its technical aspects and is therefore inefficient (Hanisch & Corbitt, 2004; Calelle & Makaroff, 2006; Danielsen, 2010). One of the reasons is that many soft skills which are important prerequisites in the RE process, and in the field of software engineering in general, are left aside (Chester 2011; Riemer 2007; Machanick 1998).Concerning the software engineering field, Jazayeri (2004) noted that:

A successful software engineer must possess a wide range of skills and talents.[…]; [he] must combine formal knowledge, good judgment and taste, experience, and ability to interact with and understand the needs of clients.

This is why many researchers (Machanick, 1998; Hanks, Knight, & Strunk, 2001; Hanisch & Corbitt, 2004; Hazzan & Kramer, 2007; Riemer, 2007; Burge & Wallace, 2008; Moràles, 2011; Reddy & Gopi,

2013) put emphasis on some non-technical skills, including metacognitive and interpersonal skills. These skills, which are considered essential by industry, should therefore be necessarily taken into account by Software Engineering trainers. It is necessary to point out that the teaching of non-technical aspects of RE, and more generally of soft skills in engineering, is difficult because there are no established methods that allow efficient development of all expected skills in a formal education framework. In this regard, Macaulay & Mylopolous (1995) have examined issues in RE education and they concluded that the teaching RE is inherently challenging:

Requirements are variously described by practitioners as 'intangible', 'moving targets, 'inherently inconsistent', 'ever-changing' and host of other adjectives which fill the average university lecturer with horror... In contrast to this, university courses normally have a prescribed syllabus and strive to provide students with a solid foundation of knowledge, which guide practice and will direct future learning. […] The educational dilemma in teaching RE is to provide the student with the solid foundation in the subject matter while at the same time exposing the student to the inherent uncertainties, inconsistencies and idiosyncrasies associated with real requirements problems.

In order to improve the training of students in RE, and taking into account the fact that RE is made up of a set of activities, we suggest to address the teaching of RE in a segmented manner, i.e. going step by step. This chapter focuses on the first step of RE, namely Requirements Elicitation and Analysis. We propose a Linguistics-based teaching method. It puts at our disposal a number of fundamental concepts and techniques for clients' needs analysis and for the production of requirements specification documents. We think that some relevant aspects of linguistics can provide students with a solid foundation of knowledge in the subject matter while at the same time exposing them to the inherent and unavoidable uncertainties, inconsistencies and idiosyncrasies associated with real requirements problems.

The first section of the chapter gives a synopsis of the RE teaching. It presents the educational challenges facing this field and identifies some of the teaching approaches already underway. The second section focuses on the structure and the content used for the training of students in non-technical skills useful for the practice of RE in general, and Requirements Elicitation in particular. By clarifying the terms "text" and "analysis," this section explains what textual analysis is, and presents its different approaches and the reasons why we think that it is an appropriate pedagogical tool for Requirements elicitation and analysis. The third section establishes a parallel between linguistics concepts and the skills needed for requirements elicitation and analysis and identifies seven key themes of linguistics which should be taught as theoretical foundation for the discipline. Section 4 presents an experimental syllabus which is currently used at University of Yaounde (Cameroon). Section 5 suggests future research directions within the domain of the topic.

SYNOPSIS OF THE TEACHING OF REQUIREMENTS ENGINEERING

Of the many definitions proposed to describe RE, this chapter adopts Zave's view (1997), echoed by Nuseibeh & Easterbrook (2003) and Shams-Ul-Arif, Khan, & Gahyyur (2010):

Requirements engineering is the branch of software engineering concerned with the real-world goals, for functions of, and constraints on the software systems. It is also concerned with the relationship of

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