

Assessing Requirements Compliance Scenarios in System Platform Subcontracting

Björn Regnell^{1,3}, Hans O. Olsson¹, and Staffan Mossberg²

¹ Sony Ericsson, Lund, Sweden

<http://www.sonyericsson.com>

² Ericsson, Lund, Sweden

<http://www.ericsson.com>

³ Lund University, Sweden

bjorn.regnell@telecom.lth.se

<http://serg.telecom.lth.se>

Abstract. In the mobile industry, system platforms are offered to device developers to enable rapid product development while sharing expensive technology development investments. This paper presents a framework for assessment of requirements engineering collaboration related to statements-of-compliance negotiation in platform subcontracting. The framework includes a classification of platform compliance scenarios and results from analysis of interviews with engineers at two collaborating companies, a device vendor and a platform vendor. Case study findings particular to the compliance scenarios of the framework are provided. The purpose of the framework is to provide a basis for process improvement in collaborative requirements engineering.

1 Introduction

Collaborative systems engineering and multi-partner development impose special opportunities and challenges [6]. A strategic combination of a number of specialised organisations, each with their specific expertise, can hopefully provide cheaper and more advanced products. However, the collaborative mode adds extra complexity to the development and special measures need to be taken to address barriers of communication [5]. This paper focuses on the assessment of a specific mode of collaboration: subcontracting of technical platforms in embedded systems development. Embedded systems are often based on a number of components such as real-time operating systems, special-purpose hardware, communication protocol software, and user interface software. These components are included in a system architecture that enable separate development of each component that communicate with other components through well-defined interfaces. Developments of specific components or architectural layers are often subcontracted, which impose the need for collaborative engineering between the integrator and the subcontractor [1].

The presented work is based on a case study in the domain of mobile devices. The mobile device industry is facing challenges of rapid technology development in combination with increasing market demands on expanding product portfolios targeting a wide scope of different capabilities and price ranges. Strategic alliances are formed among companies providing technology that can be reused among products to

increase productivity. Collaborative product line engineering where platforms are developed by subcontractors impose special challenges to requirements engineering compared to in-house platform development. At each platform release a contractual scheme needs to be set up, which often is based on statements of compliance representing agreed intentions by the subcontractor to deliver specific requirements in specified releases. Further work on challenges in this context can be found in [10], [11], [12].

This paper focuses on the assessment of the requirements negotiation outcome in collaborative requirements engineering, and the results of the presented work is a framework to be used in systematic analysis of compliance scenarios in order to find improvements for the future advancements of a collaborative requirements engineering process.

The paper is structured as follows. Section 2 provides a description of the industrial case under study, including an overview of the artefacts that are transferred in the collaborative engineering process. Section 3 gives an account of the research methodology applied. Section 4 presents the main result packaged in a compliance scenario framework. Section 5 concludes the paper.

2 The Industrial Case

This section provides an overview of the industrial case of the presented work. The domain is mobile device development and the products include a range of features related to communication, business applications and entertainment. The technological content is complex and includes advanced system engineering areas such as radio technology, memory technology, software design, communication protocols, security, audio & video, digital rights management, gaming etc.

As the investment of keeping up with the fast technology development is high, there is a market for providing *mobile platforms* that can be used by mobile handset vendors as a basis for rapid device and application development. A mobile platform typically offers ready-to-use capabilities of radio network access, communication protocols, local connectivity, multimedia encoding and decoding, encryption and decryption, and much more. These capabilities are implemented as an open-ended system of both hardware and software and the mobile platform is delivered as a *reference package design* including application specific integrated circuit (ASIC) designs and application programming interfaces (API), as well as documentation and test procedures.

The presented research case study involves two collaborating companies: a mobile device product company and a mobile platform product company. The collaboration is strategic and involves requirements engineering of mobile devices and the technology needed for future products. The two companies offer their respective products at different positions in the mobile industry value chain and they have different competitors and customers. Fig. 1 shows a simplified¹ overview of the actors in the mobile device domain with focus on the collaboration between the device product company and the platform product company.

¹ Many other actors such as network system providers, 3rd party application providers, standardization bodies, legislation authorities, manufacturing subcontracting, are not shown.