

Chapter 3

Viewpoint-Centred Methodology to Design Project/Subcontract Cooperation Policies

P.-J. Charrel^{1,2}, C. Thierry^{1,3}

¹*Université Toulouse 2 Le Mirail, Département de Mathématiques et Informatique, 5 Allée Antonio Machado, F-31058 Toulouse Cedex 9 France*

²*GRIMM-ISYCOM, Groupe de Recherche en Informatique et Mathématiques du Mirail/COMplex System Engineering Team*

³*ONERA-CERT, DCSD, 2 Av. Edouard Belin, BP 4025, F-31055 Toulouse Cedex 04 France*

Abstract

A methodology is presented to improve management projects which involve a project/subcontractor relationship and a shared resource. The project is viewed as an information system where the actors' main activity relies on accurate negotiation in order to succeed. The methodology is based (1) on the use of a discrete event-based simulator which takes into account features of a cooperation policy as an input, and (2) on a model of the negotiation. This model is built on the semiotic inspired notion of viewpoint which encompasses several essential features of the negotiation, and in particular: the actor, what the actor is interested in, and in what conditions. An algorithm is sketched to design a cooperation policy: It relies upon an iterated process that feeds and manages the simulator along the negotiation taking into account the viewpoint-centred analysis of the results of past simulations.

Keywords: viewpoint, methodology, cooperation, cooperation policy

3.1 Introduction

When facing a highly competitive market place, companies must focus on and be specialists in their core business. In such a context the number of suppliers and the number of subcontractors tends to increase. Then the realization of some strategic tasks is often ordered to specialized subcontractors [19]. The project managers thus aim at creating reliable partnerships, ideally within a strongly cooperative relationship. Suppliers and subcontractors should be motivated by a mutual interest in such cooperative attitudes. Unfortunately, the project decision-makers often lack tangible arguments. We have explored a pragmatic approach based upon the development of a simulator dedicated to the testing and evaluation of different cooperative decision-making strategies. In this chapter, we study the designing of a cooperation strategy: a semiotic-based notion of viewpoint is used to consider the cooperation strategy as part of the information system made up by the different actors of the cooperation who use the simulator.

After a state of art (section 3.2), we present our own analysis of the cooperative subcontracting relationship within a project supply chain and the simulator that has been built: the idea is to simulate and measure the performances of more or less cooperative policies (section 3.3). Then we sketch a viewpoint-centred methodology to design the cooperation policies (section 3.4).

3.2 State of Art

Project management literature refers to numerous methods presented in the field of project planning and scheduling: project scheduling in make-to-order organizations, deterministic scheduling with resource constraints, resource constrained project scheduling problem (RCPSP), etc. The reader should refer to surveys and reference books, e.g. [7–9, 21]. Nevertheless, project/subcontractor cooperation has not yet been widely studied. Yet, as far as the project is considered as part of a project supply chain collaboration, “... effective collaboration and information sharing are the prerequisites for project supply chain members to succeed” [14]. Due to complexity, most researchers have used qualitative analysis based on quantitative models and concepts drawn from manufacturing management and operation management literature [11–13, 20].

In the field of technological system design and business process improvement (software development process), “the development of complex systems