

Chapter 1

Using Problem Articulation Method to Assist Planning and Management of Complex Projects

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Abstract

The planning of complex projects involves organising infrastructure and resources, analysing stakeholders and their responsibilities, and defining deliverables. The outcomes of this process may impact strategically on the success of the project which should deliver business values. In this chapter, we describe a problem articulation method (PAM) applied in planning a major project of infrared atmospheric sounding interferometer (IASI) in CNES. The techniques of the method assist modelling the project by articulating the entire project into manageable units and linking these units with interconnected collateral relationships. The model can then further be used to analyse the requirements of each unit and its contribution to and impact on the entire project. The requirement specifications produced by this process can guide the detailing of project activities, budget, and resources allocation.

Keywords: project planning, project management, organisational semiotics, project planning requirements specifications

1.1 Introduction

Planning of complex projects is a challenging process that must ensure an alignment between requirements for the project development and

requirements for the project planning (Liu *et al.* 2002). It is thus imperative to establish a holistic view of all units of the project as well as interactions and communications between them. A large complex project requires an effective method for capturing the requirements of project planning in relation to policies, constraints, assumptions, and processes which should be transparent to all the stakeholders (Liu 2000). When there are changes in the project, the project management should be able to respond and adjust the change effectively towards the success of the project.

Complex projects tend to be late in completion, over budget, and often resulting in poor quality systems (Bounds 1998). Solutions to this problem have included the development of formal approaches to software process improvement (Herbsleb *et al.* 1994) and the application of formalised project management methods to plan, monitor, and control budget, time, and quality. Recent efforts have begun to integrate software process improvement methods with more generic project management methods (Pennypacker and Grant 2003). However, these methods are incapable of analysing the requirements prior to planning the operation of the project that may lead to limited understanding of the project and subsequently inadequate planning of the project. In order to avoid this type of risk, we apply problem articulation method (PAM) (Stamper and Kolkman 1991; Kolkman 1993; Stamper 2001) to assist project planning and management.

PAM is a method which articulates and decomposes complex problem situations into manageable units and their interconnected relationships. A focal unit system is referred to as the key objective to achieve while other unit systems serve as the infrastructure within the whole context. PAM is suitable for analysis and design of enterprise and IT applications (Stamper *et al.* 2004), which provides and facilitates cost-benefit analysis, project management, and project planning.

PAM is comprised of five techniques: unit systems definition, stakeholder analysis, collateral structuring, organisational containment, and valuation framing, which assist the process of articulation, analysis, and planning for projects. The technique of *unit systems definition* breaks down the complex project, as a problem situation, into manageable components which are defined as unit systems. One of the unit systems will be further considered as a focal system. The rest of the unit systems are considered as collateral systems, some of which provide services to the focal system. An important part of the analysis for the complex project is to describe stakeholders with their roles and responsibilities. The technique of *stakeholder*