

# Chapter 10

## Teams and Complexity: Merging Theories towards a Finite Structure

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### ABSTRACT

*The process of structuring teams in projects is not being implemented, and practitioners have lost confidence in the process. In order to improve the current status, there is a need for a major rethink, one that will enable the structuring of teams/complex adaptive systems. Therefore, using deductions drawn from research results, regarding the implementation of the process and the effects of complexity, a tentative proposal for a Finite Structural approach is made for setting up and testing the structure of teams. This is done by integrating a number of progressive theories not only from the field of organisation design but also from engineering, physics, and psychology, with theories such as social network theory, actor-network theory, finite element analysis, complexity, clustering, and cross functional team behaviours. This chapter presents the above and throws the gauntlet for discussion and improvement of the approach that will enable project managers and others to improve the process of structuring of teams.*

### INTRODUCTION

In the transient, complex and dynamic environment of construction projects (du Plessis & Cole, 2011; Antoniadis 2008) organisational design (structuring) of teams needs to be considered from the very early stages and for the duration of the project (Shirazi et al., 1996; Lansley, 1994). Various theories have been proposed throughout the decades and the benefits of the process have been described extensively (Slevin & Pinto, 2004; Courtney & Winch, 2003; Belbin, 2000; Turner,

1999; Newcombe et al., 1990). Also the importance of the process and the requirements for the implementation of a behavioural, as well as a transformational, approach was recognized in the early 80's by Applebaum (1982). The criticality and the level of implementation is also highlighted by been part of the measurement of the success of the project management outcome (Collins & Baccarini, 2004).

In terms of implementation a number of studies (Antoniadis, 2009; Green, 2006; Panas, 2006; Shirazi et al., 1996) indicate that still a subjective and transactional approach is taken. Recent results also point out that practitioners have lost their

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confidence in the process (Antoniadis, 2009), which when considered regarding its importance, as part of the project management outcome, it is a major issue.

Additionally, complexity affects project performance, through the process, and practitioners are not provided the necessary tools (Antoniadis, 2009) and although the latter has been addressed (Antoniadis, 2011b; ICCPM, 2011; Antoniadis, 2009) if the process is not improved there cannot be any progress.

From the above, but also as highlighted by McMillan (2002), there is a need for renewing our thinking on structuring teams.

In this chapter the author, considering that project management is ‘the management of transient, dynamic and complex adaptive systems/agents...’ (Antoniadis, 2009) and the issues raised regarding the process of structuring teams, will review existing and current thinking as well as theories and concepts from other fields and by merging these will propose a new approach. This will be done by integrating characteristics from a number of progressive theories, not only from the field of organisation design, but also from engineering, physics and psychology. Characteristics from theories such as Social Network Theory, Actor-Network Theory, Finite Element Analysis, complexity, clustering and cross functional team behaviours will be merged and a holistic methodology with its tool will be proposed. The new methodology - Finite Structure - will enable practitioners to design, test and implement organisational design of project teams (and not only).

The following sections will review the background of the areas investigation – structuring teams, complexity and research results which validate the concerns. Then look at a tapestry of theories and concepts which when considered could contribute positively to the process. The proposal for the Finite Structuring approach will follow, providing a detailed description of the new methodology and the tool that can support

its implementation. The chapter will close with the discussion, which will also list the challenges, and the conclusion.

## **BACKGROUND**

In this section a brief review of the literature in structuring project teams and complexity will be conducted in order to establish the background. This will be followed by a review of the research results and the outcome concerning both areas.

In the case of the literature regarding structuring project teams, together with the basic concepts of the process, some very recent ones will be described, whereas in the case of complexity, which is a more ‘current’ theory and even more so in projects, a more generic approach will be taken focusing on project issues.

### **Structuring Project Teams**

The theory of structuring organisations and teams has a rich background with authors such as Liker (2004), Handy (1993), Mintzberg (1979), Galbraith (1973), Sadler & Barry (1970) and Burns & Stalker (1961) on the general management side, and Moore (2002), Turner (1999), Shirazi et al. (1996), Lansley (1994) and Newcombe et al. (1990) on the project side providing detailed description of what is required, what should the structure look like and the best approach. Factors to be considered such as, technology (Thompson, 1967), contingency factors (Mintzberg, 1979), diffusion, codification of information and culture (Boisot, 1987) and Hofstede’s (1980) power distance and uncertainty model, have been highlighted and demonstrate the excessive demands when considering how to ‘put together a team’.

Interconnections or boundary regulation, project environment, integration and control also have been considered by Shirazi et al., (1996) and Lansley (1994) who suggested relevant types of

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