The Effect of Team Dynamics on Software Development Process Improvement

Rory V. O’Connor, Dublin City University, Ireland
Shuib Basri, Lero – The Irish Software Engineering Research Centre, Dublin City University, Ireland, and Universiti Teknologi PETRONAS, Malaysia

ABSTRACT

This article identifies the effect of team dynamics in the context of software development teams and its impact on software process improvement (SPI) activities in very small companies, in order to understand the relationship between these two variables. Most software development work is done by teams of software engineers working together in a collaborative manner to execute a software development process. Although there is much literature examining software process and how to improve it, less attention has been paid to the issues of team-working and specifically the impact of team dynamics on the software development process. Team dynamics is the term used to define how people work and interact together in teams. Teamwork is more effective with the existence of positive team dynamic, as it encourages a better working environment with satisfied, fulfilled employees who will in turn be more productive. This paper presents the results of a research study of team dynamics in very small software development companies and its impact on the software development process and software process improvement activities.

Keywords: Software Engineering, Software Process, Software Process Improvement, Team Dynamics, Teamwork

1. INTRODUCTION

A team is a collection of individuals who are inter-dependent in their tasks, who share responsibility for outcomes, who see themselves and who are see by others as an intact social entity embedded in one or more larger social systems (for example, a business unit or company), and who manage their relationships across organizational boundaries (Cohen & Bailey, 1997). The basis of every software development organization is a team, be it a management team, a development team, a trouble-shooting team or a testing team. Software/IT organizations are under more pressure than ever before to become more productive and more cost effective. The use of teams has been shown by Barnum (2000) to increase speed, productivity, problem-solving ability and organizational learning. Levi (2001) stated that a team is more than just a collection of people.

The foundations of the team and team dynamics are laid down during team-building. To
remain competitive, organizations must focus on forming and maintaining high-performing, successful teams. Beaver and Schiavone (2006) found that teams undergo the same four stages of evolution as follows:

- **Forming** - Where members get to know each other.
- **Storming** - Conflict and disagreement about rules and procedures.
- **Norming** - Establishment of rules and social relationships.
- **Performing** - Work, completion of task.

According to Rusher (1997) a team should not be viewed as the end product of a team-building activity. Instead she found that a team should be viewed as a dynamic entity, always changing in response to its circumstances and environment. She found that the team-building activity should be viewed merely as kicking off a process that should be continued when the team returns to its real-life work environment, otherwise the team would regress to its original state.

### 1.1. Team Dynamics

Social facilitation is the term used by Triplett (1898) to describe the fact that when people are working in the presence of others, this leads to an increase in productivity. Participation in a team should be of benefit to team members on both a personal and professional level. Katzenbach and Smith (1993) found that being a member of a team should help develop an individual’s social and interpersonal skills. Levi (2001) found that working on a team with individuals with different levels of expertise and skills should also help broaden an employee’s skills. When a team member feels that the task they have been assigned is compatible with their expertise and that the task is a worthwhile contribution to the team, this will lead to increased levels of self-worth and motivation. It is also important that each member of the team knows and understands their role and knows what the team expects from them.

Team dynamics is the term used to define how people work and interact together in teams. Team dynamics are the hidden strengths and weaknesses that operate in a team between different peoples or groups and they affect how a team reacts, behaves or performs and the effects of team dynamics are often very complex (Scarnati, 2001). There are various forces which could influence team dynamics including the nature of the task, the organizational context and team composition. The main team dynamics include:

- **Personal Development** - being a member of a team has a positive influence on personal learning and development, as most of us have the potential to learn the new skills required for a team because our sense of accountability to the team (Katzenbach & Smith, 1993).
- **Motivation** - Our level of motivation depends on how driven we are to achieve. For example, Ram (2003) found that having enthusiasm and motivation to work and learn new skills are just as important as having the required talents and skills. He found that this enthusiasm would inspire motivation in other team members.
- **Morale/Self-Worth** - Being a member of a team is beneficial to most people. Rushmer (1997) found that being a member of a team leads to a rise in self-awareness, self-appreciation, self-worth and self-confidence.
- **Empowerment** - Team members will feel empowered when they feel they have control over their work, their performance appraisal and their career path. Howard & Foster (1999) found that empowerment consists of a sense of self-determination, personal meaning, competence and perceived impact.
- **Commitment** - Teamwork cannot succeed without the commitment of every member of the team, commitment to both the team and the goals of the team. Jurison (1999) found that team members display commitment to the team by their sense of loyalty and dedication to the team as committed team members are willing to devote their...
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