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Full Length Research Paper

Need of competencies for handling software change

Ghosh SM^{1*}, Sharma HR² and Mohabay V³

Bhilai (CG) - INDIA

³Christain College of Engineering and Technology, Bhilai (CG) - INDIA

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Adapting changes in Software within organizational now recognized as a specific project type that can benefit from the application of Information Technology along with project management skills, tools and techniques. Changes in business process and operation trigger Software change implementation. Associated with this trend is evidence of a degree of rivalry in the marketplace between Project Managers and Change Managers concerning who should be managing business change. And these are not the only contenders. Corporate executives and senior managers, although they may engage the assistance of both Project Managers and Change Managers, generally see themselves as taking the leading roles in managing major organizational changes and transformations. As such endeavors are most likely to take the form of programs, comprising multiple projects across the organization; Program Managers are seen by some as being most likely to be responsible for managing organizational change initiatives. This paper reports on research undertaken to explore the differences in approach and practice of Project, Program and Change Managers as a basis for determining the competencies required to effectively manage change initiatives.

Keywords: Software, organizational, managers, executives

INTRODUCTION

In the post liberalization and opening up of the economy business era, ease in international trade barriers, economic liberalization, globalization, privatization, disinvestments and deregulation have thrown several challenges to Small and Medium-Sized Enterprises (SMEs) in the fast developing economies. Compressed product development cycles, cut throat domestic and global competition, economic downturns, rapidly

changing customer demands and volatile financial markets have all increased the pressure on SMEs to come up with effective and competitive capabilities to survive and succeed. SMEs sector had operated under a much-protected economic regime characterized by limited competition and a highly regulated business environment. This business atmosphere had resulted in limited focus on process efficiencies, centralized control structures, highly formalized business settings and lack of professional practices. However, following the economic liberalization and opening up of the economy to foreign Multi-National Companies (MNCs) provide SMEs a cutting edge over

*Corresponding Author's E-mail: samghosh06@rediffmail.com

its competitors. In the project management field, organizational changes, business process change and software change have become recognized as a distinct type of project or program (Partington, 1996) that has generated a growing research interest (Levene and Braganza, 1996; Crawford et al. 2003; Pellegrinelli, 1997; Leybourne, 2006; Bresnen, 2006; Lehtonen and Martinsuo, 2008; Nieminen and Lehtonen, 2008). In the field of change management, organizational change initiatives are often described as projects or programs and reference is made to use of project management skills, tools and techniques (Dover, 2003; Leybourne, 2006; Biedenbach and Söderholm, 2008; Oswick and Robertson, 2009). In the marketplace, there is evidence of a degree of rivalry between Project Managers and Change Managers concerning who should be managing business change. And these are not the only contenders. Corporate executives and senior managers, are generally the change owners, and although they may engage the assistance of both Project Managers and Change Managers, generally see themselves as taking the leading roles in major organizational changes and transformations. As such endeavours are most likely to take the form of programs, comprising multiple projects across the organization, Program Managers are seen by some as being most likely to be responsible for managing organizational change initiatives (Pellegrinelli et al. 2007). There is a popular view in the project management community that Project Managers are managers of change or change agents (Turner et al., 1996), but others (Partington et al. 2005) consider that projects or programs that require significant amounts of behavioural and organizational change, particularly those that might be characterized as involving 2nd order change (Levy & Merry, 1986; Gareis, 2009) demand high levels of interpersonal skill, astuteness and sensitivity and a fundamentally different approach to the candid, direct, and rational style valued in competent project managers. They also suggest that Project Managers, or Project Managers promoted to Program Manager roles are not always suited to the demands of organizational change projects. They need to learn skills and capabilities beyond those required to manage a typical project in order to drive change. In practice the role of the Change Manager has emerged from a different disciplinary background to that of Project Managers. Project management can be seen as having its origins in engineering with a focus on planning and control while organizational change as a discipline has grown from the Organizational Development field (Vaill, 1989) and places significant emphasis on the behavioral aspects of managing change. This leads to the recognition that there are two distinct bodies of knowledge underpinning the practices of the Project Manager and the Change Manager. The project

management body of knowledge is well defined in standards and guides produced by the project management professional associations. The field of organizational change and development is less well served in terms of professional and representative bodies (Hughes, 2007, p. 47) and practice standards but arguably much richer in terms of theoretical foundations. Consideration of both fields suggests that Change Managers coming from organizational development backgrounds may lack the technical and administrative discipline of project management, while Project Management qualifications offered by the professional associations and even the majority of academic institutions do not require Project Managers to demonstrate practice or underpinning knowledge in organizational development or behavioural aspects of change (Pellegrinelli, 2002). There is certainly evidence that poor management of human factors is associated with failure of organizational change projects (Buchanan and Boddy, 1992; Todnem, 2005; Luo et al. 2006; Maguire and Redman, 2007). The role and professional background of the person best suited to manage change is a topic of often-impassioned debate in the literature and in practice. There are many who believe that this role should be performed by the Project or Program Manager (Obeng, 1994; Turner et al., 1996; Pellegrinelli, 1997; Kliem et al., 1997). Other authors believe that the person managing change should come from a background which is less technical or project-based and more focused on behavioral science such as human resources, organizational development, and/or psychology (Kanter et al., 1992; Connor and Lake, 1994; French and Bell, 1999; Cummings and Worley, 2001; Caluwé and Vermaak, 2003). The OGC's *Managing Successful Programmes* (Office of Government Commerce (OGC), 2007) envisages that roles of both Programme Manager and Business Change Manager will be involved in the management of change initiatives. As mentioned earlier, Project and Program Managers' roles are well-established in literature, in practice, in academia and by professional bodies such as the Project Management Institute (PMI) and the International Project Management Association (IPMA). Change Management roles are not as clearly articulated. Job sites such as "My Career," "Monster," and "Seek" provide evidence of consistent demand for Change Managers, but role definition and support is considerably less well developed than it is in the project management field. Although a Change Management Institute (CMI), with global aspirations, was formed in Sydney in 2005 to meet "the professional development needs of Change Managers through the provision of networking, education and accreditation" (Change Management Institute, 2009), professional bodies for

change management are not as well established as they are for project management and there is very little literature support for specific change management roles. The change management literature focuses more on theories and processes of change than on the definition of roles of those involved in its implementation. Many actors, at different levels of the corporate hierarchy, are seen as involved in effecting organizational change. Reference is made to change leaders, change agents, change managers, change drivers, interim managers (Smid et al. 2006), organizational development consultants (French and Bell, 1999; Caluwé and Vermaak, 2003), as well as an “external consultant or internal project leader” (Jarrett, 2004, p.246; Jarrett, 2004). Although the use of projects to implement change (Biedenbach and Söderholm, 2008) and the need for project management skills (Nikolaou et al. 2007) are mentioned, the change management literature does not specifically identify a need for Project or Program Managers. This paper reports on research that aims to contribute to the emerging and very practical debate about choice of managers of change projects by examining the competencies required to manage change.

METHODOLOGY

There are two parts to this research study. First, the project and change management literatures have been reviewed to provide a comparative analysis of the competencies expected of Project, Program and Change Managers. Such a comparison provides a useful basis for determining whether Project and Program Managers can be expected to have the necessary competencies for management of organizational change. Having examined the literature, a similar comparison is conducted of practice across three case studies of organizational change projects. The case studies were carefully selected to provide practical insights into the relative roles and contributions of both Project / Program Managers and Change Managers in the implementation of organizational change. Taking a performance based view of competence (Heywood et al., 1992; Crawford, 2005) the activities undertaken by Project / Program Managers on the case study projects are compared with those of the Change Managers.

Comparative competencies from the literature

Crawford (2002) identified aspects of project manager competency by comparing the findings of a number of research based studies. Aspects of competency were grouped and then ranked according to the number of

times they were mentioned across eight studies. Those aspects receiving the least number of mentions were progressively grouped with the most directly related aspect receiving a higher number of mentions, and the aspects re-ranked. This procedure was conducted iteratively, resulting in the emergence of twenty four competency aspects encompassing knowledge, skills and personal attributes identified as important to effective project management performance. Results from Crawfords' (2002) study were updated and enhanced by inclusion of data from five additional studies and five standards including the ICB (International Project Management Association, 2006), APMBOK (APM, 2006), PMBOK ® Guide (PMI, 2004), GAPPS standards (GAPPS, 2007) and OGC Successful Delivery Skills Framework (Office of Government Commerce (OGC), 2004). The same analytical process was then applied to derive comparable sets of competencies for Program Managers and Change Managers. Results of the analysis are shown in Table 1.

Case studies

Three case studies of organizational change projects were studied in three different organizations. Both organizations and change projects were carefully chosen to provide as much control as possible over variation. The three organizations were of similar size but in three different industry sectors:

- A Steel and power company with 9,000 employees
- A Coal Industry with 12,000 employees
- A public university with 5000 employees

To have as much control as possible over the type of change project, its influence and its measurability, the change projects were also chosen based on a set of criteria:

Type of change: All change projects are an implementation of an organization wide IT system. These are the most common changes found in organizations today. All change projects may be considered 1st order changes as the overall identities of the parent organizations were not changed.

Number of influenced staff: Each organizational change has been implemented for a minimum of 1,000 people and a maximum of 3,000 people within the organization.

Project expenditure: cost for implementing each of these major technological implementations ranges from INR 20 lakhs to INR 2 crore. For all projects, the change had already taken place, the project or program had been completed, and the results of the change had been measured or could be estimated when the study was conducted. The change initiatives were chosen on the basis that there was successful implementation as perceived by the sponsor. A critical factor in choice was

that one was managed by a Change Manager, one by a Project Manager, and another by both a Change Manager and a Project Manager. For each project, semi-structured interviews were conducted with the leader/s of the change project, whether that was the Project Manager, the Change Manager, or both; the sponsor of the change initiative; three employees influenced by the organizational change; and a project team member (see Figure 1).

In practice, it was not possible to differentiate roles of Project and Program Manager as in these case studies the terms project and program were used interchangeably throughout the interviews. The term project was most commonly used. This is indicative of the pervasiveness of the term project, the less mature recognition and understanding of program and the questionable perception of program management roles as a progression from Project Manager in career terms as identified by Pellegrinelli et al.(2007).Semi-structured interviews were conducted, transcribed and then analyzed using grounded theory techniques (Strauss, 1998) with the aid of NVivo qualitative data analysis software.

DISCUSSION

From the literature, competencies expected of Project, Program and Change Managers were found to have similarities, although there were some differences as identified in Table 1.

In the case studies, however, greater differences were found between what Project /Program Managers and Change Managers actually do. The focus here is on change related activities (See Table 2). As noted above, it was not possible in the case studies to differentiate between Project and Program Managers as the interviewees used the terms interchangeably.

The review of the literature suggested a greater similarity between expected competencies of Project / Program Managers and Change Managers than was evidenced by the activities they carried out in practice. As indicated in Table 2, Project Managers focus on core Project Management activities and conduct few directly change management related activities. Similarities are in communication, stakeholder management and planning but in each case the focus of Project Managers and Change Managers is different. Change Managers use communication primarily to engage stakeholders, sell change, enlist champions, facilitate political diffusion and manage stakeholder expectations. Communications activities of Project Managers are primarily concerned with involvement in meetings, presentation of the project, and reporting particularly to sponsors. The focus of Change Managers

is more on engagement rather than management of stakeholders, taking a wide view of stakeholders with particular emphasis on users and those affected by change. Project Managers, on the other hand, are more comfortable with the concept of stakeholder management and although they may identify a wider range of stakeholders, their concern centers on team members and project interfaces. Change Managers focus on planning to effect and embed change. The primary concern of Project Managers is planning for the project.

The change management literature makes it clear that context is a major factor in determining the approach that should be taken which will in turn influence the competencies required. A major finding from the case studies in relation to context was that some organizational factors such as supportive culture and leadership assisted projects in achieving their goals although they did not completely eliminate the requirement for change management activities. For instance, in the Telco, with only a Project Manager and no dedicated change management resource, few change management related activities were undertaken by the Project Manager who focused on project management related activities. Team members and affected staff commented on this in interviews and noted that a greater focus on change management including communication would have been beneficial. However there was general agreement that the project was successful and this appears to be largely due to a shared view that the change was necessary, strong management leadership for the change and existence of a strong and well supported project management culture within the organization. This suggests that where there is a culture that recognizes the value of project management, good teamwork, low change resistance and strong leadership supporting the change it may succeed, regardless of the quality of change management activities. Factors that are influenced by the change project are the degree of behavioral change required and the extent of changes to the way people perform their jobs. These were influenced in the case studies using project engagements, communication, training, and process redesign.

Concepts of 1st and 2nd order change provide another lens through which to consider the roles and competencies required to manage change initiatives. 2nd order change, being "discontinuous, deep structural and cultural change" (Gareis, 2009) could be considered to require greater breadth and depth of change management competencies and activities.

Reflection on the findings of this study were distilled to produce a matrix to assist managers and practitioners in making decisions concerning the competencies required and the resourcing and management of change initiate

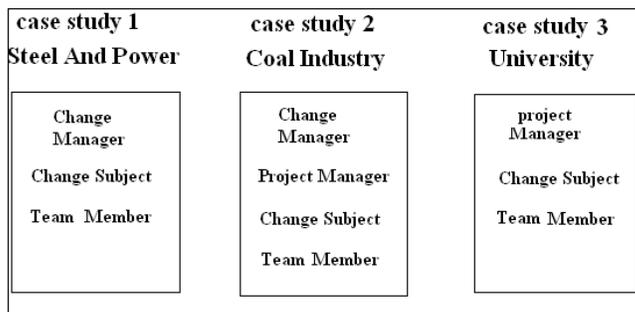


Figure 1. Participation structure

Table 1. Literature based Project, Program and Change Management competence across the three roles

Project Manager	Program Manager	Change Manager
Similar Competencies		
Leadership	Leadership	Leadership
Team Building	Team and resource development	Team Development
Stakeholder Management	Stakeholder Management	Stakeholder Management
Communication	Communication	Communication
	Cultural consideration	Cultural consideration
Decision Making		Decision Making
Project Planning	Project Planning	Project Planning
Governance	Governance	
Different Competencies		
Organization structure	Project Management	Assessment and analysis
Project Definition	Benefit Management	Challenge and creativity
Transaction Management		Coaching Skill
Change Control		Facilitation Skill
Closing		Presentation skill
		Action oriented

The two axes represent the key contextual factors found in this research to influence the intensity of change management activities required. A high degree of behavioral change and a weak supportive culture and leadership will require more intensive change management activities, highlighting the need for competent resources dedicated to change management. At the other end of the spectrum, if there is little behavioral change required and there is strongly supportive culture and leadership, then the change may be effectively managed by a Project Manager with some change management skills. Other scenarios would suggest Project Managers with varying degrees of change management competence and / or engagement of both a Project Manager and a Change Manager.

A key finding from the case studies is that, except in projects where there is very little behavioural change required, the Project / Program Manager will not have the time or bandwidth to carry out all the change management activities required to ensure a successful outcome. For relatively small scale change initiatives a

Change Manager with some project management skills may be an appropriate choice especially as project management skills are regularly identified as one of a number of competencies required in the Change Manager’s arsenal (Change management Institute, 2008). Nikolaou et al (2007, p. 298) claim that “a change agent must rely on skills from both project management and organizational development (OD)” and in their study of traits and skills of change agents found that only project management skills demonstrated a significant positive correlation with overall team performance, even when the effect of dispositional characteristics such as openness to experience, resilience, self efficacy, resistance to change, cognitive and affective attitudes and behavioural tendencies were taken into account (p. 306).

In this study we have focused on performance based competencies that are evidenced by what is done in the workplace, rather than personal competencies. The change management literature strongly emphasizes the importance of personal competencies to effective

change management. It may be assumed that not all Project and Program Managers are dispositionally suited to management of change, although the findings of Nikolaou et al. (2007) supported by others such as Bruch et al. (2005), reporting on strategic change implementation at Lufthansa, and Leybourne (2006) relating to project-managed implementation of strategic change in the UK financial services sector, provide some confidence that change initiatives will generally benefit from some form of project management.

A guide for project / program and change management competencies and activities

In this study both literature and empirical research were utilized to provide a guide to the competencies required and activities to be undertaken by a Project / Program Manager and Change Managers to successfully implement change on change projects. Table 3 below summarizes the change management competencies that were found in literature across the roles of the Project / Program Manager and the Change Manager. These competencies, according to literature, are those needed by Project / Program and Change Managers to implement change successfully as part of a change project. Table 3 presents the change management activities that were undertaken by the Change Managers on the case study change projects. These findings are consistent with guidance from the change management literature.

In summary, in order for an individual, whether Project / Program or Change Manager, to successfully implement change into organizations, he or she should possess all the competencies listed in Table 2 common across the roles and summarized in column one of Table 3 below. They must also be able to perform, or ensure performance of the activities listed in column two of Table 3, as they are directly related to proven achievement of successful change.

CONCLUSION

The goal of this study was to investigate the relative roles of Project / Program Managers and Change Managers on organizational change projects and the contextual factors that might affect the change management competencies required, the change activities that need to be undertaken, and the most appropriate professional background to manage the process. Analysis of literature and rich data drawn from carefully selected case studies has contributed to theoretical and practical understanding of the phenomenon and provides a sound basis for future

research testing the findings in other settings and with different methodologies. In this study, the types of change projects were all IT implementations conducted in different types of organizations. This is an important limitation of the study. Although findings have support from the literature and provide useful guidance for further research, they lack generalisability and recommendations should be treated with caution. Studies of different types of organizational change would be a useful further progression of this research. Categorization of 1st and 2nd order change, as discussed by Gareis (2009) could provide a useful framework for such studies.

The organizational factors identified as significant in this research were specific to those the three cases studied. There are many other factors in organizations that influence or are influenced by organizational change projects. It would be worthwhile investigating organizational /contextual factors in greater depth, perhaps investigating each factor separately. A study such as this would contribute greatly to the understanding of how contextual factors influence the competencies required to effectively implement change.

This study has implications for both the theory of project management and change management. From a theoretical perspective, this study brings together two largely disparate fields that operate within the same organizational territory, that is, the management of change. The two fields are project / program management and change management, a field which has evolved from organizational development and human resources practices. In practice, there is often competition between Project / Program Manager and Change Managers for the management role on organizational change projects but this study has demonstrated that there is opportunity for a fruitful partnership. From a theoretical perspective, change management can be seen as theory-rich while the role of the Change Manager is weakly supported in terms of professional formation. The project / program management field is generally considered to be theory-poor, while the roles of Project and Program Manager are very well supported by professional bodies, standards, and certification processes. This suggests a fruitful opportunity for partnership not only in the management of organizational change projects, but in theoretical and professional development. Another contribution of this study is in testing the claims of Project and Program Managers as implementers of change. According to this study, and in contradiction to many papers and books written to date on the matter, Project and Program Managers do not necessarily have the required competence or perform the full activities required to promote and implement the changes that they are leading as part of their projects. Although many

Table 2. Similar and different activity

Project/Program Manager	Change Manager
Similar Change related Activity	
Communicating : Organize presentation, represent the project in team meeting, and report to the sponsors	Communicating with stake holders and managing their expectation
Stake holders management	Stake holders management
Planning	Change management planning
Different activities	
Manage resource, people , budget , schedule, risk	Changing behavior and organization culture to achieve the goal
Team Development	Prepare of user
System assessment	Organization structure
Issue resolution	Impact analysis
Strategic decision	Champion scheme
Project closing from project to operational	Training and education to effected personnel

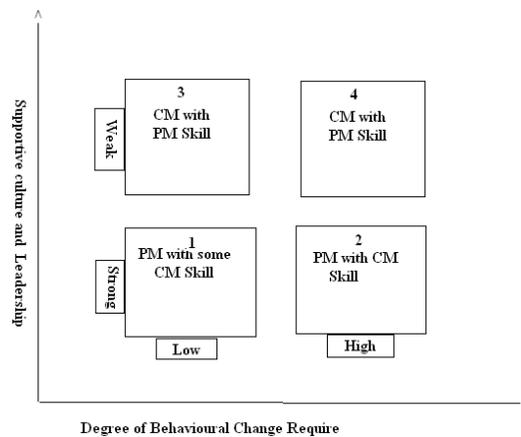


Figure 2. Suggested Decision Matrix for Project Management and Change Management

authors suggest that Project and Program Managers are implementers of change, the case studies analyzed do not support this when compared to Change Managers. The findings of this research have potential to contribute to curriculum and educational development for Project and Program Managers.

In a practical sense, as a result of this study, a set of change management competencies, change related activities and a matrix to assist in decisions about appointment of a Project Manager or Change Manager or both for organizational change projects have been presented. Results support the already well-practiced use of a Change Manager in the management of change and enhance understanding of how the Project / Program Manager and Change Manager relate to one another on change projects. In recruitment for organizational change projects there needs to be consideration for the management of the change and the person who will drive the changes into the organization

beyond the daily tasks of managing the Project /Program, performed by the Project / Program Managers. The implications of having this additional role are in changes to the way projects are run, including their governance, reports, and all other project activities as well as the development of new project activities which are change management-specific.

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