Agile Project Management

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ABSTRACT: In this paper, project management maturity model (ProMMM) has been used to evaluate the effectiveness of project management and to determine the maturity level of organization. The aim of this paper is to show the relationship between each four factors of culture, process, work experience and application of ProMMM and effectiveness of project management (EPM). Also, the influence of demographic characteristics is investigated. On the basis of a structured questionnaire distributed among 72 members of projects in one branch of a big project organization located in Tehran, Iran, the success factors of an effective project management are analyzed. As a result, most team members agreed on establishing a systematic project management by informing the benefits of project management to managers and employees, attracting support of top managers, improving project team members’ skills, building formal project management processes and dedicating required human and material resources to project teams. Future research should include large-scale surveys to systematically analyze the causalities of successful project management in different types of projects, organizations, and industries. Further research could help extracting other effective factors influencing the effectiveness of project management.

Keywords: project management, the project management maturity model, effectiveness of project management, capability assessment

INTRODUCTION

The business landscape is fast-paced and competitive, and product lifecycles are shorter. This emphasis on speed, forces teams to make quick decisions with incomplete information or in an environment of uncertainty. This, in turn, leads to frequent changes in project management requirements and direction (Chin, 2004). A shift in perspective is taking place from considering projects as exceptional cases to account for projects as regular business processes creating value (Winch, 2000). Therefore, we need to view projects as the business, or at least the core part of the business. Many businesses recognize project management as a core competence and seek to deliver benefits to the business through effective management of projects. So a project manager should know how to fully integrate project with the business strategy, other related projects, and key optional activities to be able to respond to the fast-changing business environment of the contemporary markets (Vandaie, 2008). Effective project managers are required to have both technical skills to help control the iron triangle of time, cost and functional scope as well as communication skills to work effectively with people and get the best out of them (Bourne and Walker, 2004). But how can an organization know whether its project management processes are effective? The Project Management Maturity Model (ProMMM) has been developed to meet this need. (David Hillson, 2003)

There are three main factors making the project management necessary, project uncertainty as the main factor, unique expertise, and speed. Both internal and external uncertainty should be considered. Internal
uncertainty refers to those things inside the project that can be more or less controlled by the project manager, including scope, schedule, and the cost. External uncertainty involves those factors not under the project umbrella, such as the competition. Sometimes a project requires a specific expertise. By expertise, it means a person with high technical or conceptual skills. Speed, as a multiplying factor, is the third factor. Companies working in an environment with high level of competition, certainly have some urgency to execute projects faster. Speed is one tool to fight off competitors (Chin, 2004). Frequent changes in project requirements and direction make teams to be light in their feet and agile. The term agility refers to the ability of an enterprise to develop and exploit its inter- and intra-organizational capabilities to successfully compete in an uncertain and unpredictable business environment (Hooper, Steeple and Winters, 2001). Agility attained through the mix if innovative managers, skilled and empowered people and adaptive, current technology to produce quality goods and services (Crocitto, Youssef, 2003).

The following sections will introduce the concept of project management and describe the main factors affecting project management in an organization. Next, the Project Management Maturity Model (ProMMM) of David Hillson is described. At the end, the influence of demographic characteristics on EPM, the maturity level of Organizational project management (by ProMMM) and the relationship between four factors of ProMMM and effectiveness of project management are analyzed and the results are discussed. On the basis of the results, avenues for further research are finally derived.

PROJECT MANAGEMENT

Project management (PM) is no longer just an academic exercise; it rather needs to be regarded as a set of theories, principles, methodologies and tactical practices that will help organizations reach their goals (Vidal and Marle, 2008). The essence of successful project management is a positive and determined attitude towards setting, maintaining and eventually achieving firmly set objectives, with action taken wherever necessary to keep the project on its planned course (Lock, 2003, p. 58). In the 1980s, managers concentrated on enhancing competitiveness by improving their operating efficiencies. They cut costs, eliminated waste, downsized, and outsourced. In contrast, in the year 2000 and beyond, agile project management model based on individual and corporate motivation is of higher importance. (Owusu, 1999) Today, a cohesive team is, very possibly, the key success and failure factor in the agile environment. The point is that, most people understand the nature of projects and how they are managed and this can lead to the mistaken assumption that they are easy to manage. (Eddie Kilkelly, 2009)

MAIN OBJECTIVES OF AN EFFECTIVE PROJECT MANAGEMENT

According to Bastian Hanisch research in 2009, apart from cutting costs, five other objectives of project management were stated (summarized in table 1): increasing work efficiency and reducing risk by codifying the knowledge and the experience gained through other projects and applying them in new projects. A continuous learning process throughout the overall project allows to constantly improve and develop the processes on a regular basis and also to avoid repeating mistakes, which might be part of the experience of previous projects. Continuous improvement is also stated as main goal in terms of methods and standards connected to project management. Another aim is the proper staffing of projects according to competences and expert knowledge of project workers. It requires a keen focus on understanding the value of each employee hired from both a quantity and a quality perspective. The fifth goal is the identification and fostering of innovation. Project knowledge management positively affected innovation and responsiveness to knowledge positively affected performance (Darroch, 2005).
Table 1: summary of PM objectives

<table>
<thead>
<tr>
<th>Avoiding duplication of work</th>
<th>Learning by repetition</th>
<th>Promoting innovation</th>
<th>Harmonizing of methods/standardizing</th>
<th>Allocating resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reuse of previously acquired knowledge</td>
<td>- Continuous improvement of processes and products</td>
<td>Identification and application of innovative ideas using the potential of interdisciplinary collaboration</td>
<td>- Identification of best practices and transfer in company standards</td>
<td>Optimal staffing of projects with regard to capacity and competence of employees</td>
</tr>
<tr>
<td>- Facilitating access to information (methods, processes, contact persons)</td>
<td>- Avoiding repetition of mistakes</td>
<td></td>
<td>- Establishment of and support through routines</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Creation of safety in procedures</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Consistent terminology</td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
— The culture of the Level 2 Novice project management organization is not fully convinced of the benefits of project management and tends to see it as a necessary overhead. Processes are rather ad hoc, and their effectiveness depends on the limited experience of a few key individuals who may have little formal training. Project management application is inconsistent and patchy.

— Level 3 project management organizations have Normalized project management into their way of operating, with a culture that recognizes the value of projects and expects to reap benefits from managing them. Generic and formal processes are in place, with the necessary resources available, and staffs have adequate experience and expertise to undertake effective project management. Application is routine and consistent across all projects.

— At Level 4 Natural, a project-based culture drives the organization into proactive project management, seeking to gain the full advantages of the changing business environment. Best practice processes are implemented at all levels of the business, with regular updating and active learning from previous projects. All staffs have a degree of experience of using project management processes to assist their tasks, and application is widespread and second-nature across all areas.

THE QUESTION AND HYPOTHESES OF THE CURRENT STUDY ARE (Fig. 1):

- **Q #1**: Do the demography characteristics influence the evaluation of effectiveness of project management?
  - **H1**: There is significant relationship between gender and the effectiveness of project management.
  - **H2**: There is no significant relation between age and the effectiveness of project management.
  - **H3**: There is significant relation between education and the effectiveness of project management.

The findings of the current research may be used to offer potential project management strategies to enhance the effectiveness of project management.

![Conceptual Model of the Research](image1)

![Demographic characteristics data](image2)
• Q #2: what is the position of the organization within the ProMMM framework? (Naive, Novice, Normalized or Natural project management organization)

**Research Main Hypotheses:**
- **H1:** There is a significant relationship between culture¹ and effectiveness of project management.
- **H2:** There is a significant relation between process² and effectiveness of project management.
- **H3:** There is a significant relation between work experience³ and effectiveness of project management.
- **H4:** There is a significant relation between application⁴ and effectiveness of project management.

¹ Culture is the way staffs think, including values, believes and ethos
² Process is the way staffs do things, including tools, methods and techniques required to an effective project management.
³ Experience is what staffs know and can apply.
⁴ Application is a set of tools, resources, reports … required to perform project management. (David Hillson, 2003)

The findings of the current study may be used to offer top managers in organizations to establish a systematic project management by informing the benefits of project management to managers and employees, improving project team members’ skills, building formal project management processes and dedicating required human and material resources to project teams

**RESEARCH APPROACH AND METHODOLOGY**

2.1. Sample and Procedure
The present study was conducted on a sample of 72 experts in different project teams in different project teams in MAPNA #1, a big project organization located in Tehran/ Iran. Data were gathered by a structured questionnaire in September 2011.

2.2. Questionnaire
ProMMM provides four key attributes against which organizational project management capability can be assessed. Key attributes of project management questionnaire consists of 21 questions in four categories extracted from Hillson’s model (2003) (Fig. 2): Culture, Process, Application and Work Experience. And the effectiveness of project management questionnaire consists of 10 questions extracted from Hanisch’s model. The possible responses were a five scale Likert from (1) I absolutely agree to (5) I absolutely disagree (Number 3 was neither agree nor disagree).

2.3. Statistical Analysis
A total of 72 questionnaires were included in the final analysis by SPSS. Although the standard questionnaire was used, the Cronbach’s Alpha of the questionnaire was also calculated (0.941). To systematically examine the relationship between four success factors (culture, process, experience and application) and project
management performance, Pearson Regression was used. The profile of the respondents is shown in Table 1. The analysis of influence of the influence of demographic characteristics on evaluating effectiveness of project management is shown in Table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>51</td>
<td>70.83</td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td>29.16</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 to 30</td>
<td>20</td>
<td>27.77</td>
</tr>
<tr>
<td>31 to 50</td>
<td>49</td>
<td>68.05</td>
</tr>
<tr>
<td>&gt;51</td>
<td>3</td>
<td>4.16</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate  and less</td>
<td>49</td>
<td>68.1</td>
</tr>
<tr>
<td>Graduate upper</td>
<td>23</td>
<td>31.9</td>
</tr>
</tbody>
</table>

Findings and Discussion

As it is shown in Table 2, majority of respondents are male, between 31-50 years old with undergraduate certificate. Considering confidence interval as 95%, age was investigated using a one-way analysis of variance (ANOVA) from which a Scheffe multiple comparison test was computed to pinpoint groups whose means were significantly different. An independent samples test was used for gender and education.

3.1. Gender

Analysis revealed a significant relation between gender and evaluation of effectiveness of project management (Sig<0.05). It means that women and men have different points of view in evaluating main factors of effectiveness of project management. In a study among industrial workers, the same results were reported stating that there is a significant relation between the gender of the staff and their evaluation [22].

<table>
<thead>
<tr>
<th>demographic characteristics</th>
<th>Test</th>
<th>Sig.</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Independent Samples T Test</td>
<td>.001</td>
<td>% 95</td>
</tr>
<tr>
<td>Age</td>
<td>ANOVA</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Independent Samples T Test</td>
<td>.098</td>
<td></td>
</tr>
</tbody>
</table>

3.2. Age

No significant relation is found between age and evaluation of effectiveness of project management (Sig>0.05). It means age is not an effective characteristic in evaluating effectiveness of project management. In an earlier research in an IT workforce in five companies, no significant relation was found between gender and QWL [20].

3.3. Education

No significant relation is found between age and evaluation of effectiveness of project management (Sig>0.05). It means education is not an effective characteristic in evaluating effectiveness of project
management. Hossain [22] investigated the relationship between QWL and work experience among industrial workers in Bangladesh and found a positive correlation between work experience and QWL.

Table 3: Effectiveness of project management level

<table>
<thead>
<tr>
<th></th>
<th>Valid</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>72</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>38.51</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>5.68</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>22.00</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>48.00</td>
<td></td>
</tr>
</tbody>
</table>

RESULTS OF HYPOTHESES ANALYSIS

This section illustrates the findings of a study on Organizational Project Management. The results show that there are strong significant relationships between effectiveness of project management and culture, process, experience and application (Table 3). The observations are based on a structured questionnaire distributed among 72 members of projects in a project organization. David Bryde [1] in a study in UK organizations, support the assumptions that Culture, Process, Application and Experience influence the effectiveness of organizational project management. Cicmil [1] and Hanisch [1] investigated the relationship between culture and effectiveness of project management, and found a positive correlation between culture and EPM. Consulting with 500 clients in a variety of industries by Longman and Mullins [1], the same results were reported stating that there is a significant relation between the Culture, Process, Application and Experience influence the effectiveness of organizational project management. Even the best IT systems and methodologies for supporting the storage and dispersion of knowledge gained in projects are useless if there were no visible support from senior management (executives) and a corporate culture that encourages release of information. (Serge Garon 2006) Therefore, a supportive corporate culture in the sense of enhancing interdisciplinary cooperation and knowledge exchange in geographic distribution of project teams, project-based business processes, regular external training to enhance skills, development of specific resources, application and tools are all necessary for having an effective project management.

Fig. 4: Effectiveness of project management among project team members
Table 4: Results of the Hypotheses of the Research

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Sig.</th>
<th>r</th>
<th>dependent variable</th>
<th>Independent variable</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1</td>
<td>0.00</td>
<td>%60.7</td>
<td>EPM</td>
<td>Culture</td>
<td></td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>0.00</td>
<td>%73.8</td>
<td>EPM</td>
<td>Process</td>
<td></td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>0.00</td>
<td>%86.2</td>
<td>EPM</td>
<td>Work Experience</td>
<td></td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td>0.00</td>
<td>%91.9</td>
<td>EPM</td>
<td>Application</td>
<td></td>
</tr>
</tbody>
</table>

The findings of this study strongly support the assumptions that Culture, Process, Application and Experience influence the effectiveness of organizational project management.

**INTERPRETATION OF ProMMM RESULTS**

To calculate and analyze maturity level of organization by ProMMM attribute (Culture, Process, Experience, and Application), each possible responses of each question can get a score from a five scale score 1-5. The mean score is calculated for each group of questions of each attribute, with standard deviations showing the degree of agreement between respondents. The ProMMM levels for each attribute are determined by rounding the mean score to the nearest decimal place, and the overall ProMMM level is calculated as the average of all four attributes. Results are presented as a radar plot of the four attributes, as well as numerical values of attribute scores and overall ProMMM level, as shown in Figure 2. by ProMMM framework analysis, strengths and weaknesses in current project management capability are determined. It also describes four levels for project management capability, named Naive, Novice, Normalized and Natural.

![Figure 5: ProMMM radar plot](image-url)
Based on analysis of the ProMMM, the organizational ProMMM Level is rated 3.7, representing a ‘Normalized’ project management organization. The scores of attribute were:
- Culture 3.8
- Process 3.5
- Experience 4
- Application 3.4

High scores for all four attribute indicate that, this organization has the required fundamental, principles and project-based business processes for effective project management. Most team members try to learn from previous experience and there is regular external training to enhance their skills. Right tools and methods are applied. Furthermore, top managers have created top-down commitment to project management and encourage staffs to support project managers by rewards.

4. Further Research

In this study, the relation between culture, process, work experience and application with EPM were investigated. Furthermore, the influence of demographic characteristics such as gender, age and education were examined. The results are based on a small sample of 72 questionnaires and should be considered as a starting point for further research only. Furthermore, other possible influences on organizational project management must be considered. Future researches should include other salient variables and also examine more complex interactions of EPM with demographic characteristics and other variables among project team members. Another point of interest might be the comparison of the study’s findings to research conducted in the non-profit sector. More empirical research in the field of PM is needed in order to further determine and evaluate organizational interdependencies and alternative approaches to a successful project management. In particular, a large-scale survey will be necessary to analyze causalities of EPM.

References

Eddie Kilikelly (2009), “Blended learning: pathways to effective project management”, DEVELOPMENT AND LEARNING IN ORGANIZATIONS, VOL. 23 NO. 1, pp. 19-21


