

Leadership Tasks in Software Project

Advanced Software Project Management- PA2513

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I. ABSTRACT

This document takes its go so as to address the structuring and the profile of the team when a software development project is considered. Characteristics of the of the employees and portraying the profile of the team leader along with all the rationales possible is the goal of this document. An optimal solution is presented after taking through different traits of leadership and theories of motivation.

Keywords: Leadership, Team Selection, Team management

II. INTRODUCTION

Leadership has been constantly evolving and the definitions of a leader, have been changing over the course of time. Warren Bennis has defined leadership as “*as weather shapes mountains, so problems make leaders*” [1]. John F Gardner has been an iconic figure and a teacher throughout his life [2]. When it comes to leadership, he has defined that an ideal leader has two tasks that sets the leader apart from the crowd by a huge margin. He addressed the two tasks to be the asserting vision and providing solutions to the problems that are existing [3]. Now, leadership in software sectors has also been playing a prominent role [3], [4]. There is no denying in portraying that the role of leadership, is prone to change depending on the situation. Studies [5] show that the lack of effective leadership in software projects is among the top road blocks of the project success. Hence, this role particularly helps enhancing the team culture and thereby enhancing the organizational

structure and culture. Furthermore, an ideal leadership provides an environment that is adaptable enough so as to maximize the productivity of the employees in an organization [6]. This essay is structured in the following way. Section 3 describes about the leadership profiles along with the relevant motivation. Section 4 tells about the team structuring. Section 5 elaborates about the selection and profile of the team. Section 6 has conclusions which is followed by the appendix.

III. LEADERSHIP PROFILE IN SOFTWARE PROJECTS

The leadership style suitable for this project from the author’s perspective is that the leader should be a blend of delegating and participating style of leadership [7]. The major traits of participating leadership used in this project are encouragement and support, determining what the next step can be (or) will be and focusing on the results [8]. Justifications for using traits of empowering leadership are oriental with power sharing and giving more responsibility to the followers and it has proved to be showing significant positive impact on the performance of the team and organization [9]. Adding to what has been said, the following are the activities that the project manager will be prepared to take up.

- Setting deadlines for the projects without hindering the team’s creativity has to be implemented to ensure the progress of the project [10].
- The team has to stay informed about the progress of the project and the project

will see the involvement of team in decision making [11].

- Log meetings and interaction sessions with respect to the team is ensured so as to improve the communication between the team members [12].
- There is no denying that the project manager is all-in-all the ultimate driving factor and the manager has to be aware of this [13].
- Reciprocating the above from the manager in the form of belief is important. Believing in the team members that every individual has the potential to make the project successful has a significant effect on the team all together [11].
- Apart from all of the above activities, constantly giving feedback to the team will show positive results in the project [14].

Assumptions:

Since the software is a “*software/platform as a service*”[15], the following assumptions are made to ease the management of the leadership by the project manager to derive insights about the team.

A1: The project is a calendar year centric project, given that the project starts in January.

A2: The team consists of 11 people, **excluding** the project manager who assumes the role of the leader of the team and has enough experience to manage a team.

A3: There are 8 developers, 2 developers and 1 documentation writer, out of which the characteristics of Senior Programmer 1, Senior Programmer 2 and Test Engineer 2 are given.

A4: The software project in this context is an innovative investment banking platform for which 8 resources are to be chosen.

A5: The selection of the team is based on the traits and other dynamics related to leadership.

Whilst confronting the challenge of forming the team of 11, the project manager is given the task to select the team members on the basis of work experience, level of expertise and domain knowledge. This requires a vision to assess the capabilities of an individual. Hence, like JF Gardner said, the first task of leadership to assert vision is implemented here [16]. Building a team always has a prominent role to play when it comes to delivering a project. As [17] dictates that the composition of a team is a multifaceted factor and is proportional to the effects on the team processes. Hence giving out proper roles and responsibilities to the team is the threshold responsibility of the project manager. The following is a table consisting of the resources that are already the part of the team.

Designation	Age	Gender	Description
Senior Programmer 1	37	Male	Married, Good level of expertise, Easy in communication.
Senior Programmer 2	32	Female	Not married, High level of expertise, Productive
Test Engineer 2	24	Male	Not married, Low level of expertise, Requires a mentor.

Table1: Description of the available resources

IV. TEAM STRUCTURING

Fiedler in [18] says that the productivity of the team depends on the character of the leader and that specific leadership situation. However, immaterial of the project that is, teams play an important role in being the building blocks of the project [19]. Aligning the human resources also become very efficient and optimized when the organization is structured in teams. Da Silva in

[17] preaches out that the team is the sole reason to achieve effectiveness in any project. Also, in this tasks 'context, it becomes significant as to how the project manager is going to select the team. Configuring the selected team optimally is also a major criterion here [17]. Structuring the existing profiles and integrating them to the rest of the team is considered. Below is the exoskeleton of how the team will look like.

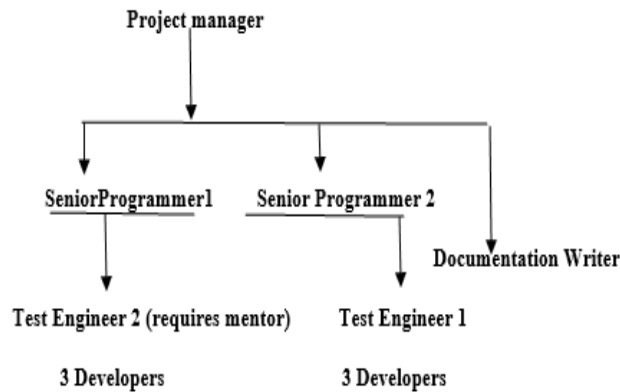


Fig1: Hierarchical figure of the team

Since the leadership style is more towards the participative style and the project manager is the work distribution demands to be unbiased [20] hierarchical work break down structure is used for team structuring.

V. TEAM SELECTION AND PROFILE

In this section, following factors and characteristics are considered to build a team of 11 and structuring the team like above.

- **Experience in the Domain:** To promote the balance in the team, members with understanding the product, workflow and required technical expertise are selected. This will enhance the growth as a team and the culture as an organization [17]. As Senior Programmer 1 and Senior Programmer 2 have experience worth mentioning, they can assume the roles of team leaders. Further, as senior programmer 1 has high skills and easy to communicate, the **Test Engineer 2** will be mentored by him.

- **Gender Diversity:** This factor is considered important as a part of the organizational structure. Since it is considered as a competition differentiator [21], promoting this factor will only result in wider consumer base, fresh management ideas and yielding a balanced output. Therefore, this factor has to be implemented in this software team as well when the rest of the team is taken into consideration.
- **Costs of Training:** Training the team about the product that is about to be built is important with regards to understanding of the product and the workflow needed. Since the delays in the software projects are majorly caused due to training costs, the human resources department assumes the role of investing enough amount of time into training the team. This enhances the composition of the team and ensures high project performance [22]. However, the selection is done only if the candidate's training cost appears to be promisingly less.
- **Resources Available:** Availability of all the estimated resources may just not be there in the vicinity. Hence, whilst forming a team to work with, it is important to ensure that the resources are present at the times needed. This can create a lot of impact when working with a team.

With these factors considered as criteria for the selection of the team, tapping different categories of personnel by the project manager and providing them with opportunities will likely make the team balanced and optimal. The following are the characteristics that are expected and the respective rationales are provided as well.

- **Fresh Graduates:** With the relevance of product's knowledge, emerging technologies, innovative ideas and considering the project's training costs, **two** fresh graduates (**FG1, FG2**) for the role of **two developers** are taken for this

project. Hence, the training costs are balanced and a window for innovative ideas is provided [14]. Mentorship can be given by the Senior Programmer 2 and hence gender diversity is also promoted.

- **Intern:** Integrating an intern of the position of a documentation writer is mutually valuable to the company and that particular person. It enhances the maturity in the person's approach to work. Consequently, training costs in terms of technological dynamics also reduces by a huge margin [23].
- **Moderate Knowledge:** The personnel who already received training in line with the dynamics of the project are also looked into. Considering their expertise level of domain, **three developers (D1 and D2)** are taken and they are distributed one under each team leader. Their experience can be used to tackle the technical challenges and new experience in risk management will likely be provided. In this way, there is a mutual chance of growth.
- **High Knowledge:** Since developing a software involves implementing the knowledge work, expertise in this field is most valued. Teaming up with the personnel who have previously excelled in different projects will only set us on the advantage side. Furthermore, her peer and domain knowledge is used to give away advices whilst in crisis. For this, one member for the role of **senior developer (SD1)** is selected and can work under Senior Programmer 2.
- **Consultant:** Apart from generating an opportunity, this position is created to use the consultant's previous project-centric knowledge as a part of this project. This consultant assumes a dual role of the **Test Engineer 2** as his project knowledge will be of use while diagnosing vulnerabilities in the project. Also, when a consultant is hired, there is likely a chance of, out of the box

cognitive dissonance being implemented to improve the employee morale [24] One consultant is considered for this project and is assigned to work under the Senior Programmer 2.

Below is the table of rest of the team's composition that the project manager sees fit for this software project based on the availability of their respective roles.

No. of personnel	Experience	Availability	Role
2	Newly Graduated	Full time	Developer
3	Relevant Experience	Full Time	Developer
1	Intern	Part Time	Documentation writer
1	Relevant Experience	Full Time	Test Engineer/Consultant
1	High Experience	Part Time	Developer

Table2: Composition of the rest of the team

VI. CONCLUSIONS

The **Immaturity-Maturity theory** by **Chris Argyris** [7] will influence the team members as the role of leadership and considering the project demands will be in such a way that the team member will build the following characteristics.

- Independent while taking decisions
- Build deeper roots of interest
- Active in participating
- Long term vision and goals
- Self-awareness

Therefore, **Immaturity- Maturity theory** and **Cognitive dissonance theory** [7] have been particular traits of motivation and are considered to be driving factors that fits well in this scenario. Diversity is a significant factor for a team to have high amounts of exposure in technical skills, inter personal skills and experience. This becomes even more significant as the project is innovative and demands out of the box thinking. Furthermore, the traits of project manager that are required to build a strategic and balanced team have been discussed.

APPENDIX- A:

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