

PA2513 – Advanced Software Project Management

Assignment-2

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1. INTRODUCTION

Developing a software has been made part of human civilization such that most of the current technologies have experienced a huge growth. Software development is a complete form of developing a project with variance in size, structure and complexity of project. It is believed that success of the project is entirely relied on assigning a suitable leader to the project [1]. Project manager is one of the important key persons in project success [1]. Project manager has the responsibility of monitoring the development process of software. He /She controls and manages the activities that are useful for driving the project towards success. Some of the previous studies show that planned and scheduled projects with sufficient resources may tend to fail because of ineffective project management. So, it is necessary to have a project manager with effective leadership skills [1] [2].

Leadership skills are necessary for any leader to contribute towards project success. It helps in influencing in other people who eventually motivate by seeing their leaders. Effective leadership can strengthen confidence among team members and motivate other employees in reaching organizational goals [2]. As employee follows the decisions made by project manager, those decisions should be task oriented and provide directions for each employee to complete their tasks. A leader should have competencies such as diagnosing, adapting and communicating. The aim of this project to increase the effectiveness of a team by selecting a leader to team such that his style matches with characteristics and readiness of team members [3].

Bringing a group of people together and allowing them to work on a single task can be termed as team building which is not an easy task to implement. It is a constantly improving and ongoing process which requires coordination among team members thereby increasing the chances of facilitating multiple ways of working together [2]. An effective project management with a working team can contribute to project success. But implementing team building process in real time is not such an easy task, it requires a broad knowledge on skills and abilities of each team member to develop a productive team. So, this study focusses on building and structuring a team considering the personal characteristics such as experience, gender, age and other personal profile. In addition, readiness of the team members need to be identified which helps in assessing the performance of the employee. Therefore, a leadership style need to be chosen that matches the structure and profile of the team [4].

In this task, we as a team are responsible to form a team with 11 members which consists of 8 developers, 2 testers, and a documentation writer. We also have 3 members in addition to the project. **Section 2** provides the details about structuring a team whereas **section 3** gives an overview of leader's profile and different strategies used to motivate the team.

2. TEAM :

Structuring of team is important step in team building activity. It is the process of involving people who are determined to complete the given task. Experience level, marital status, age of employee and personal characteristics are some of the characteristics to be considered while selecting team members [3]. Project manager has the responsibility of organizing the team according to project requirements. Project manager should assign individual roles and responsibilities to each team member considering project requirement. According to [4], it is observed that specialty team structuring allows to select employees based on their experience which is more effective technique for assuring quality when compared with other techniques.

The following are some of aspects need to be considered for forming a team [5].

1. Level of experience : Members part of the team differ in experience and skillset. Consider an example of a team where some of them can be highly proficient in their domain while some other people may be moderately skillful or some other members are freshers who have begun their career initially. Considering the current project, team members with technical experience is the primary requirement of project being developed [6].

2. Personal characteristics: Some of the team members are more motivated to be part of project and accept risks with much ease. Some of the characteristics are more suitable to leaders with less motivational power whereas others are more suitable to followers. It is necessary to maintain a perfect balance of these personalities to build an effective team [6].

3. Generations: A team is a mixture of several generations to complete a project. Assessing a project team based on the type of generation is typical task. Organization heads and team leaders must identify the project needs and involve team members from different generations to successfully develop the project [5] [6].

As it is necessary to structure a team with 11 people, 8 members need to be added to the project as 3 people are readily available. In the provided description, it is given that 2 senior programmers and a test engineer is present in the team. So, 6 developers, 1 tester and documentation writer need to be hired. This hiring process can be completed in two ways. They are homogenous and heterogenous.

If a team is structured such that every member in the team have same level of experience, skillset and ability to complete a task, it leads to frame a homogenous team. This kind of hiring can hinder the quality of project. So, this option has been eliminated.

If a team is organized such that developers, tester and documentation writer are of different age, skillset, experience levels successful results can be seen. Bringing diverse team members together can increase knowledge sharing and quality of work. According to [6], if diverse skillset people together results in higher level performance when compared to homogenous type of environment. Considering these factors and maintain heterogeneity in team, team members are hired such that they possess different characteristics.

As assigned to hire a team of 8 members, 4 experienced graduates and 2 recently graduated people will be made part of the team. Experienced developers are made part of group such that both genders involved and diversity in age is seen. This increases the effectiveness in work and allows sharing of knowledge between employees. From the literature, it is observed that experienced developers in the team can influence other people and provide a lot of support in driving the project towards success. 2 recent graduates are chosen because young talent will have the knowledge about trending technologies which increases the ease in work. Other qualities such as high curiosity to learn about new technologies and implement them, ability to handle multiple tasks and innovative thinking are some of the qualities seen in a recent graduate [7]. Experienced developers are expected to guide these freshers by motivating them and reach the goal. It should be ensured that proper training is provided to each employee to have clear overview about project aims and objectives [8].

A tester need to be added to the team as the available candidate is not very skillful and unable to work independently. So, a tester who can assist him in testing is the needful requirement. To best suit this role, an experienced tester need to be hired to ideally test the software and achieve qualitative results. A recent graduate cannot motivate another person as he doesn't have prior practical experience in working environment [9]. As inappropriate testing, can hinder the quality of product and lead to complex situations, experienced tester is chosen

Documentation writer with much experience can be hired as this role is much important to team's success. Progress of each task need to be documented properly to maintain a log of records. The person can use his experience to document the needful tasks. Incorrect documentation can lead to miscommunication between employees and hinder quality of project. As this role is an important part of software development, experienced writer has been made part of team to avoid incorrect documentation. The following **Table-1** provides

information about each team member and their personal profile. It includes age, gender, marital status, readiness level, experience. Employees are hired based on these characteristics and later readiness level of employee is determined.

Role	Profile Description	Readiness
Senior Programmer(Developer)	Female, 32 years, Not-married, very skilful and productive	R4
Senior Programmer(Developer)	Male, 37 years, Married, Skilful, works with passion, easy in communication	R4
(Experienced) Developer	Male, 40-44 years, Married, Highly skilful, passionate, experienced, can motivate others.	R2
(Experienced) Developer	Male, 28-30 years, Married, not very skilful, un-willingness to work, can communicate easily, experienced.	R3
(Experienced) Developer	Female, 30-35 years, Not-married, graduated, moderately skilful, can mentor others, Much experienced	R3
(Experienced) Developer	Male, 35-35 years, Married, very skilful, experienced, passion with work,	R4
Developer (Recently graduated)	Female, 21-23 years, Un-Married, Not experienced, Very skilful, willing to work.	R4
Developer (Recently graduated)	Male, 21-23 years, Un-Married, Recent graduate, Very Skilful, un-experienced, Not passionate to work, work independently.	R2
Documentation Writer	Male, 30-35 years, married, experienced, skilful, productive, can communicate easily.	R4
Test Engineer-2	Male, 24 years, not married, not very skilful, cannot work independently, requires mentor	R2
Tester	Male, 38-42 years, Passionate, married, can work independently, Highly skilful, can motivate others, experienced.	R4

Table-1 Team member role, profile and assigned readiness level

Readiness level can be defined as extent to which a team member can complete a task. This level is determined based on ability and willingness of employee to assigned work. Employees with high satisfaction, more passionate to work and exhibit high performance are provided with higher level of readiness level. After hiring each team member, team leader asses each employee performance by providing different readiness levels to each of them. Team leader gives a readiness level to employee based on the following criteria [3]:

- **R1: Unable and Unwilling or Insecure** → Employees unwilling to work and feel insecure. Not passionate towards work and requires motivation from other employees.
- **R2: Unable but willing or confident** → Act per situations, passionate and willing to work, confident in taking decisions and accepting risks.
- **R3: Able but unwilling** → Can't tolerate heavy work, hesitant, concerned about their own performance, has ability to work but don't show up much willingness.

- **R4: Able, willing and Confident** → Have ability to work independently, willingness to work, confident in taking decisions.

Other employee's characteristics:

A software project is a mixture of different tasks with various complexity levels [2]. Each task need to be handled separately with individual approach by different employees. Executing a task requires an individual who have expertise in their domain to successfully complete the project. So, employees should have a mindset to share knowledge, integrate to different conditions in a multicultural environment. So, it's the responsibility of team leader to assure that each employee reaches R4 level of readiness by motivating people, assigning tasks based on their skill. Experienced employees in team should try to encourage newly graduates by providing valuable insights and suggestions about project. Achieving this can increase coordination between team members and reach project manager expectations [11] [3].

3. LEADER :

Leadership can be stated as extent to which an individual influences a group or team by utilizing the available resources. A project team consists of different kind of individuals with various skills, behavior and experience levels where team leader needs to manage these persons without losing patience. Previous studies show that leadership skill, behavior is associated with effectiveness of project manager in team building. There are certain responsibilities of a project manager to manage the team effectively such as interaction with employees, reporting project to organization, scheduling project, managing and controlling budget, maintaining a control on risk and quality aspects [11].

Project manager should be capable to handle the changes and make team members prepare to handle the change. An effective manager should be goal oriented, have ability to communicate with other employees in understandable way, react according to the situation, take decisions that supports the project evolution. According to [12], there exists two types of leader behavior which results in 4 different types of leadership styles. They are relationship and task behavior. Relation behavior refers to type of socio-emotional support provided by leader to their employees working under his guidance whereas task behavior refers to amount of direction and guidance given by leader in reaching the goal. A leader can exhibit 4 different type of styles by varying the level of task and relational behavior from low to high [12] [13].

- **S1: Telling**→ High Task Behaviour, low Relational Behaviour
- **S2: Selling**→ High Task Behaviour, High Relational Behaviour
- **S3: Participating**→ Low Task Behaviour, High Relational Behaviour
- **S4: Delegating**→ Low Task Behaviour, Low Relational Behaviour

Leader must adjust his/her style based on the readiness level of employee. Consider an example, if an employee is provided with readiness level R1, then he would react to leader if they follow leadership style-1. Leader can adopt any kind of style by assessing the profile and determining readiness level of employee.

There are certain activities conducted by project manager to motivate the team.

- Initially, project manager should take care of conducting kick-off meetings with all the team members in project. This meeting can help to eliminate any confusions in team members and discuss project requirements clearly [14].
- Leader should be able to make decisions to achieve goals and objectives of project and drive project towards success. Project manager should also have a mindset to appreciate a person who achieved a great success in their respective task [15].
- Project manager should initially conduct training sessions to every team member. Because technologies are emerging day by day. Though team members may have experience in their domain, attending these training sessions can further increase their knowledge level and enhance project quality. Freshers who are new to the project must necessarily attend these sessions to have a clear overview about project. It should be ensured that these training sessions should help to improve technical, interpersonal and communication skills [16].
- Project manager should set-up milestones at regular intervals to check the progress of the project and each team member's contribution to it.

- Project manager need to assign tasks to each employee based on their capability and skillset. This can improve performance of individual thereby contributing to improve project productivity. Leader needs to follow a relative style based on readiness level of employee [3].

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