

# PA2513 – Advanced Software Project Management

## Assignment-2

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### 1. Introduction:

Software projects have always been an important part of human civilization. It is a complete form of software development varying in size, team structure and composition depending on the efficiency and complexity of project. Success of any project is relied on selecting a suitable project manager for the project. Much research show that Project manager plays a key role in undertaking the responsibility of executing the software development project. He /She monitors the development process by controlling and managing the activities involved in production [1]. Furthermore, project managers communicate with all project related personnel at various organizational level. Planning, scheduling, controlling, staffing and motivating are the primary responsibilities of a project manager. Previous experience shows that, the most planned and scheduled projects have resulted in failure due to lack of effective project management. So effective management skills such as into technical, human and conceptual skills should be used by project manager should use these instead of personality traits [2].

To maximize the productivity of an organization, it is necessary to have a good leader for guiding employees to have a blissful environment. Leadership can be defined as influencing the behavior of an individual or group regardless of the reason. It is more towards achieving goals rather than creating them. It is directive and task-oriented where decisions are undertaken by managers and employees follow their decisions [2]. Moreover, to achieve these goals, team members should be allowed to implement new practices and ideas. To lead a team in a project requires competencies such as diagnosing, adapting and communicating.

Organizing a team plays an important role for the success of project. It should be done by considering qualities such as work experience, level of expertise and domain knowledge of team members. Project manager should consider these factors to assign roles and responsibilities with in a team. The role of guiding these organized teams by providing leadership in rightful path to attain organizational goals and satisfaction among employees is taken by project manager. As a leader of a team, project manager should have the ability to adopt different leadership styles pertaining to a situation for effective functioning of the project team. Moreover, these abilities will have a direct impact on project success so identifying and understanding the role of leadership in software project management is important. Therefore, this document will focus on structuring the team according to personal characteristics, describing the profile of leader & team and motivating each scenario.

### 2. Team:

Structuring a team is the process of involving people who work to reach the desired goal. These teams are expected to reduce risk, cost and time spared on using resources thereby increasing the quality of the system. Effectiveness in structuring the team determines the quality of the system being developed. Initially team members should have unique roles and responsibilities to perform their individual actions which further contributes to success of the project collectively [3]. Organisation of team enormously affects how effectively they perform. According to [4], there exists four types of team structures. Among them, Speciality team structuring is chosen which allows expertise towards employees to be used most effectively.

As assigned to form a team with 11 people, three people were already available in the organisation so it is necessary to add 8 more team members in the software project. It is given that 2 senior programmers and a test engineer is present in the team. There is a need for 6 developers, 1 tester and 1 documentation writer. Hiring of these personnel can be done in two approaches

- By selecting team members who have same skillset and ability to complete a task will lead to form a homogenous team. These kind of homogenous recruitment can impact the quality of the project. Hence this option is avoided.

- By hiring developers, tester and documentation writer who have different age, skills, experience levels and abilities will provide better results for the success of the project there by increasing the quality and performance of the team. Diversity in age can be beneficial to the organisation as different generation people work at a same place [5]. According to [6], people with same skillset can never perform differently whereas people with different skillsets show higher level performance when brought together. Involving team members with different level of experience will provide an opportunity to share the knowledge between the employees. According to glaser [7], heterogenic team is a combination of cognitive, cultural and institutional interests. The diversity in terms of knowledge, ability, age, experience and personality traits helps in open communication between employees thereby adopting innovative approaches to develop new techniques and solutions [8]. So to have diversity within a group, 6 developers, 1 Tester and 1 documentation writer with different characteristics will be hired. Hence 8 members are added to the team considering following personal characteristics:
- 4 Experienced developers and 2 recent graduates are selected as developers to this team. Experienced developers who have diversity in age and gender are chosen as they play an important role in the project. Team Effectiveness and value of information gathered will increase by involving people with these characteristics [9]. Sharing of knowledge in their expertise domain can improve effectiveness in work. However, it is considered that developers experience in working on complex systems can affect the value of project and drive towards project success [10]. The motive for choosing 2 recent graduates to add young talent to the project. Curiosity to learn about new things, capability to perform multi-tasks, enthusiasm towards work, thinking innovatively are some of the desired qualities of a team member. All these type of qualities can be seen with in a fresh graduate. Thus adding a graduate to the team will refresh the environment [11]. Proper training should be provided to these individuals to have an understanding on milestones and goals of the project.
- An experienced tester is selected as there is a requirement for one tester. As the available tester is not very skilful and cannot work independently, a mentor who can assist him in testing is necessary. So an experienced tester who has rich skillset in testing can help to test the software to achieve ideal results. Selecting a graduate with no experience can lead to bias in formal approaches followed to test the software [12]. Inexperienced testing may also lead to failure of the product. To avoid such issues, a tester who is self-motivated, can work independently in complex situations is chosen [10].
- As documentation of software is a knowledge related work, the most important aspect is expertise in particular domain. Experience in particular field over years helps in gathering enormous knowledge and enhances personal ability [13]. So considering these reasons, experienced documentation writer is selected as documenting the results is considered one of the important task in software development. Documenting the results incorrectly can lead to miscommunication between individuals. So to avoid any problems that may occur while documenting, an experienced writer is chosen.

Table 1 gives information about the designation of the team member, personal profile of each individual which includes Sex, age, Marital status, ability to do work, passion towards, readiness and experience. These factors are considered while hiring the employees and later determine the readiness of the employee.

| Team member                  | Profile   | Readiness |
|------------------------------|---|-----------|
| Senior Programmer(Developer) | Male, 37 years, Married, Skilful, works with passion, easy in communication                       | R4        |
| Senior Programmer(Developer) | Female, 32 years, Not-married, very skilful and productive  | R4        |
| Developer                    | Male, 24-30 years, Not-married, Recent graduate, not very skilful, requires mentor, no-experience | R3        |
| Developer                    | Female, 45-50 years, Married, very skilful, passion with work, experienced                        | R4        |
| Developer                    | Female, 35-40 years, unmarried, moderately skilful, experienced, passion towards work.            | R2        |

|                        |  |    |
|------------------------|--|----|
| Developer              | Male, 30-35 years, married, experienced, not-skilful, un-willingness to work, easy in communication. | R3 |
| Developer              | Male, 45-50 years, Married, experienced, skilful, willing to work.                                   | R4 |
| Developer              | Female, 25-30 years, un-married, Recent graduate, Skilful, un-experienced, work independently.       | R3 |
| Senior test Engineer-1 | Male, 40-45 years, married, skilful, experienced, work independently.                                | R4 |
| Test Engineer-2        | Male, 24 years, not married, not very skilful, cannot work independently, requires mentor            | R2 |
| Documentation Writer   | Male, 30-35 years, married, experienced, skilful, productive, can communicate easily.                | R4 |

**Table 1 Profile of team member and respective readiness**

According to [2], readiness can be defined as the extent to which team members can accomplish a particular task. Ability and willingness are used to demonstrate the readiness of a team member. According to [14], Team members with higher ability and willingness will have more job satisfaction and exhibit higher level performance and shows less intention in leaving organisation. Employees with right ability should be selected to do appropriate job, thus willingness to complete the assigned task will also increase with increase in ability. After recruiting team members, their performance is assessed using readiness based on given task. Readiness is assigned to the employees mentioned in table-1 after allocating the tasks and monitoring their work based on following criteria [15]:

- R1: Unable and Unwilling or Insecure → This style is assigned to employees who are unwilling or unable to complete a task, perform tasks on exact request and gets intensively frustrated. Confused, unclear behaviour, concern over possible outcomes, fear of failure that are related to Unable and Insecure follower style are assigned with R1.
- R2: Unable but willing or confident → This follower style is assigned to team members who can speak and act quickly, seek for clarity, listen carefully and accept tasks.
- R3: Able but unwilling → Employee who is hesitant or resistant, feel over worked and concerned about performance are assigned with R3.
- R4: Able, willing and Confident → This style is assigned to staff who are capable of Informing task progress to higher authorities, use resources efficiently, knowledgeable and willing to help others.

#### **Characteristics of rest of employees to work with already present employees:**

Software projects are typical and complex to implement as they involve unstructured tasks. Executing these projects require personnel who have expertise in their domain. So, a software team should be framed such that knowledge among team members is distributed successfully to complete the project. Employees in the team should have ability and willingness to complete the project by sharing knowledge, adjust to conditions and multi-cultured environment. Here, team cognition plays an important role to draw a well-structured knowledge by co-ordinating with the teammates [16]. As a leader of project team, each member of the team should be seen that they reach R4 level of readiness from any other levels to improve team performance. This can be attained by effective coordination between team members and maintaining project manager responsibilities successfully.

### **3. Leader:**

The role of project manager is quite challenging as a leader when compared to other functional managers. Project manager has the responsibility of leading a diverse set of people with direct control over the team members. Managing a project for a team in a work environment is considered complex due to 2 reasons: (i) uniqueness in each project, (ii) selection of ideal team members [17]. According to [17], responsibilities of a project manager includes:

- Interacting with users
- Reporting issues to senior management

- Scheduling, budgeting and planning
- Co-ordinating the activities of project
- Managing people and delivering the results
- Quality and risk control

Project manager role is to manage commitments and handle any changes in the organisation successfully. It is necessary to identify an experienced project manager with right qualifications and has capability to manage above mentioned responsibilities. An effective project manager should be goal oriented, ability to work under pressure and communicating with other employees to exhibit leadership skills [17]. In-Addition to this, project manager should be capable of reacting according to the situation of the project. A particular leadership style has to be followed in certain circumstances which effects the specific situation. Project manager can follow situational leadership model to know the difference between task behaviour and relationship behaviour. Task behaviour refers to amount of guidance and direction given by a leader, moreover socio-emotional support provided by leader would refer to relationship-behaviour. By varying the level of task behaviour (TB) and relationship behaviour (RB) from low to high, 4 different styles of a leader can be seen. The four resulting styles are [15]:

Style-1 → Telling: High TB, low RB

Style-2 → Selling: High TB, High RB

Style-3 → Participating: Low TB, High RB

Style-4 → Delegating: Low TB, Low RB

The most effective style is determined by readiness level which a team can exhibit. Matching level of leadership style and readiness will maximize the effectiveness of team. Hence, R1 follower level would react better to a leader with Style-1. Leadership style should vary accordingly with change in level of readiness from lower level to higher level [15]. By following this approach, readiness of follower towards a project can be assessed. In this project, leader can follow any of the styles mentioned above assessing the profile and readiness levels of each employee as in table-1.

The various activities that are need to be undertaken by project manager to motivate a team are:

- At each stage of development, project manager has the responsibility to conduct the kick-off meetings with team members. These meetings are conducted to ensure that each member in team has clear vision on organisational goals and milestones of the project [18].
- Project managers often make decisions to bring out the business ideas, strategies, mission, goals and objectives required to shift organization in a desired way. Moreover they should reward team members for their achievements as this helps in increasing the overall performance of individual [2].
- Setting up mile-stones and maintaining a track of deliverables of the project are the primary tasks that project manager should take control off. But excessive control should not be imposed as this may lead to loss in creativity of particular individual [19].
- Though a diverse personnel are present within a team, it is necessary to provide training to each employee before initiation of project. New and innovative technologies emerging are showing great impact in modern trend. So team members should be made aware of using technologies for development and testing. All members of team should be trained at same time to understand pros and cons of each member and achieve higher performance. This kind of training can help to overcome conflicts and barriers between team members. Training should include development in interpersonal skills, communication ability etc., without limiting to technical training [5].
- Trust should be built with in team members such that each member believes project success can be seen if effective implementations are used for development. Project manager has the responsibility of building confidence among team members to work until goal has been reached [20].
- Conducting meeting after each phase to review the progress of the project and make any changes required with prior permissions and approvals [18].
- Project manager should have the capability to assign tasks to desired employee and motivate team members to improve their productivity and performance. Adoption of particular leadership style based on the situation and readiness level of follower is needed [2].

## APPENDIX

### Reference:

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