



BACHELOR OF COMPUTER APPLICATIONS

SEMESTER 6

DCA3245

SOFTWARE PROJECT MANAGEMENT

Unit 9

Team Development and Conflict Management

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1. INTRODUCTION

In the previous unit, we have discussed about configuration management. In this unit, we shall discuss about an important requirement in project management viz., building a strong development team. We will also learn about various team organizations and how to resolve conflict among team members.

1.1 Objectives:

After studying this unit, you should be able to:

- ❖ *Explain various team organizations*
- ❖ *Assess the performance of different team organizations*
- ❖ *Enforce team discipline and resolve conflict among team members*

2. BASIC CONCEPTS

Being not able to meet the schedule is a common problem the project manager has to face during the execution of the project. There are several reasons behind that; but the common problem one faces is the intellectual power that is in short supply. Finding the skilled developers needed for the project is always a very big challenge to address. It is as important to recognize that the right engineering talent can help. Thus, temporarily reassigning senior engineers to a part of the project that is suffering or hiring expert troubleshooting consultants are viable options. Another option is to examine the requirements and remove the ones that are not absolutely necessary. Sometimes, the requirements are "gold plated"; that is, there is too much attempt to provide a shiny veneer that does not add to the substance of the product. Cutting out unnecessary requirements is called requirements scrubbing.

The success of such a recovery action is directly related to the incremental principle. Even if we are not planning incremental delivery of the product, it is important to design a product that may be divided into subsets. Furthermore, it is the key that development proceeds incrementally in the order of importance of the requirements. It will not be helpful if we decide that we can scrub some requirements in order to recover from a slip in the schedule, but those requirements have already been implemented. Thus, the incremental principle must be followed not only during requirements analysis, but also during project planning, scheduling, and implementation.

It is possible that after we consider all options for recovering from a slip in the schedule, we find no appropriate solution. At this point, the best thing to do is to admit the incorrectness of the original plans and schedules and revise the schedule on the basis of new knowledge about the difficulties of the tasks, the capabilities of the engineers, and the availability of the resources. The manager must view a schedule as the best attempt to predict the development cycle. Still, it is merely a prediction, and while it is important to attempt to produce the most accurate prediction possible, it is also important to realize the risks involved with predictions and be prepared to revise the plans if necessary. Clearly, the larger the consequences of a slip in the schedule are, the more important it is to plan and schedule carefully.

Coming back to the issues with resources; it is not only enough to add the right resources to the project. We also need to monitor the team dynamics. It is of no use if we have technically competitive resources meeting the needs of the project; but the team suffers from poor understanding of each other's work resulting in a chaotic situation. This is where proper handling of the team comes into play to develop proper bonding so that the conflicts can be effectively managed for the success of the project.

Addressing Conflict Avoidance in the Workplace

Many workers prefer to avoid conflict at work because they want to be viewed as agreeable and cooperative.

This is done with the best intentions, yet it leaves them just as responsible for creating a hostile work environment as their more aggressive co-workers. Conflict is inevitable in the workplace, but that's okay. Problems arise when we try to avoid conflict.

High turnover, a dysfunctional work environment, strained communication, a loss of productivity, and impaired teamwork are all negative consequences of avoiding conflict.

Your company's reputation will take a hit, making it harder to attract and retain high-caliber employees in the future.

All HR professionals should focus on conflict avoidance and interpersonal conflict resolution for these reasons.

Ignore the issues to handle well the conflicts: Both are enthusiastic about the proposed solution, but instead of discussing the pros and cons of each option, one side keeps quiet and refuses to take charge.

Although they may have a valid point, avoiding an open dialogue will do nothing to further the company's goals.

Complete Withdrawal From the Situation

This is a common strategy for introverts to avoid conflict.

When confronted with a challenging or unpleasant conversation, an employee may appear to shut down.

People that employ this kind of policing strategy tend to be confident in their methods because they aren't overtly aggressive. However, Taking no action towards fixing a problem is just as counterproductive as doing nothing at all. When people take such a hands-off approach, they provide nothing of value.

How conflict avoidance is harmful for business:

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Example of conflict avoidance:

First, it's important to recognise the many manifestations of conflict avoidance. Discuss the three most common forms of conflict avoidance in the workplace.

Imagine that your coworkers Sarah and John are engaged in a joint venture. Because of their dissimilar methods of getting the job done, they have occasionally butted heads.

Their manager tells them one day that they need to work on their teamwork and communication skills. Sarah and John are aware of the feedback and its significance but are reluctant to broach the subject of their disagreements and prospective problems.

Sarah and John, in response to the conflict, both take the following steps separately rather than confront the matter head-on:

The Sarah Method:

Sarah opts to ignore John and concentrate on her own job rather than try to start a conversation with him about their different approaches to the office. To avoid more tension, she suggests they carry out their various duties in isolation from one another.

Method of John:

John, on the other hand, has decided not to tell Sarah about the criticism. Without bringing up their differences, he makes an effort to be more flexible with Sarah's tastes. He thinks this will be good for the team dynamic.

The outcome is that Sarah and John may feel a short-term easing of stress, but their underlying difficulties with respect to their working styles and methods of communication remain unsolved. This strategy of avoiding conflict could keep us stuck with the same problems forever.

It's worth remembering that avoiding arguments is a perfectly reasonable tactic sometimes. This is especially true when tensions are high or when there is no good moment for rational discourse. However, it's also important to know when avoiding conflict isn't an option and an open discussion is necessary for progress.

Steps to follow to avoid conflicts:

1. Simply ignore the issues at the hand
2. Change of conversation
3. Complete withdraw from the situation
4. Conflict avoidance among team members
5. Performance management
6. Adaptive project frame work
7. Project Team members
8. Working with people who avoid conflict
9. Feeling from authority
10. Conflict avoidance and delay decision making
11. Avoidance penalises high achievers
12. Changes of Direction

3. ORGANIZATION TYPES

The organizing function of management deals with devising roles for individuals and assigning responsibility for accomplishing project goals. Organization is basically motivated by the need for cooperation when the goals are not achievable by a single individual in a reasonable amount of time. An organizational structure is necessary at any level of an enterprise, whether it is to coordinate the efforts of a group of vice presidents who report to the president of the corporation or to orchestrate the interactions among programmers who report to a common project manager.

The aim of an organizational structure is to facilitate cooperation towards a common goal.

Management theorists and practitioners have studied the effects of organizational structures on the productivity and effectiveness of groups. Because the goal of organization is to encourage cooperation, and because cooperation substantially on human characteristics, many general organizational rules apply to any endeavor, whether it deals with software production or automobile production.

The task of organizing can be viewed as building a team: Given a group of people and a common goal, what is the best role for each individual, and how should responsibilities be divided? Analogies with sports teams are illuminating. A basketball team consists of five players on the floor who are playing the game and another perhaps five players who are sitting on the bench as substitutes. Each player knows his or her role. There is one ball, and at any one time, only one player can have it. On well-organized teams, the patterns of cooperation and their effects are clearly visible. In poorly organized teams or teams with novice players, the lack of patterns of cooperation is clearly visible: When one player has the ball, the other four scream for it to be passed to them. The player with the ball, of course, shoots the ball instead of passing it to anyone.

Some of the considerations that affect the choice of an organizational structure are similar to the factors used in cost estimation models that we have seen earlier. For example, what constitutes an appropriate organization for a project depends on length of the project. Is it a long-term project or a short, one-shot project? If it is a long-term project, it is important to ensure job satisfaction for individuals, lead high morale that reduces turnover. Sometimes,

the best composition for a team is mix of junior and senior engineers. This allows the junior engineers to do the less challenging tasks and learn from the senior engineers, who are busy performing the more challenging tasks and overseeing the progress of the junior engineers.

Because of the nature of large software systems, changing requirements, and difficulties of software specification, it has been observed that adding people to a project late in the development cycle leads to further delays in the schedule. Thus, the issue of personnel turnover is a serious one that must be minimized. On a short-term project, personnel turnover is not as important an issue. On a long-term project, it is essential to allow junior personnel to develop their skills and gain more responsibility as senior personnel move on to other responsibilities.

Another issue affecting the appropriate project organization is the nature of the task and how much communication the different team members need to have among themselves. For example, in a well-defined task such as building a payroll system in which modules and their interfaces have been specified clearly, there is not much need for project members to communicate among each other, and excessive communication in the organization will probably lead to a delay in accomplishing their individual tasks. On the other hand, in a project where the task is not clearly understood, communication among team members is beneficial and can lead to a better solution. Strictly hierarchical organizations minimize and discourage communication among team members; more democratic organizations encourage it.

One of the general considerations in team organization is the appropriate size for the team. On the one hand, a small team leads to a more cohesive design, less overhead, more unity, and higher morale. On the other hand, some tasks are too complex to be solved by a small team. Since we cannot control the size or the complexity of the tasks we have to solve, we need to match the size and organization of the team to the problem. Too few people cannot solve an inherently large problem, but assigning an inherently small problem to a large team also leads to problems, such as too much overhead, overambitious solutions, and solutions that are too costly.

The direct relationship between program complexity and team size is formalized by the **COCOMO** model, where, given the estimate of the size of the software, we can derive the required number of engineers from a formula. How should these engineers be grouped into teams? In general, a small team suffers less overhead and therefore has more productivity per member. We can summarize the considerations of team size as follows: A team should be large enough, but not too large, and small enough, but not too small. Experimental evidence has shown that the optimal size for programming teams is between three and eight, depending on the task. If more than eight people are needed, one can introduce extra levels of management to keep the span of control of each manager manageable.

The size of a team involved in software development is influenced by the characteristics of the software. If a group of modules exhibits high coupling, assigning the modules to different people will require too much interaction among the programmers. Thus, an appropriate design must be accompanied by an appropriate assignment of tasks to individuals and an appropriate team organization that makes that assignment possible. Rather than dogmatically dictating a team organization, one must have a flexible approach and choose the organization on the basis of the design of the system. Of course, the design must be produced by a team in the first place, and a good way to approach the task of building the team is incrementally: Start with a small team that produces a first set of the requirements and design, form a larger team and produce a first implementation, and then use the results produced by the team to decide whether an iteration of the whole cycle is required (as in the spiral model), with a possible need for a team reorganization.

When, why, and how to reorganize a team requires judgment on the part of the manager and cannot be based solely on the design of the software system. As always, the manager must weigh many factors, including the need to complete the project on schedule, to meet budget constraints, to produce a product that meets quality requirements – such as maintainability, which will reduce the project's overall life cycle costs.

3.1 Centralized-Control Team Organization

Centralized control team organization is based on hierarchical structure; it represents workers and supervisor relationship in organization. In this type of organization several workers report to a supervisor, who in turn might report to departmental head at next level and so on. The reporting structure of centralized control team organization flows from bottom to top, in top of the structure represents CEO of company. The performance of one level of the resources is monitored only by immediate manager in the organization.

Figure 9.1 is an example of centralized control team organisation. In top level of organization a chief programmer resides. Chief programmer also known as a peer project manager having responsible for administrative aspects of project. Other team member resides in the bottom level, who is reporting to chief programmer. They are having following designations specialist, programmers and librarian. Specialist may be used as consultants to the team. The task performed by specialist and programmer initiated and controlled by chief programmer. Librarian maintains software library, software library is the central repository for all the documentation and decision taken by team.

In general, centralized control works well with tasks which are simple enough that the one person responsible for control of the project can grasp the problem and its solution.

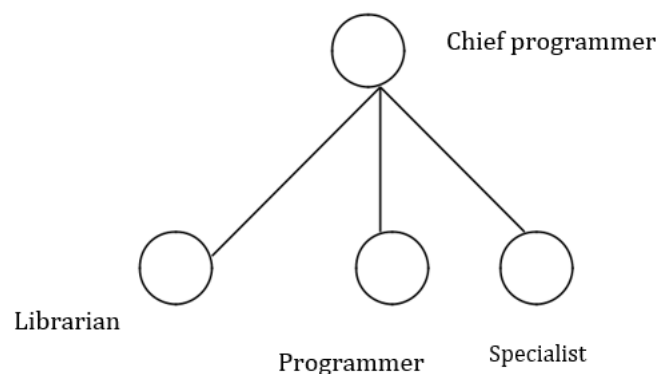


Fig. 9.1: Chief programmer team

On the negative side, a chief programmer team has a "single point of failure." Since all communication must go through, and all decisions must be made by, the chief programmer, he or she may become overloaded or, indeed, saturated. The choice of chief programmer is the most important determinant for success of the team.

The success of the chief-programmer team clearly depends on the skill ability of the chief programmer, the size and complexity of the problem.

3.2 Decentralized-Control Team Organization

The decentralized-control structure emphasizes more on team collaboration and less on hierarchical flow of the control. Here the team work is played vital role and the decisions are made based on consensus among the team members. The fig 9.2 depicts the structure of the decentralized arrangement. Fig 9.2 a shows the pattern and p.2 b shows the communication across the team members. As earlier mentioned we can see that the lack of hierarchy and every member is equally responsible for the goal of the organization.

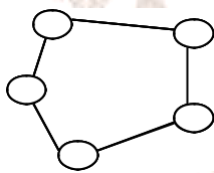


Fig. 9.2: (a) Management structure

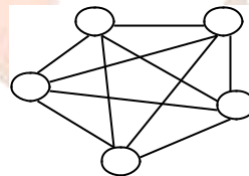


Fig. 9.2: (b) Patterns of communication

The decentralized-control has a major advantage that the team members feel highly responsible for their deliverables. This higher level of involvement by each team member leads to higher moral among the team members and the better job satisfaction. This will be having the overall positive effect on the work and the end deliverables will be of the better quality. This decentralized strategy will be particularly useful for long-term projects as such complex projects depend more on proper communication flow among the team members for success of the project and the same cannot be achieved by forceful hierarchical control.

Another advantage in this structure is that the group can act together and since every member of the team is on same page, determining the solution for a complex problem can be easier with collective effort rather than individual effort. But the care should also be taken that the team activity goes in right direction and that there are no major conflicts in the team. Otherwise the decentralized-control may lead to indiscipline and the team might totally loose the focus on the planned work. Further for a project containing large set of team members the effective communication will be challenge. Because of the high overhead in communication the decentralized-control is not preferred for such large team size projects.

3.3 Mixed-control team organization

A mixed control team organization uses the advantages of centralized and decentralized control. Mixed control organization separates engineers into seniors and junior engineers, avoids the disadvantage of decentralized organization i.e. treating all members as same, and the disadvantage of centralized organization i.e. treating single individual as chief.

Figure 9.3 is example of mixed control team organization, here the engineers separate into different levels. Each senior engineer leads a group of junior engineers and reports, in its turn, to a project manager. There is well communication between all levels between juniors and seniors and within juniors.

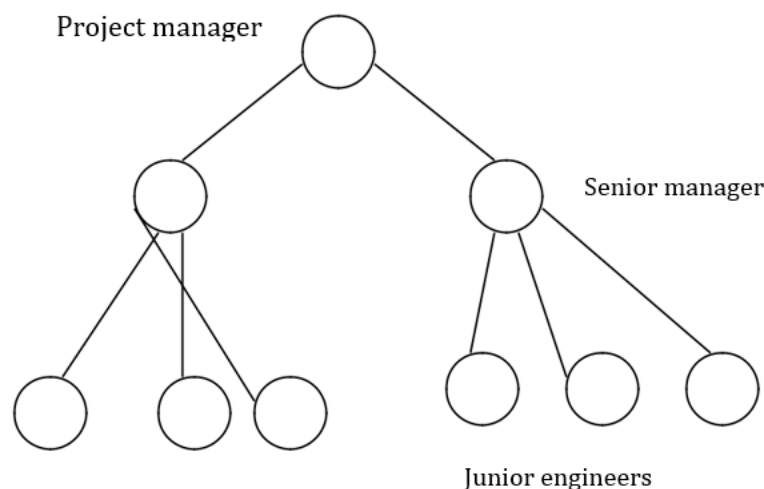


Fig. 9.3: (a) Management structure

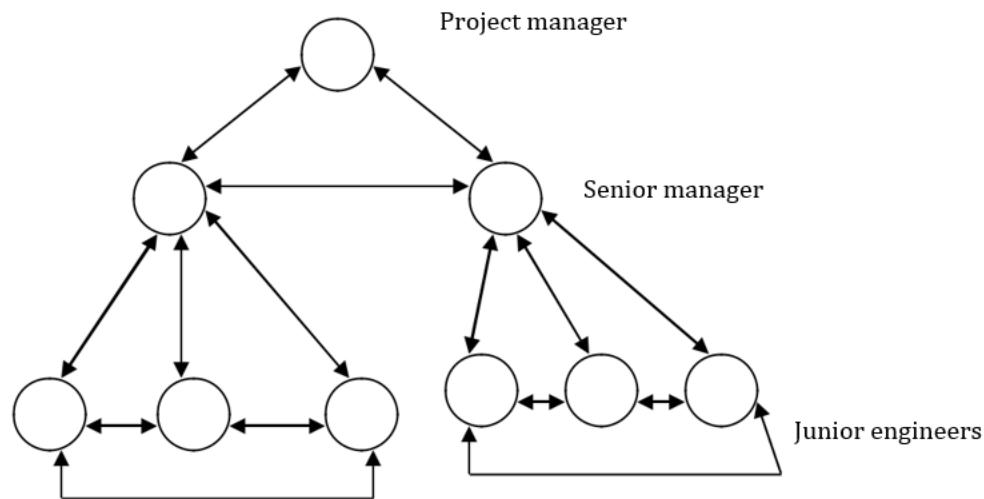


Fig. 9.3: (b) Patterns of communication

The benefit of mixed control organization is, it maintains communication within the group and provides the responsibilities of decision making to senior programmer. So that, it forms a good hierarchical organization structure and complex software development team.

A mixed-mode organization tries to limit communication to within a group that is most likely to benefit from it. It also tries to realize the benefits of group decision making by vesting authority in a group of senior programmers or architects. The mixed-control organization is an example of the use of a hierarchy to master the complexity of software development as well as organizational structure.

SELF-ASSESSMENT QUESTIONS - 1

1. The aim of an organizational structure is to facilitate cooperation towards a common goal. (True / False)
2. Cutting out unnecessary requirements in the software project is called_____.
3. _____ team organization attempts to combine the benefits of centralized and decentralized control, while minimizing or avoiding their disadvantages.

4. CASE STUDY 1: OPEN-SOURCE DEVELOPMENT TEAM ORGANIZATION

The open-source development approach is in some sense not suitable to commercial software development projects because of its reliance on (unpaid) volunteer developers and the lack of an organized schedule, but it is useful as a case study because of its ability to develop reliable and useful products.

The team organization is a mixed mode. Each module has a responsible person. Anyone may review the module and send in corrections and other contributions to the responsible person, who is the ultimate arbiter of what goes into the eventual release of the module.

One of the surprising conclusions of the open-source development organization has been that by increasing the number of people on a project, it is indeed possible to achieve more functionality in the product without overwhelming it with communication overhead. The underlying causes of the success of the approach are difficult to assess, but certainly the combination of democratic team organization the appointment of recognized “gurus” to be responsible for key decisions is essential factor.

5. AN ASSESSMENT OF TEAM ORGANIZATIONS

In the previous three subsections (9.3.1 to 9.3.3) we presented different ways of organizing software development teams. Each kind of organization discussed has its proponents and detractors. Each also has its appropriate place.

Experimental assessment of different organizational structures is difficult. It is clearly impractical to run large software development projects using two different types of organization just for the purpose of comparing the effectiveness of the two structures. While cost estimation models can be assessed on the basis of how well they predict actual software costs, an organizational structure cannot be assessed so easily, because one cannot compare the results achieved with those one would have achieved with a different organization.

Experiments have been run to measure the effects of such things as the size of the team and the complexity of the task on the effectiveness of development teams. In the choice of team organization, however, it appears that we must be content with the following general considerations:

- Just as no life cycle model is appropriate for all projects, no team organization is appropriate for all tasks.
- Decentralized control is best when communication among engineers is necessary for achieving a good solution.
- Centralized control is best when speed of development is the most important goal and the problem is well understood.
- An appropriate organization limits the amount of communication to what is necessary for achieving the goals of the project – no more and no less.
- An appropriate organization may have to take into account goals other speed of development, including lower life cycle costs, reduced personnel turnover, repeatability of the process, the development of junior engineers into senior engineers, and widespread dissemination of specialized knowledge and expertise among personnel.

6. CASE STUDY 2: NOKIA SOFTWARE FACTORIES

To cope with the huge growth of its business and the increasing importance of software in the development of mobile phones, the Nokia Corporation organizes its software development teams as "software factories." The Nokia software factories are based on four principles:

- *A geographically distributed environment.* A typical project consists of developers dispersed among three to four sites. Working synchronously is not always possible, because of differences in time zones.
- *Product family architecture.* Architecture is developed for an entire family and components are developed to be used in all family members.
- *Concurrent engineering.* Components are developed concurrently at different sites. To build a given product, the needed components are retrieved from various sites and combined in a central location. The parallel development of components shortens the time to market for the product.
- *The use of tools.* The process is supported by the use of tools, especially requirements engineering, design, coding, and version management, configure management, and testing.

7. TEAM DISCIPLINE

Team discipline consists of the following issues:

- Attendance
- Breaks/late coming/early going
- Punctuality, e.g. in attending meetings
- Late sitting/weekend work/shift work
- Leave planning
- Sharing resources
- Cost consciousness
- Avoiding waste
- Information sharing
- Confidentiality
- Record keeping
- Analytical approach
- Escalation of issues
- Representing organization
- Customer interaction

8. CONFLICT MANAGEMENT

A conflict occurs for various reasons. But each conflict should be resolved in proper time. Conflict management refers to the long-term management of intractable conflicts. It is the label for the variety of ways by which people handle grievances standing up for what they consider to be right and against what they consider to be wrong. The following list shows causes, resolution and confrontation.

Causes

- Priorities of different interest groups
- Scarcity of resources
- Concurrence on standards and procedures
- Work allocation – needs and expectations
- Personality clashes

Resolution

- Withdraw or retreat
- De-emphasize importance of disagreement
- Compromise
- Use force/power

Confrontation

- Recognize potential problems
- Try to identify and treat the cause
- Try team approach
- Try analytical approach
- Try emotional approach

1. Constant Conflict Avoidance: Delaying a decision could cause others to wait. Perhaps you are holding back the most promising individuals of your team. By avoiding today's conflict, you may be setting yourself up for more conflict in the future.
2. Involve other in your thought process: I can't seem to settle on a course of action. I'm curious to know your thoughts on the matter."Instead of going it alone and feeling isolated, consider the perspectives of those around you.
3. Simple ignore the issue: Getting a second opinion might be invaluable when trying to resolve a complex issue.You can go forward and make better decisions as a team rather than simply by yourself if you do this.
4. Shuttle diplomacy: Baynton use "shuttle diplomacy" to reduce workplace hostilities and identify solutions that work for everyone. In shuttle diplomacy, a facilitator meets privately with each party so that they can air their grievances and propose workable solutions.
5. Complete withdrawal from the situation: During that process, it becomes incumbent upon the facilitator to ferret out any hidden needs that may be standing in the way of a successful resolution
6. Psychological safety: Psychological safety may be especially crucial for people who tend to "flee" from danger, "clam up," "shut down," "hide," or "acquiesce" when faced with it.
7. Establish Healthy Disagreement Etiquette : Discuss and role model techniques for productive disagreement, such as active listening, restating the other person's viewpoint before responding with your own, and searching for areas of agreement even when you disagree. The motto "Seek first to understand, then to be understood" was posted in the break room as a constant reminder of the need of listening to the other person's perspective before formulating your own response.
8. Significant impact of team members: Team members' attitudes and dispositions can be greatly influenced by the environment in which they work. Modifying the meeting format by doing things like providing refreshments or holding it in a different location
9. Create a healthy conflict atmosphere: You can avoid potentially harmful conflict by instituting ground rules like "the group must remain standing if the discussion becomes prolonged."

10. Be positive: Work in a more positive environment by being a positive person yourself.

A positive attitude can go a long way towards making your workday more enjoyable.

Moreover, numerous studies have demonstrated that optimistic people are better equipped to handle pressure, worry, and difficulties.

11. Communicate Respectfully: The age-old adage "treat others as you would like to be treated" is a useful strategy for avoiding conflict in the workplace. Maintaining positive relationships with others can be accomplished by asking for help instead of giving orders, inquiring about others' weekends, and expressing gratitude for any assistance received.

12. Minor disagreement: A person who employs the strategy of "avoidance" typically tries to ignore or avoid the conflict in the hopes that it will go away on its own.

13. Collaborating: When we collaborate, we work together to discover a solution that works for everyone.

- The Thomas-Kilmann model distinguishes between two dimensions from which people choose conflict resolution strategies: cooperation and assertiveness

14. Emotional manipulation : Some people are used to gaining what they want by displaying strong emotions like anger, fear, or frustration. If they are successful in doing this at work, it will inevitably lead to animosity, arguments, and finger-pointing.

Types of Conflicts:

1. Team Conflict Resolution: Even in the most engaged workplaces, conflicts are unavoidable. Conflicts, regardless of their origin, have a negative impact on morale and productivity in the workplace if they are not resolved. In this article, we'll look at some conflict management scenarios and the fundamental conflict management skills you'll need to overcome them. The following abilities are crucial for resolving team conflict at work:

Build a thriving society. Be open and honest at all times, treat everyone on your team with respect, and give them plenty of praise and recognition.

Recognise the warning signals before a conflict escalates. Pay attention to the team's nonverbal cues, such as crossed arms, facial expressions, and tone of voice. Take swift action to resolve conflicts. Prevent the situation from escalating further by taking swift action to aid your people.

2. Compromising: The goal of "compromising" is to reach a solution that is acceptable to all parties involved, but which leaves some people unhappy.
3. Conflict with the boss: Constant conflicts between an employee and their superior typically arise when the latter lacks confidence in the former's abilities on the job. It's possible that the person has been overlooked for a promotion, or that their boss simply has a different vision of what the employee's responsibilities should be.
4. Conflict with direct Reporters or team members: If a team member appears to be slacking off and not pulling their weight, while their poor performance goes unchecked, it can lead to conflict with direct reports.

Changes in the workplace, such as a new boss or a peer being given more responsibility, can also spark conflict as employees adjust to the new circumstances.

How to resolve team conflict:

1. How to resolve with boss first: Team conflicts can be resolved in a number of ways, but it helps to have a firm grasp on the specific types of conflicts that are plaguing your workplace. In the event of a disagreement between a manager and an employee, it is essential that all parties involved get insight into the other's goals and motivations while being given the opportunity to voice their own.

For instance, the manager might not realise that the worker wanted more responsibility and instead saw their "micromanaging" of the worker as a precaution against the worker becoming overwhelmed by their workload.

2. How to resolve conflict with a colleague: Look for areas of agreement and try to come up with a solution that will please both parties. If not, ask for assistance from a higher-up in making the decision.

3. How to Manage Conflict in a Team: Last but not least, how do you resolve conflicts within the team? A disagreement that is allowed to fester amongst team members will eventually lead to snowball effects. Therefore, it is essential to have challenging conversations with the team members at an early stage. Think about problems dispassionately and set reasonable goals for yourself and your workplace in terms of output and behaviour.
4. Create a healthy conflict atmosphere: You can avoid potentially harmful conflict by instituting ground rules like "the group must remain standing if the discussion becomes prolonged."
5. Negative Outcomes: Conflict avoidance is a form of people-pleasing behaviour that originates from an irrational fear of upsetting other people. Many of these tendencies can be traced back to a dismissive or hypercritical upbringing.
6. Conflict avoidant : If you try to avoid any disagreement at all costs, you may end up suppressing your genuine sentiments and building up frustration, both of which can have a negative impact on your health.

Keeping negative emotions bottled up increases the chance of premature death, including death from cancer, according to a 2013 study from a reliable source.

Nervous laughter or putting on a fake smile might mask our true emotions, leading to feelings of isolation and depression.

7. Reframe: Making preparations in advance can help you feel more confident when confronting someone.

Practise delivering the clear, concise points you want to make to your supervisor or coworker until you feel comfortable doing so. Clearly state what you'd like to resolve before the conflict and put down a list of possible solutions.

8. Quickly relieve stress: Maintain composure in a tense situation by relying on your senses of sight, sound, touch, taste, and smell. Because of this, you'll be able to keep your cool in stressful situations.

Visual people, for instance, can get relief from stress by closing their eyes and visualising calming scenes.

9. Resolve Issues in Real-time: Instead of stewing over your problems indefinitely, try taking a more assertive tack.

To begin, state the problem in a neutral and factual manner by saying something like, "It appears I worked very hard on this project and yet my name was left out of the presentation."

If a coworker has taken credit for your work, approach them without being accusatory or defens

SELF-ASSESSMENT QUESTIONS - 2

4. Decentralized control is best when communication among engineers is necessary for achieving a good solution. (True / False)
5. _____ is best when speed of development is the most important goal and the problem is well understood.
6. _____ refers to the long-term management of intractable conflicts.

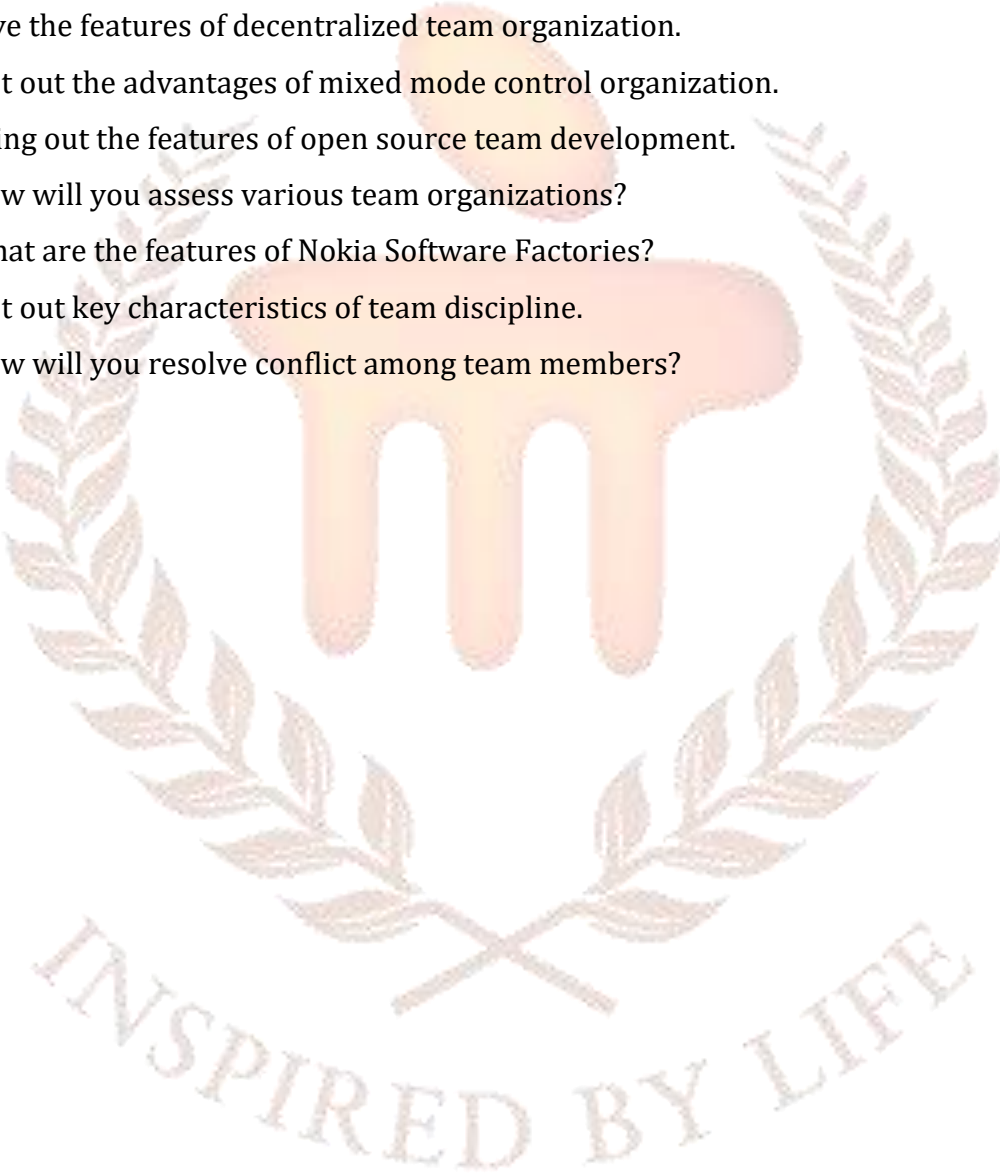
9. SUMMARY

Let's summarize important points discussed in this unit:

- This unit presented a concise view of the management approach towards controlling and managing the human resources, i.e., managing the group of software engineers.
- We have discussed about centralized, decentralized control and mixed control.
- In centralized control, several workers (i.e. software engineers) report to a supervisor who directly controls their tasks and is responsible for their performance.
- In decentralized approach decisions are made by consensus, and all work is considered group work. Team members review each other's work and are responsible as a group for what every member produces.
- A mixed-control team organization attempts to combine the benefits of centralized and decentralized control, while minimizing or avoiding their disadvantages.
- Also we have discussed about team discipline and conflict management. Unless we have team discipline the work cannot be finished in time. Similarly, conflict management also. Conflicts are inevitable. Somewhere around the system conflicts arises. But we have to find out the reasons for the conflict and should sort out properly.
- A manager has to accept the difficulties of the job and carefully evaluate the impact of any newly proposed panaceas.

10. TERMINAL QUESTIONS

1. What are the basic considerations in developing a software project?
2. Explain the need for various organizational types.
3. What do you mean by centralized team organization? Explain.
4. Give the features of decentralized team organization.
5. List out the advantages of mixed mode control organization.
6. Bring out the features of open source team development.
7. How will you assess various team organizations?
8. What are the features of Nokia Software Factories?
9. List out key characteristics of team discipline.
10. How will you resolve conflict among team members?



11. ANSWERS

Self Assessment Questions

1. True
2. Requirements Scrubbing
3. Mixed-Control
4. True
5. Centralized-Control
6. Conflict Management

Terminal Questions

1. Being not able to meet the schedule is the common problem the project manager has to face during the execution of the project. There are several reasons behind that; but the common problem one faces is the intellectual power that is in short supply. Finding the skilled developers needed for the project is always a very big challenge to address. It is as important to recognize that the right engineering talent can help. Thus, temporarily reassigning senior engineers to a part of the project that is suffering or hiring expert troubleshooting consultants are viable options. (Refer Section 2 for detail)
2. The organizing function of management deals with devising roles for individuals and assigning responsibility for accomplishing project goals. Organization is basically motivated by the need for cooperation when the goals are not achievable by a single individual in a reasonable amount of time. An organizational structure is necessary at any level of an enterprise, whether it is to coordinate the efforts of a group of vice presidents who report to the president of the corporation or to orchestrate the interactions among programmers who report to a common project manager. (Refer Section 3)
3. Centralized-control team organization can also be considered as the hierarchical structure. In this type of the organization the reporting structure will be rather rigid and flows from bottom to top. Centralized-control structure is quite popular method and has been in practice for a long time and well understood across the industry. In this

type of organization several workers report to a supervisor, who in turn might report to departmental head at next level and so on. The performance of one level of the resources is monitored only by immediate manager in the organization. (Refer Sub-section 3.1)

4. The decentralized-control structure emphasizes more on team collaboration and less on hierarchical flow of the control. Here the team work is played vital role and the decisions are made based on consensus among the team members. (Refer Sub-section 3.2)
5. A mixed-control team organization attempts to combine the benefits of centralized and decentralized control, while minimizing or avoiding their disadvantages. Rather than treating all members the same, as in a decentralized organization, or treating single individual as the chief, as in a centralized organization, the mixed organization differentiates the engineers into senior and junior engineers. Each senior engineer leads a group of junior engineers and reports, in its turn, to a project manager. Control is vested in the project manager and senior programmers, while communication is decentralized among each set of individuals, peers, and their immediate supervisors. (Refer Sub-section 3.3)
6. In open source development, the team organization is a mixed mode. Each module has a responsible person. Anyone may review the module and send in corrections and other contributions to the responsible person, who is the ultimate arbiter of what goes into the eventual release of the module. (Refer Section 4)
7. Experimental assessment of different organizational structures is difficult. It is clearly impractical to run large software development projects using two different types of organization just for the purpose of comparing the effectiveness of the two structures. While cost estimation models can be assessed on the basis of how well they predict actual software costs, an organizational structure cannot be assessed so easily, because one cannot compare the results achieved with those one would have achieved with a different organization. (Refer Section 5)
8. The Nokia software factories are based on four principles:
 - A geographically distributed environment.
 - Product family architecture.

- Concurrent engineering.
- The use of tools. (Refer Section 6)

9. Team discipline consists of the following issues:

- Attendance
- Breaks/late coming/early going
- Punctuality, e.g. in attending meetings
- Late sitting/weekend work/shift work
- Leave planning (Refer Section 7)

10. A conflict occurs for various reasons. But each conflict should be resolved in proper time. Conflict management refers to the long-term management of intractable conflicts. It is the label for the variety of ways by which people handle grievances standing up for what they consider to be right and against what they consider to be wrong. (Refer Section.8)