UNIT 4 : Project Management Plan and Configuration Management

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Unit	**Unit Name**	**Sub Unit**	**Topics**	**Reference Chapter/Additional Reading**
4.	Project Management Plan and Configuration Management	4.1	Introduction to Project Management Plan	PJ#9 Page No 175-178 ,SPMIP#6, Page No. 95
		4.2	Configuration Management Concepts	PJ#10 Page No 195-200, SPMIP#6, Page No. 96
		4.3	Configuration Management Process	PJ#10 Page No 200-206, SPMIP#6, Page No. 99
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4.1 Introduction to Project Management Plan

- The output from the planning activity are put together in a project management plan document, which is the main document guiding of the project, along with the project schedule.
- Three type of use of the project management plan:
    - Business manager of the project to whom the project leader reports.
    - Project leader who is also the owner of this document
    - Developers in to project

- Project management plan is required by the CMM level 2 SPP, SPTO KPAs, CMM level 3 ISM, PR, IC KPAs and CMM level 4 QPM, SQM.
- Project Management Plan (PMP) includes four major section:
    - First section consist of **project summary**
    - Second section entitled **project planning**
    - Third section entitled **project tracking**
    Fourth section **describes roles and responsibilities of various people.**
- **Project Summary**
    - It gives high level overview of project.
    - It include following information's:
        - start and end dates of the project
        - the project leader
        - contacts at the customer end
        - project objectives
        - major commitments made on the customer
            - All intermediate commitments are mentioned as milestones. They are ***"External mile stones".***
        - Assumption made.
            - The assumption must be explicitly listed because they frequently serve as the source of risks in the project and can help in risk management.
- **Project Planning**
    - It gives output of executing the various project planning procedures.
    - It specify the life cycle of project.
    - Tailoring guideline permit the life-cycle process to be modified in a controlled manner.
    - If project process can not to obtain by applying tailoring guidelines to the standard process, then the necessary

modifications to the process can made and these deviations are highlighted in PMP as ***"tailoring notes".***

- In the PMP, the estimates and their basis are captured.
- The development environment needs, tools employed and other requirements for the project are captured with project specific training plan.
- The quality plan and risk management plan are also given in PMP.
- The PMP also lists project milestones.

- **Project Tracking**
  - It involves monitoring activities, issues, quality and other aspects of the project.
    - How activities, issues and customer feedback will be tracked is specified.
    - Policies regarding who will log the information, who will review it, who will close the activities, when they will be escalated and so on are mentioned.
    - Various type of status reporting is also specified.
  - The focus of the project tracking mechanism is capturing and resolving problems at the project level.
    - If it can not be solved at project level then mechanisms must exist to take them to the "higher-ups" for resolution.
    - For this purpose the escalation channel are specified in the PMP(it is at both the customer's and Infosys's ends)

  - **Team**
    - The project team must be properly organized to achieve optimal performance..
    - At Infosys, generally a hierarchical team structure is employed
      - This team is leaded by the project leader(PL)
  - The PL reports to the business manager (BM) and the customer representative.

- The PL may have either module leader or developers (DVs) as subordinates.
  - The configuration controller (CC) and database administrator (DBA) typically report to PL.
- The team organized for the project is specified in PMP.
  - The logical responsibilities of each person are detailed, along with the start and end date for each person.
  - A team member may have multiple responsibilities.

4.2 Configuration Management Concepts

- Configuration management is also known as software configuration management.
  - It is the aspect of project management that focuses exclusively on systematically controlling the changes that occur during the project.
- CM is also needed to satisfy one of the basic objectives of the project-delivery of high-quality software product to the client.
- What is this "software" that is delivered?
  - It contains various source or object files that make up the source or object code, scripts to build the working system from these files, and associated documents.
- How does ensure that the appropriate version of sources are combined and that no sources is missed?
  - For these types of situations, item and their versions must be properly tracked, along with the version of software product.
- Without this information, delivering the "Final: system itself will become a difficult task.
- This activity is not part of PM, but it is consider the part of CM.
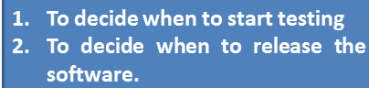- CM applies at Level 2.

- **Life cycle of an item**
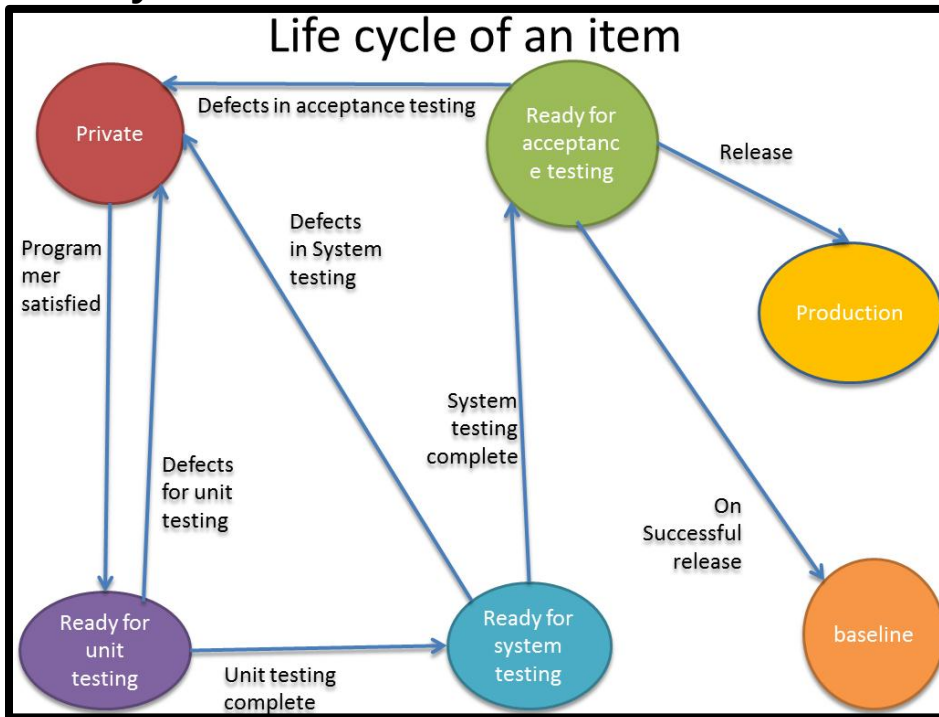
- At the beginning, when a programmer develops it, the program is under development ("private").
- Once programmer is satisfied with the program, the program moves into the "ready to UT" state.
- After UT, the programmer must fix any defects found.
- If UT succeeds, then its state changes to "ready for ST".
- If defects are found, the state of a program reverts back to "private" otherwise it moves to "ready for AT".
- If it succeeds, then the state of all programs changes to "ready for Release".
- Once a program is released, and is in production use, then all the programs move to "baseline state", which represents the state of the production system.
- Primary objective of CM is to manage the evolving configuration of the software system.
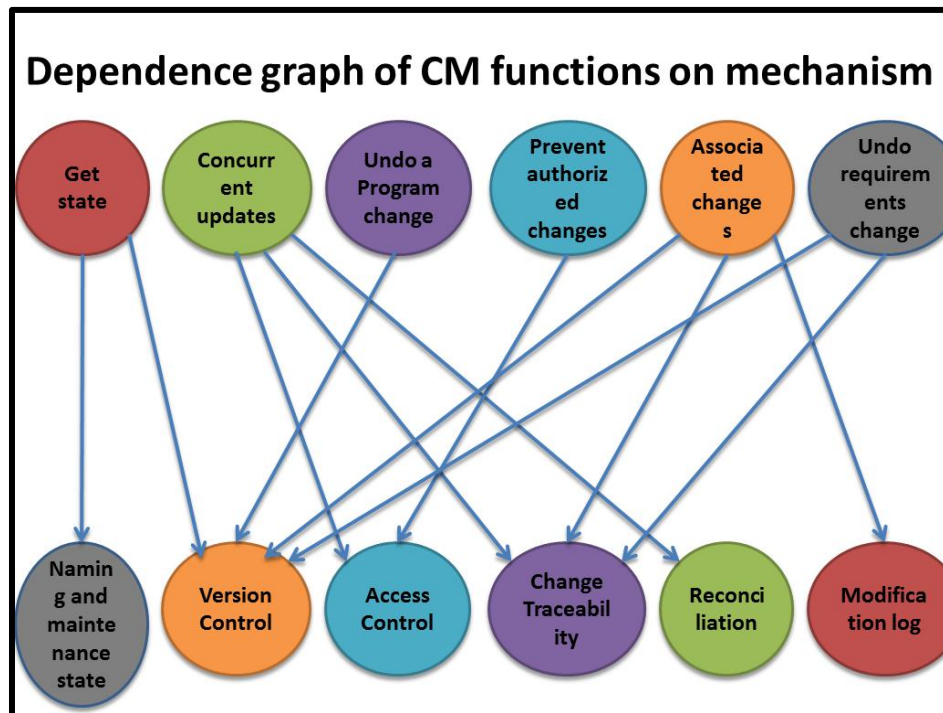
- To better understand CM, let us consider what functionality a project requires from it.

  1. To decide when to start testing
  2. To decide when to release the software.

  - Give states of programs.
  - Give latest version of a program.
  - Handle Concurrent update Requests.
  - Undo a program change.0020
  - Prevent Unauthorized Changes or Deletions.
  - Provide traceability between requirement change requests and program changes.
  - Undo a requirement change.
  - Show associated changes.
  - Gather all sources, documents and other information for the current system
- The mechanisms commonly used to provide the necessary functionality include the following:
  - Naming conventions and organization of files.
    - It helps in finding a desire file quickly
  - Version control
    - It helps preserve older versions of programs whenever programs are changed.
  - Change request traceability
    - It provide mapping from a requirement change request to subsequent changes in programs.
    - It helps in managing requirement changes.
  - Access control
    - It ensures that only authorized people can modify some files.
  - Reconciliation procedures
    - It specifies how two changes made independently to a program can be merged to create a new version that reflects both.
  - Modification log in programs

- **CM functions on mechanism relation**

Dependence graph of CM functions on mechanism

- Get state
- Concurrent updates
- Undo a Program change
- Prevent authorized changes
- Associated changes
- Undo requirements change

- Naming and maintenance state
- Version Control
- Access Control
- Change Traceability
- Reconciliation
- Modification log

4.3 Configuration Management Process

- CM process defines the sequence of activities that needed to be performed in support of the CM mechanisms.
- At Infosys, the main stages in the CM process are as follows:
  - o Plan and set up configurations management.
    - ▪ Identify those items that need to be under CM, locations to store them, procedure for change control.
  - o Perform configuration control.
    - ▪ Process has to be executed using some deploying tool.
  - o Monitor the status of configuration items.
    - ▪ Tool requires self-discipline from the project personnel in terms of maintaining version, storing items in proper location and making changes properly.

- In addition CM audits are performed to help in the implementation of the CM process.
- **Plan and Set Up Configuration Management**
  - It involves identifying the configuration items and specifying the procedures to be used for controlling and implementing changes to these configuration items.
    - Typical example of configuration items include requirements specifications, design documents, source code, test plans, test scripts, test procedures, test data, standard used in project, the acceptance plan, CM plan, project plan, user manual, training material, contract document, quality records and CM records.
  - To facilitate proper naming of configuration items with version number, the naming conventions of CM item are decided during CM planning stage.
  - During planning, it must be decided how to maintain the state of a program.
    - Best approach of collecting item in different states is to create separate directories of them.
  - The planning is done by project leader and CC (or CCB- Configuration Control Board).
    - Where a large teams or where two to more teams/groups are involved in the development of the same or different portions of the software at that time CCB is requires.
      - It involves representative of each of team.
    - CC is responsible for the implementation of the CM activities within the project.
    - CC is also responsible for managing release, archiving of the release, retrieving and releasing appropriate version when required.
  - Planning can be start only when the project has been initiated and operating environments and requirements specifications are clearly documented.

- Following activities are included in this stage:
  - Identify configuration item, including customer-supplied and purchase item.
  -      define the naming and numbering scheme for the configuration items.
  - Define directory structure needed for CM.
  - Define access restrictions.
  - Define change control procedures.
  - Identify and define the responsibility and authority for CC/CCB.
  - Define a method for tracking the status of configuration items.
  - Define a backup procedure.
  - Define reconciliation procedure, if needed.
  - Define a release procedure.
  - Define an archive procedure.
  - Identify points at which the configuration item will be moved to the baseline.
- The output of this phase is CM plan.
- Policies and procedures for change control are also established during planning.
  - In change control we made changes to a program to fix bugs found during various testing activity.
  - Requirement change requires, may require that many programs be changed.
  - For that, an impact analysis carried out.
  - For each change request different spreadsheet developed, that has lists all item that have to be changed as well as the directory for each item.
- If concurrent updates to programs are to be allowed, the reconciliation procedure must be specified.

			Area			
Date	Work Product Name		Development	UT	ST	Baseline

- **Perform Configuration Control**
  - Two main activities are performed
  - Deal with managing the state transitions of programs.
    - State transition management involves moving item from one directory to another when the state changes, creating version when changes are made, and ensuring that each program goes through its life cycle and reaches the baseline.
    - For state transition management ,tools are used to manage the state and version of item.
      - A program is considered to be in a _**"Controlled environment"**._
  - Deal with managing the change requests that must be implemented.
  - To make an approved change, the program is checked out of the controlled environment earlier
    - It implies making a copy of the item, without destroying the earlier version and making a note that the item has been checked out.
    - Modifications must be reflected in the controlled environment.
  - To provide information regarding what changes have been made, a modification log may be kept in the program source itself.
    - This log essentially identifies the start and end of a change and includes a reference to the change request that prompted it.
  - To implement requirement changes, which in turn trigger changes to configuration items, a change request is first analyzed by performing an impact analysis.

- Following activities are part of implementing a change request:
    - Accept the change request
    - Set up a tracking mechanism
    - Check out configuration items that need to be changed and perform the changes.
    - Check in configuration items
    - Take the item through its life cycle.
- **Status Monitoring and Audits**
    - When we not use any type of tool ,and a mechanism based on a directory structure is used to represent the state of program, mistake are possible**.**
        - It requires that the programs be moved properly from one directory to another where their state changes and that this change of state be reflect in master table that maintain the state of the various item.
            - To minimize this regular status checking of the configuration item is done.
        - Finally a configuration audit may be performed.
        - As in other audits, the main focus here is to ensure that the CM process of the project is indeed being followed.
        - The baseline for the system may also be audited to ensure that its integrity is not being violated and the movement of item to and from the baseline occurs in a manner consistent with the CM plans.

4.4 Document Control
- In any organization documents have to be created, distributed and maintained so as to support easy, but controlled access.
- Two major types of documents that need to be controlled are those

- Related to process definition
- Project documents
- Once created, documents have to be reviewed and authorized.
  - Review is done by someone other than the author of the document.
- Once document has been reviewed and approved, it may be a baseline.
  - After being baselined, the document may be altered
  - The procedure for such a change requires that a modification request first raise.
  - Once the request is accepted the change is evaluated and affected documents are identified.
- General rules for controlling changes to document apply:
  - Any change that affects the form, fit or function of the document is considered a major change; otherwise it is a minor change.
    - Minor changes may be accumulated before a document is actually taken up for modification
  - Approval of changes is done by the same function that performed the original approval, unless specifically designated otherwise.
  - The version number of the next issue of the document is determining by the extent of changes. Each set of modifications is accompanied by a change in the version number.
  - A revision list is maintained in the document itself, which gives a history of changes made to the document.
- A document numbering scheme is also recommended so that each document has a **unique reference number**.

- To ensure some consistency, documentation standards have been specified.
  - This standard provides a framework for the layout and design of documents generated within the organization.
- Infosys, standards requires that any document should include the following sections:
  - Title page
    - It contains title of document, its version number, name of author, name of authorizer, date of issue.
    - Version number is a two-digit number, followed by a period, followed by another two-digit number
  - Revision list
    - It gives the history of revision to the documents.
  - Table of contents
    - It contains entries for all chapter and the main section and subsection within each chapter.
  - Main body of the document
  - References
  - Appendices
  - Index
- Document Control also addresses the issue of circulation and access. It fall in one of the following category:
  - Proprietary
    - Circulation is restricted to a defined set of individuals.
  - Limited
    - Circulation is limited to the group of individuals whose duties are directly related to the documents.
  - Unlimited
    - These documents are intended for general circulations.

- Copies of any type of document could be either controlled or uncontrolled.
  - Controlled copies are issued to a limited set of people.
    - Each controlled copy allows a unique number and is assigned to an individual by name.
    - That information clearly marked as a controlled copy.
  - ***<u>Master distribution list</u>*** of controlled copies is maintained by the issuing authority
    - It specifies the people to whom copies of the document should be sent.
  - Uncontrolled copies are created for a specific reason and are expected to be destroyed after their purpose is fulfilled.