**Learning Journal**

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**Course:** SOFTWARE PROJECT MANAGEMENT

**Journal URL:** https://github.com/divyasri5i0/SPM-Winter2025

**Dates Rage of activities**: [WEEK-3] 10 FEB 2025 – 23 FEB 2025

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**Key Concepts Learned**:

* Learned the key concepts of Configuration Management System (CMS), which is a structured process that helps manage change requests and different versions of software product efficiently.
* A CMS is a set of processes and tools used to track, control, and document changes in software projects like:
* What changes are made?
* Who made the changes?
* Why the changes are made?
* When are the changes made?
* Requirements of Configuration Management System (CMS)
* **Version Control**: Prevents conflicts by maintaining a history of changes.
* **Collaboration**: Helps teams work on the same project without overwriting changes.
* **Traceability**: Ensures every change is recorded and can be traced back to a requirement or issue.
* **Error Reduction**: Minimizes misconfigurations and helps in debugging.
* **Compliance**: Ensures that regulatory and quality standards are met.
* **Auditable**: maintains detailed history of changes, making it possible to track who made the modifications, what changes are made and when are the changes made.
* **Secure**: SCM ensures access control, authentication, authorization to prevent un-authorized changes.
* **Centrally Located** – SCM provides a central repository where all configuration items (source code, documents, libraries) are stored. This enables team members to work collaboratively while maintaining a single source of truth.
* Key Functions of Configuration Management System (CMS):

IDENTIFICATION

CHANGE CONTROL

**CM**

STATUS ACCOUNTING

AUDITING

* Configuration Identification: defines and records Configuration Items, which include source code, documents, libraries, data base and hardware components. Key activities include:
* Identifying configuration Items
* Defining Baselines
* Documenting Dependencies
* Creating naming conventions
  + Change Control: This phase ensures that changes to configuration items are systematically managed through formal approval processes and version control mechanisms. Major activities include:
* Change Request Management
* Version control
* Branching and merging
* Impact analysis
  + Configuration Status Accounting: This phase tracks and maintains records of all configuration items, changes, and releases throughout the software lifecycle. Key activities include:
* Maintain product description Records
* Maintain Configuration Verification Records
* Maintain change status records
* Maintain history of change approvals
  + Auditing: This phase ensures that the configuration management process is followed correctly and that system components comply with established requirements. Activities include:
* Formal qualification review
* Physical configuration audits
* Functional configuration audits
* Gained knowledge of **Project Planning** concepts, which defines a project's scope, objectives, tasks, timeline, resources, and risks to ensure successful execution. It serves as a roadmap for project teams, helping them stay organized and aligned with goals.
* Project planning components:
* Resource planning
* Schedule planning
* Effort estimation
* Cost estimation
* Communication on planning
* Configuration management planning
* Tools planning
* Supplier planning
* Scope planning
* Quality planning
* Risk planning
* Project planning consists of project scheduling, project budgeting, manpower planning, communication planning, quality planning etc.
* Project scheduling can be done in 2 ways. Top-down planning and bottom-up planning. To apply these techniques, we need to break the entire project work into manageable small tasks which is known as Work breakdown structure (WBS).
* WBS also maintains relationship among tasks so that it is possible to know which tasks precede another tasks, which tasks cannot start before completion of some other task etc.
* When the WBS structure for tasks is established, you can assign resources to each task. The allocation of resources should focus on aligning the necessary skills with those that are available.
* The number of resources assigned to a task will depend on the level of effort needed and the duration the task is expected to take.
* **Project activities** - the basic planning element. Each activity has:
* **Duration -** in calendar days or months
* **Effort estimate** - which shows the number of person-days or person-months to complete the work
* **Deadline -** by which the activity should be complete
* **Defined end-point** - which might be a document, the holding of a review meeting, the successful execution of all tests, etc.
* **Milestones -** key points in a project's timeline that mark significant events or decision points. They help measure progress and keep the project on track.
* **Deliverables -** the products or services that are produced as a result of a project. Deliverables can be tangible or intangible, and they can be internal or external.
* **Critical Path** - path through the network joining those critical activities.
* The critical path is determined by adding the times for the activities in each sequence and **determining the longest path** in the project.
* If activities outside the critical path speed up or slow down (within limits), the total project time does not change.

**Application in Real Projects:**

Configuration Management real world applications

1.Software Development:

* **Version Control:** CM tools like Git and SVN are used to manage different versions of source code. This ensures that developers can collaborate without overwriting each other’s work and allows for easy rollbacks if bugs are introduced.
* **Environment Consistency:** CM helps maintain consistent development, testing, and production environments.

2**.**Manufacturing/Engineering:

* **Product Lifecycle Management (PLM):** In industries like aerospace or automotive, CM is used to manage the configuration of complex products like airplanes or cars, where each part needs to be tracked
* **Change Control Process:** In real projects, whenever a change is requested (e.g., a design change, material change), CM ensures that the modification is evaluated, tested, and approved before being implemented, keeping the project on track.

Project Planning concepts in real projects

1.Work Breakdown Structure (WBS): In construction or software development, the WBS breaks down the project into smaller, manageable tasks.

2.Resource Allocation: In real projects, ensuring that the right resources (people, equipment, materials) are available at the right time is critical. Tools like Microsoft Project or Asana help manage resource allocation by visualizing dependencies and ensuring that resources are not over-allocated or underutilized.

**Peer Interactions:**

* peer-to-peer interaction helped in understanding the concept in a better way which is so helpful for overall subject analysis.
* Peer interactions not only brushed up my knowledge but also helped me in improving my communication skills.
* We discussed how Configuration Management and Work Breakdown Structure can be used in our projects for better understanding and representation.
* We are trying to apply the concepts of CM in our projects to monitor the changes together and verify who made the changes.
* This encouraged open discussions and knowledge sharing among us.
* We are following Inter-Departmental Collaboration where proper coordination leads to smoother project progress, reduced delays, and ensures that each team can function without bottlenecks.

**Challenges Faced:**

* Dependency Management was hard in the beginning as I was trying to incorporate the work flow and structure of configuration management, which was later resolved by diving deeper in to the concepts.
* Complex Terminology and Concepts in Configuration Management is hard to memorise an apply.
* Grasping how the change control process works, especially the evaluation, testing, and approval stages, is confusing.
* Estimating the time and resources required for tasks in a project is notoriously difficult, especially in software development, where many tasks are unpredictable.

**Personal Development Activities:**

* Spending time on reading Lecture notes which is making Lecture Journals easy to finish and also giving me better understanding about Software Project Management, day by day.
* This knowledge and peer interactions helped me to give a good presentation and score well in my recent topic Analysis where I clearly made 6 relevant and valid points for the posture.
* Connecting to peers developed my communication skills which helped me personally develop as a good presenter and speaker.
* Started to connect with people which is helping me improve my way of thinking broadly and improve my performance.
* These Lecture journals not only helped me to gain knowledge in SPM but also motivated me to spend at least 2-3 hrs a day journaling on other subjects as well, which made it easy for me to tackle tests and assignments.

**Goals for the Next Week:**

* I want to master Software Configuration Management techniques and apply them in my project.
* Next week I want to primarily focus on my deep understanding of project and work towards Project deliverable 2.
* I want to go through chapter overall to grasp the topics.
* I am focusing on the above concepts to avoid confusion and to better understand the concepts.
* I am preparing to give a good pitchers presentation for SPM.