SOEN 6841 - Software Project Management

Learning Journal [Feb 11 to Feb 17]

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Course - SOEN 6841 [Software Project Management]

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Key Concepts Learned:

In this week I learned Configuration Management and Project Planning.

-> Firstly I learned about **Configuration Management**. It is essential for storing, organizing, and managing project artifacts throughout the software development lifecycle. It acts as a centralized repository accessible to all project stakeholders, facilitating collaboration and version control. This ensures that all team members have access to the latest version of the project assets, regardless of their location.

-> Then I learnt some of the tags used for document while saving in Configuration Management System. Tags provide a unique identifier for each information item, allowing them to be easily distinguished and referenced within the configuration management system. They are also used for organising and categorising information.They are,

a) Project Name
b) Year and Time Stamp
c) Document Name
d) Document Number
e) Author
f) Activity Identifier
g) Document Type
h) Version Number

-> Also I learned about **Configuration Management Techniques**.

1. **Centralized Configuration Management System:** A single repository where all project files and resources are stored and managed, ensuring all team members have access to the latest versions and facilitating collaboration.

2. **Secured Access Mechanism with Role-Based Access Control**: An access control system that assigns permissions based on roles (like developer, tester) to ensure that only authorized individuals can access specific project resources, enhancing security and minimizing risks.

3. **Continuous Integration (CI) with Smoke Test Facility:** The practice of frequently integrating code changes into a shared repository, integrated with automated tests (smoke tests) to quickly detect defects or regressions, ensuring software stability and functionality.

4. **Easy Branching Mechanism:** The ability to create separate lines of development (branches) from the main codebase, facilitating parallel work on features or fixes and enabling collaboration without disrupting the main development line.

5. **Audit Facility:** A feature that tracks and records changes made to project artifacts, including details such as who made the changes and when, providing accountability, transparency, and compliance with regulatory requirements.

-> Then I learned about **Project Planning**. Planning a project is one of the most important step in Software Development. Before starting a project, project owner, team members, stake holders must develop a proper project plan, so that they can deliver the project on time without any delay or failure.

-> I learned about **Type of Project Planning**. Top Down Project Planning and Bottom Up Project Planning. Top-down approach is driven by fixed release dates and predetermined features to meet market demands. In Bottom-up approach, the project team estimates development time based on requirements and sets the release date accordingly.

-> Also I learned about **Work Breakdown Structure**. It is a hierarchical representation of all project tasks, crucial for effective project planning and management. While listing all tasks in a project plan is essential, it can be challenging to find task dependencies, critical path items, and milestones without proper organization. To address this, tasks belonging to the same project phase are grouped under a pseudo task representing that phase, with the last task in each phase serving as a milestone. Project management software like Microsoft Project, Jira allows these grouped tasks to be collapsed under their parent pseudo task, simplifying navigation and readability. This structured approach to the WBS enhances project clarity, facilitates communication, and supports efficient project control and decision-making.

-> I also got to know about **Resource Allocation for a project**. It is one of important step during development of a project. Uneven allocation of resource will leads to failure of the project. Most of the resource should be allocated during Project Construction phase as it involves extensive work like interacting with customers, developing the project as per the customer requirement. Also right amount of resource should be allocated for Quality Assurance. After developing a feature, quality assurance team should test that completely and if they approve, it should be pushed to the production stage.

-> I learned about **Iteration Planning** based on a concept called Velocity**.** It is measured in terms of feature points completed per iteration. Feature points are assigned to each software feature based on its size and complexity. Velocity helps project managers forecast the number of iterations required for a given set of features, allowing for better resource allocation and scheduling.

-> I also learned about **Project Management Office (PMO**). They play a crucial role in overseeing and coordinating project management activities across an organization. Its functions include resource planning, budgeting, infrastructure management, and project monitoring and control. By centralizing project management efforts, PMOs ensure consistency, efficiency, and alignment with organizational goals.

Application in Real World Projects:

a) Using Version Control System:

We can use Version Control System like Git to manage the project so that each developer have their own local copy in the system and a remote repository. Developer can use the local copy, develop new features and if everything works well, they can push it to remote repository. VCS is very helpful as it manages the different version of the projects using core functionality like Trees, Indexes etc… Also developers working in different location can easily get the newly updated code made by some other developer instantly. Also we can set different level of permission for the remote repository so that project is stored securely and allowing authenticated users to read and write the repository.

b) Using Role Based Access Control for highly secured projects:

Project which are highly secured like Government Internal Working Website, Fin-Tech Application etc… proper security mechanism should be formed before developing the project. Role Based Access Control technique can be used where different level of permission

is provided for developers, testers, project stake holders, enabling secure collaboration with data protection regulations.

c) Using CI/CD pipelines for Agile Project Development:

CI/CD pipelines to automate the process of building, testing, and deploying software changes iteratively. These pipelines enable teams to work on small, frequent changes, integrating them into the main codebase multiple times a day, while automated tests validate the correctness of the code. With CD, validated changes are automatically deployed to production environments and promotes collaboration among developers, testers, and operations teams.

d) Using Automated Test [Smoke Test]:

Automated testing execute some predefined test cases automatically, verifying the functionality and performance of a software application. Some of the automated testing frameworks are Selenium and LoadRunner etc… Selenium facilitates functional testing by automating user interactions, ensuring critical functionalities like product search and checkout processes work seamlessly across different browsers and devices. LoadRunner enables performance testing by simulating high volumes of user traffic, identifying and resolving performance bottlenecks to ensure the platform's scalability during peak periods.

e) Agile Iteration Project Planning:

Agile Iteration planning can be used which allows the project to completed quickly with high customer satisfaction. In Agile project planning, project will be developed in sprints where each sprint last for 2 weeks. In that 2 weeks, developers will focus on a building a particular feature, test it and deploy it. With help of this, customer can test their project continuously after each sprint and provide early feedback to the development team, so that they will work accordingly.

f) Using Project Management Office for Enterprise Applications:

Health care and Finance projects require careful planning and governance to ensure adherence to legal and industry standards. A PMO can provide governance for these type of projects by establishing policies, procedures, and controls to mitigate risks and ensure compliance with relevant regulations. In this way, developers can fully focus on developing the application based the Project Management Office guidelines without worrying about these regulatory details.

Peer Interactions:

- I discussed on how to set up configuration management for a project from scratch. Read some articles, blogs on how to set the dependency file for a project that will be updated while developing the project. Also I saw some open source project's configuration management files and folders and got some insights from them.

- Discusses about Agile Project Planning in depth and how they works in real time. Also we discussed regarding role of Scrum master and how agile sprints works in a company. We came to know that after following Agile methodology, most of the companies delivered the project on time, developers solely focused on developing features selected for that sprint cycle instead of working on all features at once.

- Also Me and my team got ready for our project pitch presentation. We did a bunch of research and practiced our presentation. During our meetings, we talked about what our project is about, what we're going to do, and who's doing what. We also conducted Market survey of our project, how to allocate budget, and also planned the Agile Methodology for our project delivery.

Challenges Faced:

- After reading a article on setting up CI/CD on a project, I saw a CI/CD pipeline set up of a complex open source project and it was quite difficult on the internal things works.

- For what type of projects, Project Management Office should be formed?

- How to overcome the Resource Allocation failure of a project. I learned about Resource Allocation, various techniques in allocating a resource. But sometimes, resource allocation will not be accurate. I am going to explore in depth about the strategies and steps that be be followed when resource allocation failure occurs.

Personal Development Activities:

- I explored additional resources on configuration management techniques and best practices, such as online tutorials, blogs and implemented a configuration management technique on one of my personal project.

- Read some case studies uploaded by the professor, and also discussed my approach of solving it with my friend.

- Also I explored about Project Planning in Agile Methods and watched some videos regarding that topic. I got to know about the role of product mangers and how he plans a project. Also I learned on how to calculate the number of sprints for a project.

- I also attended a webinar on “Mastering the public speaking skill”. It helped a lot to break my barrier to speak in front of public with confidence. Also I am planning to attend more webinars in the upcoming weeks.

Goals for next week:

- I am planning to further study on implementing CI/CD pipleline for complex projects. Will refer online tutorial, videos and gain in depth knowledge on this topic.

- Also I will be preparing for my mid term exam. Will be reading the lecture notes, e-Book mentioned by the professor and watch some tutorial videos on some of the complex topics.