**CMM LEVEL 2 → 3**

**Roles:**

Owner/Project-Manager – Rochak Kunwar

Secretary – Stan and Sally

UX Designer – Ursula and Xavier

Engineers – Teri, Abe, Britney, Claire, Doug, Emily, Frank, Grace, Holly, Ingrid, Jack, Keith, and Larry.

1. **Organization Process Focus:**
   1. The software process is assessed periodically, and action plans are developed to address the assessment findings.

Under Ursula, a survey assessment will be performed about the software process being used currently. The response from all the developers and designers will be recorded and prioritized and the most important change that needs to be done will be assigned to Abe and Britney to implement in the company.

* 1. The organization develops and maintains a plan for its software process development and improvement activities.

Abe and Britney will start implementing the changes recorded from the assessment. They will discuss with some other team people and seniors before implementing their new plans. They will come up with some activities which will be performed during development process which should lift the quality of the final software produced.

* 1. The organization's and projects' activities for developing and improving their software processes are coordinated at the organization level.

Since our team is small and we don’t have enough people to apply our new designed activities to test its effect in the software process, we will do some trial period for about a week or even longer if needed to apply our new designed activities. After we get approval from managers, seniors, and pairs we will implement this new process in the whole organization permanently for developing and improving the software quality process.

* 1. The use of the organization's software process database is coordinated at the organizational level.

The new software development and process database that have been predicted and generated over the testing phase(Activity b) and scaled for the whole organization(Activity c) will be shared in all organization. The estimation of software size, cost of making it, effort, quality requirement is shared with all the members in the company.

* 1. New processes, methods, and tools in limited use in the organization are monitored, evaluated, and, where appropriate, transferred to other parts of the organization

Our team works in an agile method. We have a whole team working as a single team. The activities and new process drafted will be evaluated and if needed can be thrown out too.

* 1. Training for the organization's and projects' software processes are coordinated across the organization.

Abe will be responsible for implementing new software development process, and training developers about new software process design. If needed the training can be performed by an external entity.

* 1. The groups involved in implementing the software processes are informed of the organization's and projects' activities for software process development and improvement.

It is done by a single person Abe. It will be done in a meeting.

1. **Organization Process Definition:**
   1. The organization's standard software process is developed and maintained according to a documented procedure

The Software process developed by Abe will be made standard to satisfy the product standard and customer expectations. The standard will be fixed and higher than the level-2. The new tools and methods will be standardized among the members of the company. Everyone will be required to follow this methodology.

* 1. The organization's standard software process is documented according to established organization standards

**Teri** will be responsible for documenting all the standard procedures that will be followed now onward in the company. Each phase of the software development like requirement, testing, development, database including the new tools and framework that will be used for software development will be detail documented.

* 1. Descriptions of software life cycles that are approved for use by the projects are documented and maintained.

The software life cycle which is allowed by the project at level 3 will be documented. If certain changes needed to be done in the life cycle to adapt best to the situation of the company, then it will be discussed among managers and peers and also will be documented. All the outlines for the software development process based on the compatible software life cycle and project standard will be documented.

* 1. Guidelines and criteria for the projects' tailoring of the organization's standard software process are developed and maintained

As said inactivity C, the life cycle will be changed to accommodate the need for project and company. Teri will talk to his peers if they are having difficulty in reading the current standard software process if so the process will be divided into subprocess so the resulting software process description can be more understandable.

* 1. The organization's software process database is established and maintained.

[Activity d of Organization Process Focus]

Britney will make all the databases that will be required for the software processes, development, and during the software overall life.

* 1. A library of software process-related documentation is established and maintained.

All the documents were written by Teri and others helping him coauthor, and the documents will be categorized for high readability and searchability when needed. The new process’s project standard, procedure, development plans, life cycle, QA and testing standard documents will be categorized into different groups and will be made a library of it.

1. **Training Program:**
   1. Each software project develops and maintains a training plan that specifies its training needs.

The plan suggested by the author of assignment 8 will be used. “Stan will meet with each member of the group at least once a month and determine if there are any skills deficiencies. From this, he will update the project training plan to meet company and team needs. This plan will consist of a prioritized set of training objectives, a draft as to how the training will be accomplished, and a draft of the timetable when the training will be completed. Based on this plan, training will be periodically conducted by members of the team or by external entities. When training is completed to a given satisfactory level of quality, the corresponding item will be removed from the training plan.” [2]

* 1. The organization's training plan is developed and revised according to a documented procedure.

Stan will periodically visit the owner, and project manager to see if any changes in training plan need to be done. Stan will interview engineers as well as managers to get the most useful changes that need to be added in training plan for benefiting current project and the one which the company needs.

* 1. The training for the organization is performed in accordance with the organization's training plan.

The training plan created in activity 1 will be implemented. Stan will assign who will need what kind of training and who will be providing it. Stan will describe how the funding will be covered for the training program. It will also specify is the training is needed before the project starts or can be done simultaneously. It will be assumed that if the workers take that training for one time than he is eligible to perform that task.

* 1. Training courses prepared at the organization level are developed and maintained according to organization standards.

Most of the training except the procedure of software development, the life cycle will be trained outside the organization. There are not many people in the company to assign someone to do it specifically. There will be tuition reimbursement service for anyone who takes the certification classes to get that training needed for company standards.

* 1. A waiver procedure for required training is established and used to determine whether individuals already possess the knowledge and skills required to perform in their designated roles.

Any engineers who already know, the task which will be taught in training or the training required to perform in his new role, can waive his training requirement. This can be done by visiting the project manager and explain the skills you have if project managers do not know about it. If the Project manager knows about it, he can waive some training requirements created by stan for that person.

* 1. Records of training are maintained.

If any engineers get any kind of training then it will be recorded. So, later he can be assigned if some task appears related to the training he got.

1. **Integrated Software Management:**
   1. The project's defined software process is developed by tailoring the organization's standard software process according to a documented procedure.

[Activity 2,3 of OPD]

The software process will be drafted according to the opinion of developers which should satisfy the organization requirement. The changes in the software process life cycle can be done to accommodate the need of team and company if needed.

* 1. Each project's defined software process is revised according to a documented procedure.

When the changes in the software process life cycle have to be done, it needs to be discussed with managers and senior engineers. The changes are also needed to be documented.

* 1. The project's software development plan, which describes the use of the project's defined software process, is developed and revised according to a documented procedure.

When the process is changed so do the use of process and work done in different life cycle needs to be changed.

* 1. The software project is managed in accordance with the project's defined software process.

All the software developed after this activity will have to follow the specified standard software process. Gathering data, analyzing, and reporting will be done according to documentation for every project.

* 1. The organization's software process database is used for software planning and estimating.

[Activity 5/e of OPD]

[Activity 4/d of OPF]

* 1. The size of the software work products (or size of changes to the software work products) is managed according to a documented procedure

The manager will predict the size of the software according to the documents documented in organizational software process database. And the standard process will be used to get the prediction from those data.

* 1. The project's software effort and costs are managed according to a documented procedure.

The cost and effort are estimated by the manager by looking in the process database and following the standard process.

* 1. The project's critical computer resources are managed according to a documented procedure

Everybody has the same resources.

* 1. The critical dependencies and critical paths of the project's software schedule are managed according to a documented procedure.

The manager will look all the complexity that is derived from above. He will also come up with the total duration the project is supposed to be finished and make different checkpoints to finish project on time.

* 1. The project's software risks are identified, assessed, documented, and managed according to a documented procedure.

The manager will analyze all the risks that are involved and can arise. The possible steps will be documented that can be taken to solve the project.

* 1. Reviews of the software project are periodically performed to determine the actions needed to bring the software project's performance and result in line with the current and projected needs of the business, customer, and end-users, as appropriate.

The manager will decide if the schedule or role of some engineers need to be changed. If there is two project happening simultaneously then necessary changes will be done to accommodate it. The customer needs will be listed and will do necessary changes accordingly.

1. **Software Product Engineering**
   1. Appropriate software engineering methods and tools are integrated into the project's defined software process.

[Activity 1,2 of ISM]

* 1. The software requirements are developed, maintained, documented, and verified by systematically analyzing the allocated requirements according to the project's defined software process.

All the developers will be doing their joint effort in making software documentation while designer and Teri will be focusing on requirement writing. The requirements must be verified by managers and senior engineers before it is taken to customer for verification.

* 1. The software design is developed, maintained, documented, and verified, according to the project's defined software process, to accommodate the software requirements and to form the framework for coding.

Abe and Ursula will design the software based on the requirement written before. The designing of the software will be done in early phase of the development and the necessary changes will be done later in development phase.

* 1. The software code is developed, maintained, documented, and verified, according to the project's defined software process, to implement the software requirements and software design.

All the developers will be involved in coding to develop the software according to the software architecture and to fulfill the requirement of the customer.

* 1. Software testing is performed according to the project's defined software process.

Frank, Grace, Holy, Ingrid will create a different test case to make sure the software is working correctly, and it is fulfilling the requirement. As the project goes on new tests will be made.

* 1. Integration testing of the software is planned and performed according to the project's defined software process.

Britney and Claire will be responsible for making test cases of integration testing. The software will be integrated stage by stage in agile manner to make the final software that will fulfill the requirement.

* 1. System and acceptance testing of the software are planned and performed to demonstrate that the software satisfies its requirements.

Teri will compare each of the features developed with the requirement written to make sure than it is up to the customer demand.

* 1. The documentation that will be used to operate and maintain the software is developed and maintained according to the project's defined software process.

The manual for the software will be written by Teri. He will work with the engineers who designed the feature and will document all that so it can be used later by the customer.

* 1. Data on defects identified in peer reviews and testing are collected and analyzed according to the project's defined software process.

The defect description of the software, defect unit testing, miswritten requirement will be analyzed. Keith and Larry will use the software as end-users to find if anything is not working as it should.

* 1. Consistency is maintained across software work products, including the software plans, process descriptions, allocated requirements, software requirements, software design, code, test plans, and test procedures.

The software will be developed as it is documented. If any technical difficulty occurs and the product cannot be made according to description then the decryption will be changed to make everything consistent.

1. **Intergroup Coordination**
   1. The software engineering group and the other engineering groups participate with the customer and end-users, as appropriate, to establish the system requirements.

The group of engineers(Keith, Larry, and Xavier) will do sample surveys in the public to get some data and the perspective of end-users.

* 1. Representatives of the project's software engineering group work with representatives of the other engineering groups to monitor and coordinate technical activities and resolve technical issues.

Pretty much all members are working as one team in our company, so the software engineer and system engineer will be working together in AX system.

* 1. A documented plan is used to communicate intergroup commitments and to coordinate and track the work performed.

The Xavier will have the scrum type role and will make all the increments to reflect the number of features developed and work done. Xavier will work with manager to set up next milestone and the necessary sprint backlog.

* 1. Critical dependencies between engineering groups are identified, negotiated, and tracked according to a documented procedure.

Working as one group.

* 1. Work products produced as input to other engineering groups are reviewed by representatives of the receiving groups to ensure that the work products meet their needs.

Working as one group.

* 1. Intergroup issues not resolvable by the individual representatives of the project engineering groups are handled according to a documented procedure.

Working as one group.

* 1. Representatives of the project engineering groups conduct periodic technical reviews and interchanges.

Project engineer and Senior software engineer's roles are overlapped. It is usually a meeting to make sure that developers are making a product as thought by product engineers. But our roles are overlapped the meetings will not be needed. Senior engineer Abe will just report to Project Manager/Owner.

1. Peer reviews:
   1. Peer reviews are planned, and the plans are documented.

All engineers will be involved in peer review. The tester will review the work of tester, as well as developer and designer, will also review their peers' work. The manager will decide the date for peer review according to the progress of the project.

* 1. Peer reviews are performed according to a documented procedure.

One of the members from team will be trained as peer review expert. He will develop all the checklist that needs to be checked for the review to be passed. There will be conditions like working of code, manageability, correctness level, bugs level, compliance with the standard and procedures. These checklists will be documented.

* 1. Data on the conduct and results of the peer reviews are recorded.

All the events, discussions, and correctness made after peer review will be documented. Ursula will record the size of product or feature reviewed, size of review team, level of expertise, length of peer review, number and types of defect found, and the time it took to fix those errors.

Resources:

[1] . M. Paulk et al., "Key Practices of the Capability Mature ModelSM, Version 1.1,"*Technical Report CMU/SEI-93-TR-025*, Feb. 1993.  
[Online] Available: [http://dx.doi.org.byui.idm.oclc.org/10.1109/52.219617](https://content.byui.edu/file/fb36352f-44a4-473d-bb81-1e5a2ce36646/1/08%20-%20Paulk%20-%20Key%20Practices%20of%20the%20CMM.pdf)

[2]. *08 Ponder : CMM Level 3*. [Online]. Available: https://content.byui.edu/file/a2001083-4378-4d58-a641-903d8b5bbaa6/1/Ponder/432.08.Ponder.html. [Accessed: 10-Nov-2019].

Grading:

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| --- | --- | --- | --- | --- | --- |
|  | Exceptional 100% | Good 90% | Acceptable 70% | Developing 50% | Missing 0% |
| Process Areas & Activities 30% | It is abundantly clear that every activity is understood. | Every activity is related to the problem in some capacity. | Every activity in every process area is listed and something is said about it in the plan. | Not all the activities are mentioned or one large misunderstanding exists | Large parts of the process areas are not described or inaccurately described. |
| Plan 50% | It is obvious that real thought went into the application of the plan. | All seven process areas are applied to the scenario in an uncontrived way. | One aspect of the scenario is not addressed in the process area or one aspect of the process area is not applied to the scenario. | Large parts of the plan are overly vague, do not appear to be related to the scenario, or do not appear to be related to the process area. | No attempt was made to apply the process areas to the scenario. |
| Professionalism 20% | The paper is easy to read and ideas are clearly communicated. | Everything is properly cited, there are no grammar or spelling errors, and the writing style is "professional." | One instance of a spelling error, grammar error, incomplete citation, overly verbose, poor formatting, or poor writing. | A citation is missing where one is needed (plagiarism alert!). | Gross spelling/grammar errors or other aspects of the writing that make the paper difficult to read. |