Software Engineering

Unit 3 - Assignment

TEAM- X4B

By-

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Question 1

1. 1) Assess the quality of your project by maintaining a sprint burndown, calculating the team velocity metric, throughput and cycle time.
    a. While working on your project, the go to approach to debug is using print statements. Could you include these statements to highlight the location and values at the current point in the project?
    b. Could you build two valid and invalid test cases for any two functions in your project?

a)

- Yes, In our project it is initially debugged by using `echo` statements which is the default print statement in php.
- After some time our team members were finding it tough to debug a lot of values , so we switched to `Xdebug` and `VSCode`
- Switching over to these two debuggers gave us more clarity on the project and the expected deliverables

b)

- Our test cases were aimed at real world problems or edge cases. We divided into groups and thought of all test cases that were possible , one group doing valid test cases and the other group invalid test cases.
- The invalid test cases were
    - Database was not given permission (file access testcase)
    - Assigning NULL Values to see if SQL was working correctly
- The valid test cases were
    - Populating the database with user filled data and check their data type and constraints
    - Check the user access in the login screen

Question 2

Let's assume you have received funding to launch your project as a start-up. Being at the nascent stage of development processes, you have been tagged under the "Initial" maturity level. Your task is to brainstorm and come up with at least 2-3 new functionality or ways to improve the quality of your project and attain higher levels of maturity according to the CMM model.

At the initial level, processes are disorganized, even chaotic. Success is likely to depend on individual efforts, and is not considered to be repeatable, because processes would not be sufficiently defined and documented to allow them to be replicated. The organization at this level is characterized by AD HOC activities (organization is not planned in advance).

At the Repeatable Level(Level 2), policies for managing a software project and procedures to implement those policies are established. Planning and managing new projects is based on experience with similar projects. An objective in reaching Level-2 is to institutionalize effective management processes for software projects, which allow the organization to repeat successful practices developed in earlier projects, although the specific processes implemented by the projects may differ. An effective process can be characterized as practiced, documented, enforced, trained, measured, and able to improve.

We have installed basic software management controls. Realistic project commitments are based on the results observed on previous projects and on the requirements of the

current project. The software managers for a project track software costs, schedules, and functionality; problems in meeting commitments are identified when they arise. Software requirements and the work products developed to satisfy them are baselined, and their integrity is controlled. Software project standards are defined, and the organization ensures that they are faithfully followed. The software project works with its subcontractors, if any, to establish a strong customer supplier relationship.

The planning and tracking of the software project is stable and earlier success can be repeated. The project's process is under the effective control of a project management system, following realistic plans based on the performance of previous projects.

project management tasks to be dealt with in a properly sequential form where the next task is only performed and performed well when the previous task has been completed.
Gant charts are also used to clearly display a visual representation of all of the phases that the tasks go through and all of the dependencies involved in the project.
The Agile frameworks commonly include different techniques such as Scrum, Kanban, FDD, and DSDM, etc. The Classical technique, and Waterfall technique are used for specific processes.

At the defined level, the organization has standardized on a software process, which is properly documented. A software process group exists in the organization that owns & manages the process. In the process, each step is carefully defined with verifiable entry & exit criteria, methods for performing the step, & verification mechanism for the output of the step. The softwares that is undergoing development

meets the ISO 9001 standards which deals with the right methods of development, production, services and maintenance of the product.

The organization supports various methods of software verification ranging from informal methods like peer review to the most formal methods like walkthroughs and inspections.
The activities that are involved in peer review methods may include SRS document verification, SDD verification, and program verification. In this method, the reviewers may also prepare a short report on their observations or findings, etc.

Walk-throughs are the formal and very systematic type of verification method as compared to peer-review. In a walkthrough, the author of the software document presents the document to other persons which can range from 2 to 7. Participants are not expected to prepare anything. The presenter is responsible for preparing the meeting. The document(s) is/are distributed to all participants. At the time of the meeting of the walk-through, the author introduces the content in order to make them familiar with it and all the participants are free to ask their doubts.

Inspections are the most structured and most formal type of verification method and are commonly known as inspections. A team of three to six participants is constituted which is led by an impartial moderator. Every person in the group participates openly, actively, and follows the rules about how such a review is to be conducted. Everyone may get time to express their views, potential faults, and critical areas. After the meeting, a final report is prepared after incorporating necessary suggestions by the moderator.

At the managed level, quantitative goals exist for process & products Data is collected from software processes, which is used to build models to characterize the process. Due to the models, the organization has a good insight in the process. The results of using such a process can be predicted in quantitative terms.

Each year, we produce a vast amount of raw data. It comes from various sources like Financials, Sales, Marketing, Customers, and in-house operations and customer reviews. This raw data contains much valuable information that could increase a company's overall performance. Data Analytics tools collect data, process it into a significant resource, and deliver solutions based on our queries.

1. R and Python
2. Microsoft Excel
3. Tableau
4. RapidMiner
5. KNIME
6. Power BI
7. Apache Spark
8. QlikView
9. Zoho Analytics

At the optimization level, the focus is on continuous improvement. Data is collected & routinely analyzed to identify areas that can be strengthened to improve quality or productivity. New technologies & tools are introduced & their effects are measured to improve the performance of the process. Best software engineering & management practices are used throughout the organization. This is the crucial level in our cmm model.

Feedback management software automates the collection and management of feedback from customers or stakeholders and helps incorporate the feedback directly into daily business operations. With feedback management software, you can turn customer feedback into actionable information and respond to any negative feedback in real time. Some products assign scores for customer satisfaction and allow you to compare your scores with that of your competitors.

Products in this category usually collect feedback from multiple touch points using surveys, web forms, and social media channels but consolidate all the feedback into a single dashboard. Advanced enterprise feedback management (EFM) tools not only allow you to manage feedback centrally but help distribute the information throughout the organization. You can allow multiple users to use the same EFM software, but assign role-based permissions to different users.
Feedback management software helps organizations save time and money on collecting and organizing feedback and provides them an opportunity to improve their products and services based on continuous feedback received from customers or employees.

Some of the feedback management softwares used by our startup in various processes:

- SurveyLegend
- Userwell
- Birdeye
- Medallia