ID: 201801015

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1. Requirement Analysis Phase

Requirements are the foundation for software development. Requirement Analysis is necessary to determine the basic approach of the project. By analyzing the market and customer requirements with market surveys and sales experts we can identify the risks and plans associated with the development of the project. The analysis will also identify and consider the risks that are associated with the requirements. The current system is analysed to learn the strengths and the weaknesses and improve upon them in later stages. The results of the analysis provide scope, project timeline and aid in predicting potential issues and drawbacks. Studies for product feasibility are carried out in this stage.

A few tools are:

Calibre: It aids in gathering requirements for storyboards and simulations. It provides visual features for modelling requirements and is compatible with testing roles, processes, and requirements.
ReqSuite: This tool is not too complex with extremely helpful tutorials. It is highly customizable and can easily set up use cases along with reusable requirements.
Mind Manager: It creates a central dashboard with all the necessary requirements and information which makes it easier to visualise and also supports coediting which makes it easier to collaborate and work in real-time.

2. Planning Phase

With the requirements defined in the first stage of the software development cycle, we move on to the planning phase. In the planning phase, the project timeline is decided. A specific approach is created which implements the software successfully with minimum risks and costs. This stage involves identifying and prioritizing the scope of the project and define a detailed action plan for the same. The varied resources and tasks are assigned to different processes to build the structure of the project.
The project's teams and leadership structure is defined, it also includes feedback from stakeholders. This step plots a clear path for the team to successful completion of the project and sets boundaries to avoid the project shifting or expanding from its original purpose.

A few tools are:

Nifty: It's an app that helps with project management and team collaboration. It helps in maintaining efficiency along with project milestones. Its user-friendly design allows multiple planning approaches.

MindMeister: This tool is extremely helpful in planning as it integrates a feature that allows one to make mind maps and directly export tasks from the mind maps onto the task boards.

Trello: It is a collaborative tool that helps in organizing projects into boards. It allows creating granular tasks, checklists, task trackers, lists and many other features which help in effective project planning

3. Architectural Design Phase

This is one of the critical stages after requirements and planning as the main structural components of the system and the different relationships between them are identified here. The architecture of a system includes its major components and how they interact with each other. The main aim for this phase is to transform all the requirements into detailed specifications which cover all the aspects of the software. In this phase, Documents such as SRS are used to create system and software design. It helps in defining the overall system specifications. Depending on the requirements, multiple designs are created, it includes flowcharts, UML schemas, sketches or prototypes.

A few tools are:

LucidChart: This tool comes with a wide range of templates to create diagrams and flow charts. It allows real-time collaboration and is easy to use.
Adobe XD: It is a web-based graphic designing tool. It is used for graphic editing and creating interactive user interfaces. It provides multiple features which aid in creating wireframes, app interfaces and prototyping.
Enterprise Architect: This tool acts as a platform for the visualization design and modelling based on UML. It provides features that are specific to the development process.

4. Software Development Phase

This is a phase in which the actual coding starts and the program for which requirement analysis, planning and designing were done is implemented by writing code. Coding involves following various standards and use development environment tools like compilers and debuggers to implement and execute the code. Writing code becomes much easier if the previous stages were performed properly and in an organised manner and the only job is to convert the designs into the source code. Various languages and libraries and tech stacks are used which align with the product being developed.

A few tools used are:

Github: It is a web-based Git repository hosting service for collaborative development and version control
Docker: Docker is an open platform for developers and can be used to build, ship, and run distributed applications. It provides a containerisation platform that enables us to package our software in a file system that can communicate with each other.
Sublime Text: Sublime Text is an advanced text editor for code and markup. It has a variety of shortcuts that enable developers to code easily. It also lets us change many lines simultaneously.

5. Testing Phase

Once the code has been written, we move on to testing the code in accordance with the requirements that we had gathered. This needs to be done to ensure that the code is addressing all the requirements and is working on edge or boundary cases as well as errors are being handled. Any bugs that we find during this phase are fixed after a thorough examination. The software needs to align with the customer

requirements and thus accordingly various testing techniques are applied such as unit testing, integration testing, black-box testing, white-box testing, system testing, acceptance testing. The changes are pinged back to the developers and the testing continues till the software meets all the requirements.

A few tools are:

Selenium: It is a testing framework to perform web application testing across various platforms and browsers. Selenium helps the testers to write tests in various programming languages and It also offers a record and playback feature to write tests without having to learn the Selenium IDE.

ZephyrScale: It is a scalable, performant test management solution inside Jira with Advanced test planning, reporting and reusability test features.

6. Deployment Phase

After careful testing, it is time to deploy the software so that it can be accessed and used by the clients. Deployment can be done in versions like alpha, beta and then various updates and even to a limited group of people first before the actual market release. This is done to get feedback and make final changes. After the market release, the deployed software needs to be maintained. once the software is certified, and no bugs or errors are stated, then it is deployed.

A few tools are:

Google Cloud Deployment Manager: This tool helps in managing and creating cloud resources with simple templates. It also allows us to do repeatable deployments by creating configuration files for defining the resources.

AWS Code Deploy: This is a service from Amazon Web Services that automates code deployments to any instance. It works on any platform, language and application.

GitHub Actions: GitHub Actions allows developers to create workflows that can be triggered by specific events when they occur. These workflows can be used to trigger a series of steps that can perform various tasks like deployment.

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