**Assignment-4**

**Software Development Life Cycle and Software Testing Life Cycle**

1. Explain the various phases of SDLC ?

**1)Requirement gathering and analysis:**  Business requirements are gathered in this phase. This phase is the main focus of the project managers and stake holders. Meetings with managers, stake holders and users are held in order to determine the requirements like;  Who is going to use the system? How will they use the system?  What data should be input into the system?  What data should be output by the system?  These are general questions that get answered during a requirements gathering phase.

**2) Design:**  In this phase the system and software design is prepared from the requirement specifications which were studied in the first phase. The system design specifications serve as input for the next phase of the model.

**3) Implementation / Coding:**  On receiving system design documents, the work is divided in modules/units and actual coding is started. Since, in this phase the code is produced so it is the main focus for the developer. This is the longest phase of the software development life cycle.

**4) Testing :**  After the code is developed it is tested against the requirements to make sure that the product is actually solving the needs addressed and gathered during the requirements phase. During this phase all types of functional testing like unit testing, integration testing, system testing, acceptance testing are done as well as non functional testing are also done.

**5) Deployment:** After successful testing the product is delivered / deployed to the customer for their use. As soon as the product is given to the customers they will first do the beta testing. If any changes are required or if any bugs are caught, then they will report it to the engineering team. Once those changes are made or the bugs are fixed then the final deployment will happen

**6) Maintenance:** Once when the customers starts using the developed system then the actual problems comes up and needs to be solved from time to time. This process where the care is taken for the developed product is known as maintenance phase.

1. Explain the various phases of STLC ?

Every company follows its own Software Testing Life Cycle. STLC is affected by the Software Development Life Cycle (SDLC) implemented by the company as well as the management’s views towards Quality Assurance & Control activities. The different stages/phases of STLC are.

**1.    Requirement Analysis/Review**

         This is a very important phase in STLC. Here the focus is on understanding the requirements of the system with the viewpoint of testing in mind.

         In this phase the QA interacts with the Business Analyst, System Analyst, Development Manager/Team Lead, etc. or if required the QA may also interact with Client to completely understand the requirements of the system.

         During this phase the QA takes many important decisions like what are the testing types & techniques to be performed, feasibility for automation testing implementation, etc.

**2.    Test Planning**

         In this phase the QA/QA Lead/QA Manager plans for the complete testing process. Important documents like Test Strategy, Test Plan and Effort Estimation are derived from this phase.

         Everything regarding testing like selection of the testing tools, test efforts estimations, planning resources, determining roles and responsibilities of the personnel involved in the process, planning for the training required, etc. are decided in this phase.

         This phase is very important as any small mistake in this phase can result in major issues in the project regarding time, money, efforts, etc.

**3.    Test Designing**

         Creation, Review & Update of Test Cases as well as Test Scripts are done in this phase. The test cases prepared by the QA team are reviewed and approved.

         Test data may also be created in this phase by the QA team if test environment is available to them.

**4.    Test Environment Setup**

         Test Environment is the actual system/environment/setup where the testing team will be testing the application. Test environment is prepared by understanding the required system architecture, software & hardware requirements, etc.

         Many times it happens that testing team is not involved in setting up the test environment. In such scenarios, it is preferable that the testing team should implement Smoke Testing to verify the readiness of the test environment before starting the actual testing.

**5.    Test Execution**

         The test cases which were prepared earlier are executed in this phase. In this phase, the testers test the websites. Different testing techniques as well as methods are implemented and executed on the software/application to break the system and find bugs.

         Bugs are reported to the development team. The development team resolves the bugs and the system is retested to ensure that it is bug free and ready to go live.

**6.    Test Closure**

         When the testing team is confident that all the reported bugs are resolved and the system is ready according to the client’s requirements, the software testing life cycle enters the last stage ie. Test Closure stage.

         In this stage, evaluation is done for the complete testing cycle, test closure reports are prepared, proper analysis and documentation is done for the major or critical bugs so that such situations can be handled efficiently and effectively in future projects, etc

3.Explain Traditional Software Development Model ?

The Waterfall Model was first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases.

Waterfall model is the earliest SDLC approach that was used for software.

**Different Phases of Water-Fall Models**

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| --- | --- |
| **Requirement Gathering stage** | * During this phase, detailed requirements of the software system to be developed are gathered from client |
| **Design Stage** | * Plan the programming language like java , Php , .net * Or database like Oracle, My SQL, etc. * Or other high-level technical details of the project |
| **Built Stage** | * After design stage, it is built stage, that is nothing but coding the software |
| **Test Stage** | * In this phase, you test the software to verify that it is built as per the specifications given by the client. |
| **Deployment stage** | * Deploy the application in the respective environment. |
| **Maintenance stage** | * Once your system is ready to use, you may later require change the code as per customer request. |

### ****When to use SDLC Waterfall Model****

* Requirements are not changing frequently
* Application is not complicated and big
* Project is short
* Requirement is clear
* Environment is stable
* Technology and tools used are not dynamic and is stable
* Resources are available and trained

### ****Advantages and Disadvantages of Waterfall-Model****

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| --- | --- | --- | --- |
| **Advantages**   1. Before the next phase of development, each phase must be completed.  |  |  | | --- | --- | | 1. Suited for smaller projects where requirements are well defined 2. They should perform quality assurance test (Verification and Validation) before completing each stage 3. Elaborate documentation is done at every phase of the software's development cycle 4. Project is completely dependent on project team with minimum client intervention 5. Any changes in software is made during the process of the development |  | | **Disadvantages**   1. Error can be fixed only during the phases 2. It is not desirable for complex project where requirement changes frequently 3. Testing period comes quite late in the developmental process 4. Documentation occupies a lot of time of developers and testers 5. Clients valuable feedback cannot be included with ongoing development phase 6. Small changes or errors that arise in the completed software may cause a lot of problems |

4.Explain Prototype Software development Model?

1. Explain Iterative Enhancement life Cycle Model
2. Explain the various types of Maintenance Phase.
3. What is the deference between High Level design and Low Level design?
4. Explain V-Shaped Model.
5. What is the difference between functional spec. and Business requirement specification ?
6. What is the difference between Testing and debugging?