Software Development Processes: The Basics

There are several different software development models that can be employed depending on the project to be completed. Each process determines what steps the software development life cycle takes. Every step in the life cycle ends with an end-product to be used in the next step.

Layout design for the product is derived from requirements. This determines the codes to be written and is called the Development Phase. The Testing Phase confirms the resulting product from the development stage and checks to see if it meets all the requirements.

The basic steps that define the process of software development are:

» Requirements Development and Analysis

» Product Design

» Software Coding

» Software Testing

» Product Deployment

» Product Maintenance

1. REQUIREMENTS DEVELOPMENT AND ANALYSIS

During this step, requirements for product creation are gathered. The questions of what type of data goes into and out of the product, who gets the product, and how the product is utilized are all answered during this stage.

After accomplishing this, analysis of the conditions will occur. All elements destined for the final product are looked at in detail to determine its plausibility. A requirement specification document is then created. Upon completion of the requirements analysis, the development team will then proceed to the next level of creating a product design to be followed throughout the development process.

2. PRODUCT DESIGN

During this step, the creation of the product design from the requirements documentation ensues.

Product design assists in the specification of the necessary hardware required to run the product; in other words, the deployment. It also helps in clearly marking out the general product architecture, depicting the software modules required to be developed and their relationships.

It is also time to make a choice of development platform, e.g., .NET, Java, Laravel, Ruby on Rails or FileMaker. This choice depends on the requirements themselves but also on which platform is commonly used within the company.

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Furthermore, the User Interface and User Experience are designed in this step. Considering the target users of the software application and the main features, a user-friendly and modern looking User Interface is designed.

The product design layouts further serve as a base for the next step in the development cycle. In this next step, which involves coding, the development team comes up with a plan for implementing the programming language.

3. SOFTWARE CODING

After the phase of product design, the development team moves on to the stage of Coding and Implementation. Once the development team has the requirement specification and the design documents in hand, the software developers can start programming. Besides coding, the developers also perform unit (aka module) testing in this phase, to detect potential problems as early as possible in the development phase.

Some companies prefer to outsource the coding activities (and often the previous step of Product Design) to a third-party software development company. Reasons for this outsourcing vary from simply not having the required resources or skills available, to preferring to focus with their own team on the company's core products and services.

4. SOFTWARE TESTING

After the step of coding and implementation, the team can then proceed to Integration and Validation Testing. Software development service teams are in a constant process of releasing different software applications for various purposes; this process is necessary as it is important to vigorously test the product against all parameters available. This phase exposes potential bugs in the product, and if any are found, they are corrected.

As we saw in the previous step, the software developers themselves will perform unit (module) testing. The next stage is Integration Testing. Here the interaction between the individual modules and/or external systems are tested. Then Validation Testing is performed, on the software end product, based on the requirements and UI/UX design, from an end-user point of view.

A different approach to test is the so-called Test-Driven Development (TDD) method. Using this method, software developers would first write a test script for requirements, and only after that, write the code to fulfill those require-ments. The test is then run, and the code is adjusted until the test passes.

If the software application contains no more (non-acceptable) problems, the application is deployed.

5. PRODUCT DEPLOYMENT

Once the software product passes the testing phase, deployment of the product can ensue. Once the product is ready, the first batch is rolled out and opened to the public. That is known as Beta Testing. If any changes are required due to customer feedback, or any bugs not seen during the testing phase arise, they can be corrected and implemented during this phase of software development.

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Deployment normally involves setting up a so-called "Production" server on which the software will run. Such a server can be one of the company's own servers, or it can be in the "cloud" by using, for example, Amazon Web Services or Microsoft Azure.

6. PRODUCT MAINTENANCE

Once all above steps have successfully passed, and the software product is fully released into the market, the product must be kept operational with regular maintenance. This involves fixing issues that arise, and keeping the systems up to date with the latest operating system patches (updates) of used third-party software. In case the user base of the software product increases significantly, expansion in the form of additional processing power, memory and/or database capacity might need to be done to keep the system running smoothly.

These are the basic steps of software development. As is probably understood, the steps used will vary at each company, to accommodate for the environment and specific situations for each software development project.

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