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Overview of Web Development Life cycle in Software Engineering

Ashim Sarkar
Senior Faculty, NIIT, Ranchi Jharkhand India

Abstract

Software development can be achieved with the help of the structure and systematic development model. It is a sequential process which starts with the requirement collection and completes with the project implementation and maintenance at client end. Software functionality can be modified by using prototyping model of software development. This article is an attempt to develop a life cycle model for the web based application on the basis of Software Development Life Cycle Model (SDLC). The First section of this article describes the functionalities and various steps in Web Development Life Cycle Model. The next section describes the steps to be followed during the web development life cycle. The last section describes the benefits of the WDLC.

Keywords: WDLC, SDLC, web application.

I. Introduction

There are different types of web application, which are present on the cloud for certain purposes and use. Each one of them has different designs such as.

- Web design for educational purpose.
- Web design for personal purpose.
- Web design for commercial purpose.
- Web design for an Organization.
- Web design for news and events.
- Web design for entertainment.
- Web design for blogging.

As websites are designed for different purpose, there are different web browsers are available, which can be used by the client for various functionalities, look and feel. Internet Explorer, Mozilla, Firefox, Netscape, Opera are some of the web browsers, which are used, but most popularly used web browser is Mozilla and Internet Explorer.

II. Literature Survey

In past many researchers worked on different aspect of SDLC.Generally they compare SDLC models and identify the best model for a particular situation.Vishwas Massey and K.J.Satao in their article [1] have also compared various development models for analysis and performance and have also proposed a new model for better performance. A related article by the U.S. Department of Justice described how the primary goal of any SDLC is to deliver quality software systems (DOJ, 2000). [2][3] It further defined a quality system as one that:

- Existence of all customer expectation.
- Well working of the software in planned resource.
- Easy and low cost of maintenance.

SDLC is a combination of different phases, each phase comprised of multiple steps. These steps typically include software feasibility, analysis, design, coding, testing and maintenance. Osborn (1995) also discussed traditional SDLC techniques and how over time, the phases of these

approaches have become preserved in a development cycle that includes:

- Feasibility analysis.
- Defining requirements.
- Designing a system to meet those requirements.
- Coding or construction.
- Testing and Maintenance.

Each phase of the development cycle is strictly follows in a sequence. For example, in the waterfall model, the output of all prior effort is a prerequisite for subsequent steps (e.g. all details of requirements definitions are documented before the start of design, design is complete before coding, and testing is performed prior to release.

III. Methodology

This article is following a research-based descriptive study to compare the SDLC model to prepare a web based analysis and design model. It follows the basic steps of SDLC to prepare the complete web based project development. This article is an effort to make a WDLC model, which can be adopted for any kind of web based application development.

IV. Web Based Application Development

While planning to publish the website the initial phase towards website publication starts with planning and completes with development. The website development encompasses various complex decision-making processes. Like the Software Development Life Cycle, We do have Web Development Life Cycle. The websites vary from educational to commercial and many more. Even though it functionally differs, they all follow the basic designing pattern to ensure consistency and completeness. WDLC is an organizational process of developing and maintaining Website. There are five phases of the WDLC which enables the complete designing process. Each of the phases includes a set of tasks, which rely on techniques that produce specific document files for the understanding of the project. [3].

Proposed Phases of WDLC

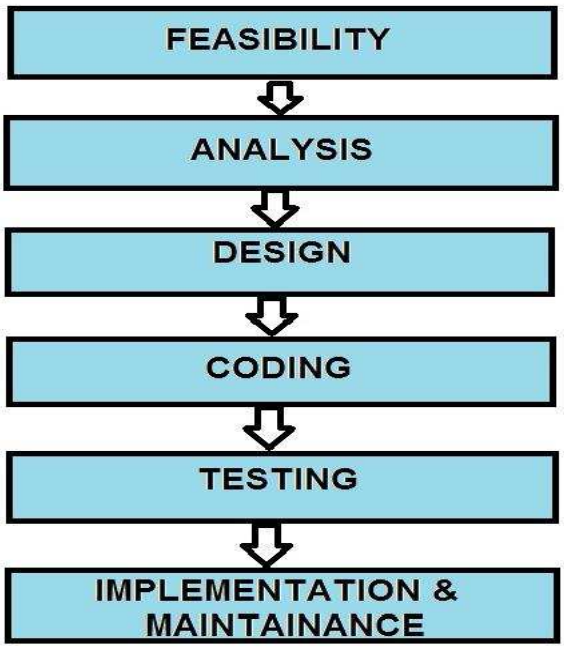

Fig 1. Proposed model of WDLC Phases

IV. A) Website feasibility

The very first phase of the WDLC is the planning. The feasibility which is very important as it is the building block for the entire website. If the planning goes wrong, then the next phases of the WDLC will also go in the wrong way. Making the good decisions about the website's organization and the page design begins with creating a plan. Following is the steps which have to be carried out in the planning phase of WDLC.

- **Website's objectives**

Each website has some or the other purpose for which it has been designed. Most likely gaining profit, brand, sales are some of the goals of the website but with this, other goals are also there. The proper

identification of the goals and objectives of the website lead to the correct plan.

- **End users profile**

After the determination of the business objectives for the site, the next critical steps identify the site's target audiences, determine why these audiences might want to visit the site and identify any technological constraints they might experience when viewing the site.

- **Web technologies (ASP, JSP, PHP, SERVLET) you will use**

The technological constraints are important to achieve the user's satisfaction. The versions of the web browser, high-speed broadband Internet connections, highest monitor resolution, etc. are the technical constraints. It would be wiser instead to plan and design for visitors who might be working under the most common technological constraints. [4].

- **Owners and authors of the website**

After planning the goals and objectives, understanding the audiences and technologies to be used, one has to focus on the owners and authors which are building the website. Their participation in each phase of WDLC is very important.

- **Type of content display on the Website**

The planning phase also tells us which information will be put on the website and where it has to be put. The contents of the website are important for the success of the website as good contents increases the quality of the website. [5].

IV. B) Website Analysis

It is a set of activity in which the analyst gathers the information requirements of the users, analyses them systematically in the form of functionality of the application system, the input data requirement and their sources, the output data and their presentation requirements. The system analyst gathers data about the performance expectations of the users such as expected response time the total turn-around time, etc. There are following steps which are carried out in analysis phase of WDLC

- **Identify the functionalities based on requirement**

In this phase, the user requirements are considered, and accordingly, the functions are identified. With the help of gathered data, the different tasks are defined to get the proper output.

- **Task to complete all functionalities**

After identifying all the tasks, one has to focus on all the tasks that are the basis for the development of the website. The processes required to support website features are identification site map, determination of the structure of the website, finalizing the contents to be placed on the web page, etc. one of the more important phases in the WDLC-As analysis of any Process is very important to guarantee that the proposed system possesses all the required qualities and data for which users are looking for. If the analysis phase went wrong, then one cannot guarantee the quality and the output of the desired system and that's the reason the analysis is one of the important phases of the WDLC.

IV. C) Website design and Development

It involves preparing the detail design of the website. It prepares various diagrammatic representations of the logical and physical artifacts to be developed during the development stages to follow. The major artifacts include data models, process models and presentation model. Finally, the system design is documented. This involves programming and testing individual programs based on the design document. [6]

The developers are responsible for programming, and they also create text data sets for inputs and verify that the program generates the expected output for these input's data sets. The individual programs are also reviewed to ensure that they meet programming standard as expected by the users. This is the only phase where the conceptual website is first translated into a useful and attractive website. The purpose of the website design is also considered in this phase. For example

- Academic or carrier related information for the students.
- E-commerce website for business purpose.
- Information about a particular organization.
- Information sharing about your hobbies and knowledge.

The Website layout is one of the important decisions which are taken in this phase. It includes, Single column layout, Split screen layout, Asymmetrical layout, A grid of cards, Magazine layout, Boxes layout, Fixed sidebar layout, Featured image layout, F-shaped layout, F-shaped layout, One big photo layout. Among them magazine layout is the most complex layout any one of these layouts is considered while designing the website.

IV. D) Website Testing

Testing is the most important phase of the website, in this phase we compare the actual functionalities with expected functionalities. If there is no difference between expected and original functionalities then we consider the product as a quality product. It involves planning the testing, creating the text data, executing text runs, matching the text results with the expected results, analyzing the differences fixing the bugs and testing the bug fixing repeatedly until a satisfactory number of mismatches are removed. Websites should be tested at various stages of the WDLC for reviewing the Web pages, Content, Functionality, Usability, and Correctness. Usability of the website is the measure of how well the Web page allows a user to accomplish goals testing involves the following checks

- Style sheet validation
- Content validation
- Working of page links.
- Design Flexibility.
- Display size of windows.
- Speed of the website.
- Different font and colors.
- Website accessing via different media.
- Existence of all the functionalities.
- Look and feel of the website.
- Browser independence.
- Layout of the websites.
- Check for orphan pages.
- JavaScript enable or not.
- Check for page title and content.
- User friendly and easy to learn.
- Future add-on capability.
- Use of current technology.
- Check for language dependency.

IV. E) Website Implementation and maintenance

It involves publishing the website on the hosting system conducting preparation of server and database management system, parallel running and going live as core activities. In this stage website is first come in contact with the end users, and the users get a chance to work on it for the first time. Moreover, it involves the most important step of user acceptance testing, which marks the technical and commercial milestone of the WDLC. It involves maintaining the website always up to date to ensure that it is in the line with current information requirements considering even the latest changes in the same. It helps keep the website up to date thereby ensuring the user's high return on their investment at the operational level of the business. The developer analyses the changes in the light of the latest changes in the design identifies

the new changes in the design, verify quickly that it works as expected. Implementation phase involves the following activities.

- Website publishing.
- Responsibilities for updation of content.
- Authentication and authorization.
- Tracking of website.
- Use of log files to keep information about visitors.

There are some guidelines which are considered during these phases of the WDLC.

Guideline 1: The main objective for the website creation needs to be identified and validated to provide desired output.

Guideline 2: The physical appearance as well as the modularized structure of whole website should be prepared. This can be used as a blue print for further development.

Guideline 3: Requirement Gathering Include all customer needs along with their requirements parameters. As more specific the requirements are, more concise the development process would be.

Guideline 4: The collected requirements and the design parameters need to be verified against intellectual property law in order to avoid the privacy conflicts at the end of the website launch.

Guideline 5: Design Website must be unequable and free from ambiguity with simple good design where mass people can easily follow the content.

Guideline 6: Shortcuts provide navigational aids that help the readers move quickly through the site to get the necessary information they want.

Guideline 7: Unification once the structure is made, then the website can be compared against the similar functional sites to provide a unique application experience to the customer.

Guideline 8: Metalinguistic the additional features can be included to provide technical support to disabled customers with multilingual capabilities.

Guideline 9: Testing the created web application should be published after applying various levels of testing. The testing ensures that the final system is as per the objectives specified in the beginning.

Guideline 10: Maintenance Continuous updation is required to maintain the accuracy and quality of the website. This can also provide up-to date information to the customer.

V. Advantages

- This wdlc model can be adopted for simple and complex web applications.
- This model can be easily adopted for the web pages for information searching, retrieving updation and application downloads and for online marketing.
- This model is a sample approach which can be enhanced by including prototyping and spiral approach for advanced web applications.
- This model can also be used to develop the prototyping version and to prepare the test modules (test cases) which can be implemented on any web page designs.

VI. Conclusion

This WDLC model is a step-by-step web development life cycle model for the complete web-based application development. Even though the waterfall model are introduced the basic SDLC model provides a sequential structure for the software development. This WDLC provides a basic structure which also encompasses various guidelines to meet the requirements with the final product. This can be adopted by any type of web application development process like waterfall, prototyping, spiral, win-win

spiral. This can also be modified by including prototyping and iterative structure to improve the quality of the website.

VII. References

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