



An Agile Based Web Development Model for Cost Effective Website Design

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Abstract: Website development is a systematic process. It is differed from systematic software development activities. Traditional methods giving ways to develop software systems but those ways not fully suitable for website development. Traditional models like waterfall model, V model, iterative model, spiral model, etc cannot be used directly for the development of web systems mainly because the process and limits of websites are different than traditional process stages. This research paper focuses on an agile based website development method. It is supported concurrent and iterative development. This method was analyzed using Five projects. The analysis resulted that proposed method is more suitable for website development.

Keywords: Agile development model, Web development model, web design method.

1. INTRODUCTION

Software engineering deals with systematic, disciplined and quantifiable approach to the development, operation and maintenance of software. The process involved with the development of web Site is comparatively different from the process of developing conventional software. So we need to use different methods and methodologies for the development of web systems. Web engineering may be considered as the adaptation of conventional software engineering model. In conventional software development process we are using different software process models for software development. But these models cannot be used directly for the development of web sites since the content of web site changes frequently. So the conventional software engineering process needs some modification in the development style of web systems.

Web sites are giving information about organization, about business, about products in different angle, about education and presenting learning materials, number of different aspects. Nowadays all information is shared in the form of websites. Some are simple and single page websites, for these kind of systems development process is not tedious. But complex multipage with multi element system requires more time and cost to complete and more expertise required for handling different elements. The elements include text in different effect, images, animations, simulations, graphic files, audios, videos, etc.

There are number of models used for software system constructions. The process and limits of websites are different than process stages suggested by conventional software development methods. Web site development, accept more number of changes from customer also. So adoptable, simple and systematic methodology is required for complex website development process. The following sections describe it detail.

2. CONVENTIONAL SOFTWARE DEVELOPMENT PROCESS

The stages like analysis, design, coding, testing and maintenance are systematically followed in **Conventional software development process. Changes during** development are not accepted. There are various Software development models are as follows:

1. Waterfall model
2. Incremental model
3. V model
4. Spiral model
5. Iterative model
6. RAD model

3. DRAWBACKS OF CONVENTIONAL MODEL

In conventional software development models, the focus is more on coding than on design.

1. Testing website is different than the testing of other software system. Website is examined using its appearance and completeness in content.
2. Coding is more emphasized in Traditional methods. But website development process emphasize design.
3. Websites are not reachable and user-friendly without images, audio and video clips are not used.
4. Designing aspects and quality of Website design are not considered in traditional methods.

4. PROPOSED ARCHITECTURE: AGILE BASED WEB DEVELOPMENT MODEL

Web site development process is different from that of conventional software development process. Web applications deliver a complex array of content and functionality to a vast population of end-users. Web engineering model uses incremental development process as the requirements evolve over project time and changes will occur frequently. Incremental delivery of web applications allow us to manage the change. Using the available requirements the developers may develop a web application and release the first increment. Then the additional requirements are incorporated to the first release and the next increment is released and so on. This process may go on indefinitely because of the frequent changes in requirements. The agile based web development model is shown in the figure1.

This system architecture shows the simple and shortest way of developing the website. the following algorithm shows the way to develop a website.

Algorithm

Step 1. Start the process.

Step 2. Collect the idea of business process

Step 3. Collect all the requirements and start design in parallel

Step 4. Do the final verification

Step 5. Deploy the system in customer environment.

Step 6. Do the maintenance if necessary repeat the steps 1 to 5

Step 7. End

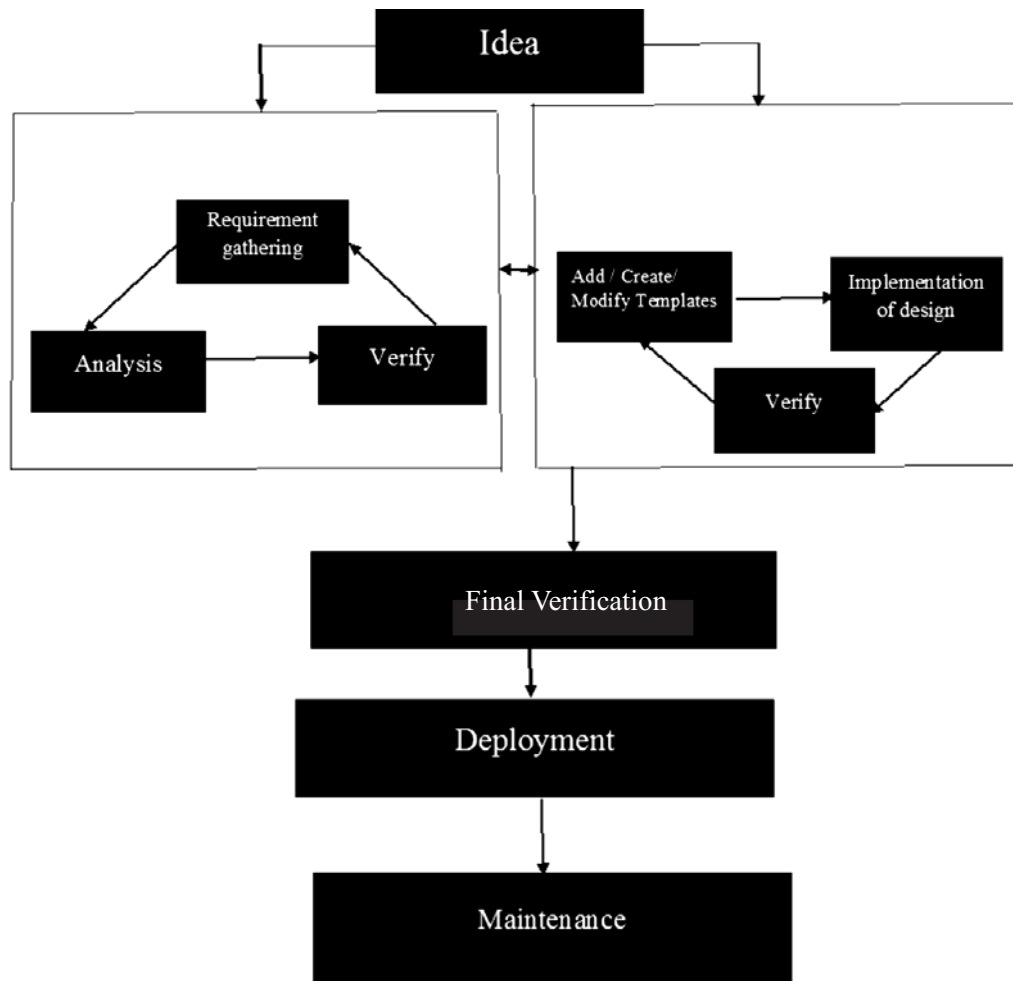


Figure 1: System Architecture

5. PERFORMANCE ANALYSIS OF PROPOSED WEB DEVELOPMENT MODEL

To analyze the performance of the proposed web development model, five projects were taken into account. These projects were developed using traditional method and the proposed web development model. For the traditional development process waterfall model is chosen. The cost and time required for completion of the projects are recorded. The same projects are developed using proposed web development model. Cost and time differences recorded. The result implied that proposed method is more suitable for website development.

Five websites are generated based on the internal client's requirements. These five sites were developed by 2 designers. The number of days required for each phase and total number of days taken out for completion also accounted. Cost is determined by the following Equation 1.

$$\text{Cost} = (\text{Unit Cost} * \text{number of designers}) * \text{Total Number days for completion} \quad (1)$$

The following Table1 Shows the Project Duration and cost of projects using traditional method

Table 1
Project Duration and cost of projects Using traditional method

<i>Phases\Website</i>	<i>Project 1</i>	<i>Project 2</i>	<i>Project 3</i>	<i>Project 4</i>	<i>Project 5</i>
Requirement	2	3	2	5	3
Design	3	5	3	3	2
Implementation	2	4	2	5	4
Testing	1	2	1	2	1
Implementation of Changes	3	2	1	2	1
Total(in terms of days)	11	16	9	17	11
Total(in terms of cost)	Rs. 22,000	Rs. 32,000	Rs. 18,000	Rs. 34,000	Rs. 22,000

The following figure 2 and 3 shows the graphical representation of Duration and Cost accounting of projects using traditional method.

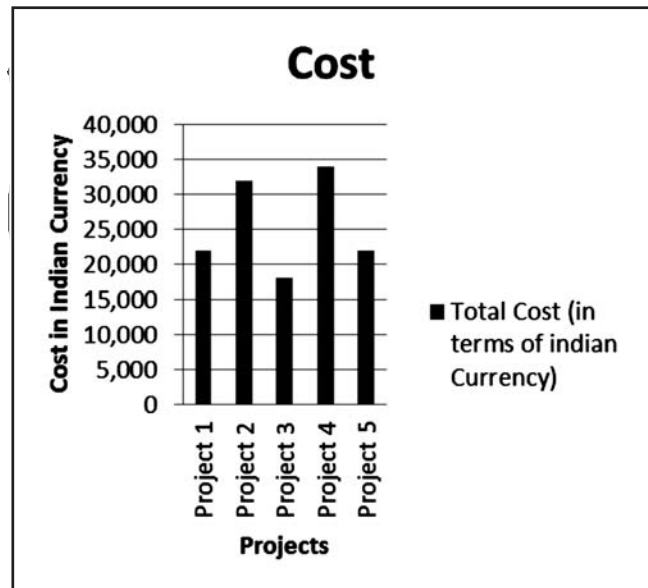
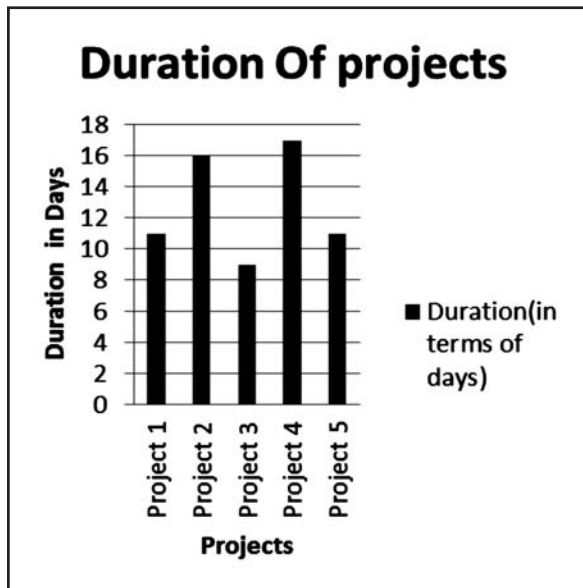


Figure 2: Duration Using traditional method

Figure 3: Cost calculated using Traditional Method

The following Table 2 Shows the Project Duration and cost of projects using Proposed Agile Web development method

Table 2
Project Duration and cost of projects using Proposed Agile Web development method

<i>Phases\Website</i>	<i>Project 1</i>	<i>Project 2</i>	<i>Project 3</i>	<i>Project 4</i>	<i>Project 5</i>
Requirement analysis and Design	3	5	2	4	2
Testing	2	2	2	4	3
Implementation of Changes	1	0	1	1	1
Total(in terms of days)	6	7	5	9	6
Total(in terms of cost)	Rs.12,000	Rs.14,000	Rs.10,000	Rs. 18,000	Rs. 12,000

The following figure 4 and 5 shows the graphical representation of Duration and Cost accounting of projects using Proposed Agile Web development method

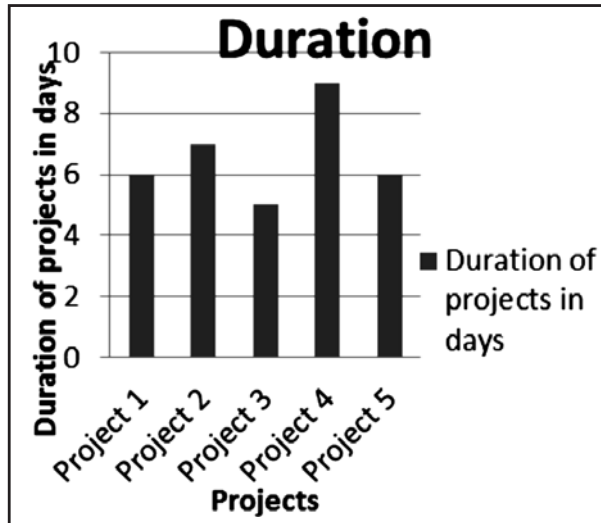


Figure 4: Project Duration using proposed Method

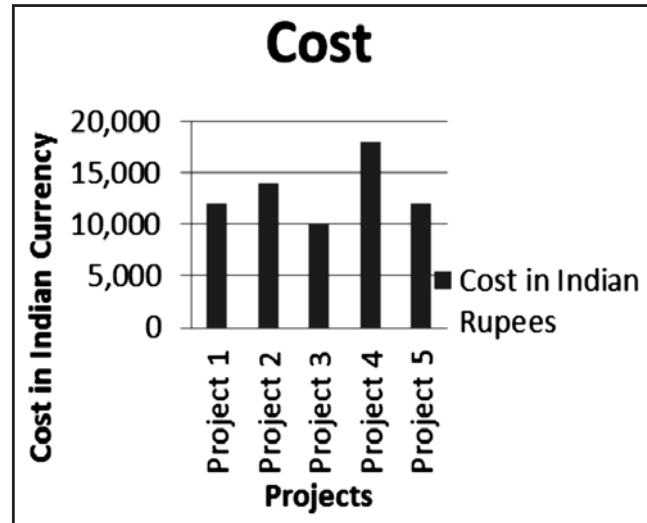


Figure 5. Project Cost using proposed Method

6. BENEFITS

It is more design oriented. Various images, audio and video clips may be used to make the website eye-catching. Very little computation may be required. Manual testing is performed using set of test cases and user requirements. It follows agile model, so requirements can be changed at any point of time. It reduces time constraint. Client Collaboration is highly recommended.

7. LIMITATIONS

This process can be used only for designing of websites and is not applicable for designing of mobile applications. It cannot be used for development of any other software. It focuses more on front end rather than back end.

8. CONCLUSION AND FUTURE WORK

In this paper we analyze the various factors that are needed for the designing of WebApps. By incorporating these factors to the conventional software process models, we get the development life cycle of website designing. Analyzing the performance of the proposed model, five websites are designed in conventional model and five websites in our proposed model and it implies proposed is more optimal one for website design.

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