Process Development and Integration through Incremental Process for Web Applications

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Abstract: In this paper we are suggesting a formal and effective approach for the development of web application through incremental model. As we are finding the incapability of development lifecycles of web application in other models. Web based application must deliver a complex array of content and a broad functionality to a wide population of end users. Web engineering is a process that is used to create high quality of applications .we suggest the solution for the demerits that are a raised with the v-model are resolved with the help of incremental model, also it is wide enough to allow s the end-user for any kind of modifications and updations at any point of time for fulfilling the current requirements and specifications.We are differentiating the merits and demerits of process model involved for the web app development.

Keywords: web applications, web design, webappliactiontesting, web engineering, process model.

I. INTRODUCTION

As, the web technologies plays a vital role of information processing over internet between the various systems for the past two decades. All the enterprise solutions, banking, educational, training, entertainmentand governments use the web application in a vast manner. Web access enabled system helps to improve, enhance and implement the task is simple manner. All the web application designing is not the easyjob, alsoit'snot simple to develop web application with the help of html or php, it is not just constructing web pages like menus, hyperlink pages, home screens, images and animations and others with the help of IDE's (integrated development environments) such as dream viewer, Myeclipse, Net beans and others. As the web application process development is complex during its evolution and must meet all the requirements specified. Althoughit's a challenging process of developing a web application.The complexity of the process development can be overcome by considering few measures during its development phases [1]:

- a) Gathering all the necessary requirements in proper manner and its highly challenging objectives.
- b) Analyzing the requirements specified for the application
- c) Planning, the critical phase in the development life cycle of web application.
- d) System design and web engineering
- e) Testing phase
- f) Quality assurance
- g) Performance
- h) Evaluations
- i) Maintenance and periodic updations.

Moreover the applications are designed for different users. Similarly the desktop applications that are developed satisfy a few specific layers of users. As this criterion must need to be met, the web application developer must have a solid engineering methodology for the web application development. Web application development process defined in WSDM as "web engineering methodology helps in creating initiation of infrastructure which allow evolvement and maintenances of a web system.

II. WEB APPLICATION -INCREMENTAL MODEL

The incremental build model [1]is a method of software development where the model is designed, implemented and tested incrementally until the product is finished. It is more opting model for designing web applications because web apps are to be modified frequently in the real world. It involves both development and maintenancesimultaneously. The product is defined as finished when it satisfies all of its requirements.



1.1 CENTRAL IDEA:

As the web development plays a vital in present days. Every transaction of banking, educational utilities-commerce and others are mostly uses the web application. Most of the web application uses the client-server based architecture and various network architectures are also implemented like one tier, two-tier, n-tier computer architecture are used for interaction of applications over the internet. The central idea [2] of the paper is that "whether the web development persists or not"? As in general development of web application for the web based system, there is great concern that we may face in the successful development, deployment, maintenance. As the application we are developing may lead to tangled web, in which the web applications which are poorly developed have higher probability of failure chances. To avoid such situations and achieve greater success in development and application of large scale complex web based system, we need follow the disciplined approaches and new tools fordevelopment [1]. And the actual idea of our paper is to outline the process model of web applications through incremental model

1.1.1 WEB APPLIACTION DEVELOPMENT PROCESS:

- A) REQUIREMENTS FOR DEVELOPING WEB APPLICATIONS
 - i. Defining web application [1], purpose, goals and direction: This step establishes the web projects clear direction and helps you focus on setting and achieving your goal.
- B) REASEARCHING AND DEFINING AUDIENCE SCOPE AND SECURITY DOCUMENTS
 - i. Type of audience for usability purposes: creating statistics repots of users
 - ii. Type and access level: creating an access report, specifying user's access of intranet/ internet
- iii. Type of audiences for planning the security level: creating a risk statistical report based on user's characteristics, application security.
- iv. Quantitative statistics on audience: creating potential users report and broken down by reasonable periodic time frames [23].
- C) CREATING FUNCTIONAL SPECIFICATIONS :

A web Application functionality specifications document is key document in any web application project. This document will provides all the functionalities and technical specifications that web application which requires accomplishing. This report gives rules and detail out of each type of user's behavior on a large project.[2]

- D) THIRD PARTY VENDORS INDENTIFICATION, ANALYSIS AND SELECTION: Tasks require researching, identifying and selection of third party vendors, products and services such as: Web application development company, Merchant account and payment gateway, SSL Certificate, Managed server, Server, network, Firewall, Load balancer Equipment, Fulfillment centers.
- E) TECHNOLOGY SELCTION, TECHNICALSPECIFICATION, WEB APPLIACTION STRUCTURE AND TIMELINES: This document is the blue print of technology and platform selection, development environment, web application development structure and framework. The technical specification document will detail out the technology used, licenses, versions and forecasts. TimeLine document identifies dates of completion.
- F) APPLICATION VISUAL GUIDE ,DESIGN LAYOUT ,INTERFACE DESIGN , WIRE FRAMING : this process starts out by creating the visual guide, wire framing or simply sketching out the user interface and interactions of the web application
- G) WEB APPLICATION DEVELOPMENT::
 - 1. Create the web application architecture and framework
 - 2. Design the database structure
 - 3. Develop the web application module ,libraries and classes
 - 4. Complete the development and implement all functionalities.
- *H)* Beta testing[1] and bug testing:

Web applications are thoroughly tested and any program bugs are addressed.

Web based application must deliver a complex array of content and a broad functionality to a wide population of end users. Web engineering is a process that is used to create high quality of applications. In addition the web application development requires a technical and managementactivities. The major issues that are fore comely to be discussed are as follows

- 1. What is a WEB APPLICATION?
- 2. Who develops it?
- 3. Why it was important?
- 4. What are the steps required for its development?
- 5. What is the final work product?
- 6. How can we ensure its performance and security and also its maintenance?

1.1.2 ATTRIBUTES OF WEB APPLICATIONS:

Web applications are the sophisticated computing tools that not only provide stand-alone function to the need user, but also have been integrated with cooperate databases and business applications.

- 1. Network intensiveness
- 2. Concurrency
- 3. Load unpredictable over the network
- 4. Performance
- 5. Availability
- 6. Data driven
- 7. Context sensitive
- 8. Continuous evolution
- 9. Immediacy
- 10. Security
- 11. Aesthetics

1.1.3 KINDS OF WEB APPLICATIONS:

There are majorly web applications are classified as the following ways.

- 1. Informational
- 2. Download
- 3. Service oriented
- 4. User input
- 5. Transaction-oriented
- 6. Portal
- 7. Database Access
- 8. Data Warehousing.

2.1.4 WEB APPLICATION ENGINEERING LAYERS:

PROCESS:

The process [3] is important to recognize that the problem must still analyzed, a design should be developed, implementation should proceed inan incremental fashion, and in an organized way of testing within that process

- 1. Embraces the changes.
- 2. Encourages the creativity and independence of development staff and strong interaction with web application stack holders.
- 3. Builds systems using small development teams.
- 4. Emphasizes evolutionary or incremental development using short development cycles.



METHODS:

Communication methods [4]: communication techniques are particularly important during requirement s gathering and web application increment is to be evaluated.

Requirements analysis methods [4]: these provide basis for understanding the content delivered by a web application, the functions to be provided by end-users, and modes of interaction.

Design methods: These methods encompass a series of design techniques that address web content, application and information architecture, interface design and navigation sources.

Testing methods: These methods incorporate formal technical reviews of both the content and design model and a wide array of testing techniques.

DEFINING THE FRAMEWORK [5]:

To be effective engineering process must be adoptable. We must recognize that framework of web application:

- 1. Web applications are often delivered incrementally. That is, framework activities will occur repeatedly as a result of each increment is engineered and delivered.
- 2. Changes will occur frequently: These changes may occur as a result of the evaluation of delivered increment or changes in consequences of business conditions.
- 3. Timelines are short: This militates against the creation and review of voluminous engineering documentation, but it does not preclude the simple reality that critical analysis, design and testing must be recorded in some manner.

2.1.5 Tasks INVOLVED:

These tasks are common to all the models.

- 1. Communication: helps to understand the objective.
- 2. Planning: required as many people (software teams) work on the same project but different function at same time.
- 3. Modeling: involves business modeling, data modeling, and process modeling.
- 4. Construction: this involves the reuse software components and automatic code.
- 5. Deployment: integration of all the increments



2.1.6 REQUIREMENTS FOR WEB APPLCTIONS:

The objectives proposed for requirements of web application:

- Identify content requirements
- Identify functional requirements

• Define interaction scenarios f or different classes of users.

ANALYSIS:

Information is gathered; it is categorized by user class and transaction types and then assessed for relevance. The objective is to develop lists of content objects, operations that are applied to content objects within a specific user transaction, functions that the web application provides for end users and other nonfunctional requirements.

Analysis Classes for WEB APPS:

The web applications will classified as:

- 1. The interaction model
- 2. The functional model
- 3. Configurational model

INTERACTION MODEL:

The most of the web applications are vastly used, between an end user and application functionality, content and behavior. The interaction model is composed of majorly (1) user-cases (2) sequence diagrams and (3) state diagrams. *FUNCTIONAL MODEL:*

The functional model [4] was addressing of two processing elements, each representing a different level of procedural abstraction 1. User observable functionality that must delivered by web application to the end users.2. Operational contained within analysis of classes which are implemented encompasses any processing functions. *CONFIGURATIONALLY MODEL:*

Client-side software [1] provides the infrastructure that enables access to the application from the end users location. Browser is a software is use to deliver the standards that exist. Each browser has it peculiarities. It is nothing more than a list of server side and client side attributes

III. AUTHENTICATION AND AUTHORISATION:

A single transaction in this scenario would proceed as follows:

1. User requests a

restricted service.

- 2. Web server asks browser for user credentials.
- 3. Browser prompts user for name and password, and resubmits the request with these user credentials.
- 4. Web server's access management module passes user's credentials to institutional validation system to check if the credentials are valid.
- 5. Web server's access management module collects user attributes frominstitutional directory system
- 6. Web server delivers the service.

The access management module maintains a cache of user credentials and attributesso that it need not contact the authentication and directory systems for every user requestUser credentials are kept in the browser until the browser is closed or until the user logs out.

IV. INFORMATION PROCESSING :

Based on recent approaches for model-based Web application development the Be Learning concept [6] demonstrates the integration of models into the design process of accessible eLearning environments. The "role" of accessibility for usability and the transfer of knowledge are extended with the concept of models to meet the requirements of Web-based teaching and learning. Together with appropriate mental models profiles for presentation, navigation and control of the Web application are possible which combine aspects of perception and interaction with aspects of thinking.

An individual is engaged in problem solving if the following three criteria are met.

1. Activities are goal directed

2. Reaching the solution or goal must involve a "sequence of processes" rather than one

3. The processes must be cognitive

V. NARRATING:

Internal evaluation of navigational (DOM)[8] or declarative requests (xpath, xquery) as well as concurrency control on large tree structures should be effectively supported to achieve efficient transaction protected processing or cooperative use of XML documents under a variety of XML language models. Furthermore, indexed access can also

take advantage of a suitable node labeling technique. In an XML document, the structure part typically carries a large amount of redundancy due to the verbose structural description; this is also true when the element/attribute names are replaced by voids used from a vocabulary. The often huge degree of path repetitions is not reduced by this standard format of XML document storage

VI. TESTING OF WEB APPLICATIONS :

The testing process will discuss in the following 4 phases.

1. Unit Testing^[1]: The unit testing is performed on the units while the programmer is coding them. We can consider unit as methods, classes that it is the bias of building system, testing them by tracing the code and discover faults then correct it. Testing also can include the reused methods and classes with its methods, or the Scripting codes that we use to enhance the capability of the system.

2. Integration Testing ^[1]: In integration testing the separately used methods, classes with its methods and scriptingcodes will be tested together to expose faults in the interfaces and in the interaction between integrated Components. Tracing here does in logic way, tracing which, methods call others and which classes inheritsother classes. Integration testing also includes the integration of pages and tracing the links between web pages and check that navigation go correctly.

3. System Testing ^[1]: System testing will compare thesystem specifications against the actual system. These means that we need to compare the system results with the mission statement goals we put it first. Mission Statement has one goal, testing process must be guarantee that the website satisfy the audience requirements and reach to the goal that we put in mission statement phase. System Testing has feedbacks from audience by using the Website in order to enhance performance and expose faults.

4. User Acceptance Testing^[1]: This is the final phase of testing, we carry the website to the real user's environment by upload it and hosting then test it using real data .the goal is to decide whether a system satisfies its acceptance criteria or not.

VII. STORAGE STRUCTURES AND MAINTANANCE:

XML data model allows for a great deal of modeling flexibility with which order, optional and multi-valued concepts, as well as deeply nested relationships can be captured. Hence, the resulting tree structures of natively represented XML documents exhibit large variations in breadth and depth.XML documents may be data-centric having relatively little 'content' stored as short text values or they may be document-centric where a single content node may contain huge portions of text. A document sent by a client arrives at a time, called block mode, where the document can be pre-parsed and analyzed before a storage structure is chosen—or it arrives at the DBMS interface in stream mode where fragments present, due to their size, have to be allocated in a suitable storage structure on disk before the entire "streamed" document is available for the DBMS [7]. In the latter case, the storage manager must decide based on imprecise structural information the storage structure to be chosen and, at best, can make some educated guesses based on context or sampling information. Web application maintenance services include:

- a. Testing and debugging.
- b. Corrective adjustments and bug fixing.
- c. Database maintenance and purging.
- d. Monitoring and real time management.
- e. Technical and functional enhancement.
- f. Re-engineering and reverse engineering.
- g. Productivity improvement analysis and deployment.
- h. Technical documentation.

TASK	AGILE PROCESS	INCREMENTAL PROCESS
Type of process model	Iterative and Incremental model	Incrementalprocess development
Approach of process development	Process is a time-boxed iterative approach	Process continues Until product is finished
Response of process model	Encourages rapid and flexible	Encourages rapid and flexible
	response to change	response to change

VIII. DIFFERENCE BETWEEN INCREMENTAL AND AGILE PROCESS

Process model type	Model combines elements of	Conceptual framework that promotes
	thewaterfall model with the iterative	foreseen interactions throughout
	prototyping	process cycle.
Testing phase	Launch able/application product at	Easier to test and debug than other
	the end of each stage is tested	methods of software development
Merits	These are good at reducing	This allows for more targeted and
	overheads, such as, rationale,	rigorous testing of each element.
	justification, documentation	
Demerits	Has benefit small teams with	Effective cost may exceed the cost of
	constantly changing requirements,	the organization.
	rather more than larger projects	-

IX. CONCLUSION:

It is generally easier to test and debug than other methods of software development because relatively smaller changes are made during each iteration. The time and money consumed by application downtime especially in the case of a critical process, is huge. These preempting issues that has the potential to cause downtime and also assists them in identifying areas for improvement. With the help of incremental model the Web applications are developed in an easy and efficient manner and the reusable components of web applications. Problems may arise related to system architecture which was not evident in earlier prototypes.

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