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Research Article

Integrating Rad-Model Into The Web Site Design Method (Wsdm)

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Abstract: Within the rapidly growth of internet, web-based applications are getting additional interest to investigate new and efficient methods to design and develop such applications. The Web Site Design Method (WSDM) is a followed process to develop web applications but it has the drawback of not including a testing phase within its lifecycle process. In this paper we are proposing an integrated model for WSDM with Rapid Application Development (RAD) model.

Keywords: RAD, Web Site Design Method, web based application

1. Introduction

The rapid growth of Internet activities makes it a part of the daily life agenda for individual, community, social and governmental agencies activities in all sectors [1], it became a powerful source and a useful tool for business, commerce, industry, banking and financial services, education, government, entertainment agency to grow and communicate effectively and improve its performance [2]. It is playing and progressively a high and important role in our personal lives [2].

Many old database systems and related information have been migrated to Internet environments and web-based systems all around the world. Therefore, a wide range of new and complex distributed applications appeared in web environment involving web-page design, web-page implementation, web-based system architecture, web information and retrieval, website systems, database, authorized or not authorized users for a certain web application and son on [3, 4]. Its global popularity stalks from the nature and features of the web itself has provided the illustration of information that may support linking all types of content with each other, ease of access for end users, as well as simple and easy content creation by using widely available tools [4,5].

Recently, the topic of web applications has been significantly and continuously used and developed in the commercial, educational, and governmental organizations. Also the same interest has reached the private, banking, and management sectors [6]. A wide-ranging list of websites are placed on the web every day in order to facilitate and improve their work, tasks, and applications as well as expand and enhance the work [6, 7, and8]

The process of designing a web application is not a simple thing to do. It is a challengeable mission which should satisfy a lot of requirements including system design, database used, web architecture, interface design, information retrieval, good quality, evolution capabilities, validation and verification, reliability, authorization assurance, performance, and maintenance [9].

Following the tradition software development models will cause a poor designed web application with a probability of a failure [10].
A good web engineering process is needed and this could be held by web application developers is the WSDN which is dedicated for developers to generate an infrastructure capable of evolution and maintaining web applications [11] by using scientific, engineering, and management principles as well as methodological methods that help in developing, deploying and maintaining systems and in order to ensure the design of web applications with high quality to achieve high-level success.

Still, there are countable differences in web site applications which may cause a web-crisis if same strategies or development models are followed for all of them.
Because of that, there is a big need to adapt newer development models for website development, a controlled systematic approach to develop systems for websites [10].

2. Problem Statement

Because of the rapid growth of internet [12], developing a web application needs rapid development process to be carried. This action may force developers to focus on reusable approaches or combining design with other components for their developing and implementation approaches [12, 13]. The required speed for the development process [12] and the lack of choosing a suitable engineering approach may lead to design and develop a web application with unqualified accuracy for the web application [6] or a even a poor quality web application [14-16]. However, web development must follow precise standards and methodologies [12] which may lead to create poorly designed web [17-21] and cause a web-crisis.

WSDM is a powerful methodology which depends on user-profile, obtaining user's requirements, documents, and models to create a structure for the website but it has the drawback of ignoring the testing phase while developing a website. Therefore, there should be specialized models or methodologies to design and develop a satisfied web application [22-27].

In this paper we are proposing an integration of WSDN with Rapid Application Development RAD model to provide the WSDN model with a testing phase to empower its facilities and quality [28-30].

3. Literature Review

10] Suggested an integration of V-model with WSDN methodology because of the absence of the testing phase in WSDN.

[17] Described a how the WSDM is modified to suit the web's semantic needs by using a semantic web technology (OWL) to describe the semantics of different WSDM methodologies in an official way.

[15] Discuss 14 of mostly known and used web and software development models and makes a comparison about their efficiency and suitability to reach a successful web development approach. The author argues that there is a difference between a web system development and the normal software development process and methodologies to reach a proposed framework and advice that there should be a special and reasonable development process for any web design model.
[16] presented a special of six phases website development process; mainly: requirements, content, design, development, launch, and maintenance for the German Jordanian University (GJU).

[12] argued that there should be specialized models to design a web-based application to satisfy the dynamic changes. Besides that, the authors discussed and compared many traditional software development models concerning the web-based development processes to reach a successful web-based development method [12]

4. Web Site Design Method (WSDM)

WSDM is a methodology to develop its websites and applications by using specific user requirements to derive website design and differs greatly from other methods used for other website design [18].

The development process is divided into four phases:

- User modeling: in this stage current users are classified and grouped in order to study the system requirements based on each user group.

- Conceptual design: a specific scheme is designed for each category to represent the static model used for the system. The navigation model is designed also to represent navigation capabilities,
- Implementation design: the conceptual design models are translated and converted into an abstract language that is easy to understand and interpret by the computer.
- Implementation: the resultant of implementation design is written by relying on a specific computer language. [19]

In WSDM, all visitors' requirements are considered as a starting point because the follow the audience-driven design philosophy. The user's navigation path and other gathered contents from the user's home page are put together and collected to become the required information of the user (audience). [20]

While other approaches use organization or database as an initial step which is called a data-driven approach, WSDM focus on user's requirements and needs as an initial step and uses this as the basis for structuring the data and the website.

4.1 WSDM Phases:

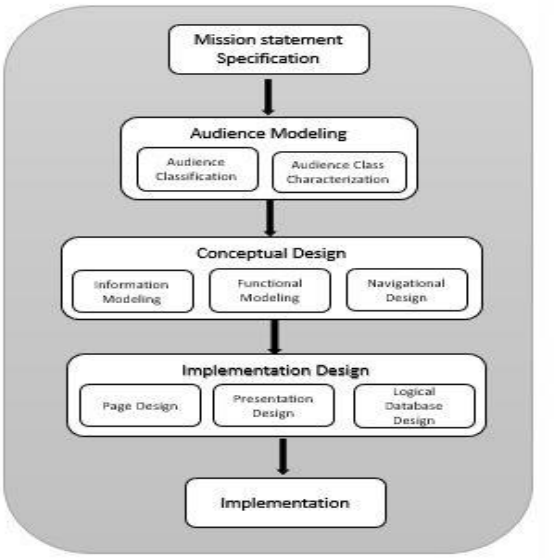

Figure 1: WSDM Phase's

-The Mission statement phase is used to determine the goal of the web application (the topic), and to determine the type of users that have been targeted [20]. The designer defines the clarity and design boundaries by answering questions like what is the subject, what is the purpose of the web site, and who are the target audiences.

The mission statement helps in expressing the purpose, theme, and primary audiences of the website. [18,21]

-The audience modeling phase depends on identifying and classifying the targeted users (audience) according to audience categories, based on user requirements which result in building this phase on specific characteristics [11, 20]. Here the users are taken as the mission statement, a primary point for departure reaching categorizing audience into a hierarchy category. [11] The process is done in two steps, namely: Audience Classification, and Audience Class Characterization [18,21]

-The Conceptual Design phase aims to describe the specification requirements of specific web application concept by using the information modeling sub-stage in order to define the functions and information for the web application. In the navigational design sub-stage, navigation paths are defined for all classes of the audience [20] The conceptual design contains the structure (conceptual) of the website as well as its modeling, and how a group of members from different audiences will be able to navigate through the website. [21]

The main goal of this conceptual design phase is to turn all the requirements which have been identified in the audience modeling phase into a high-level official description that can be used later to generate distinct and effective websites [11]. Mainly containing two sub-phase: task modeling and navigational design [11, 18, and 22].

-The Implementation Design phase gathers the information from the previous stages to create and complete the actual implementation automatically [20] having three sub-phases which are Site Structure Design, Presentation Design, and Style and Template Design [11,18]

-The Implementation Phase collect all previously collected information and consider it as input and the website is created automatically in the chosen environment as an implementation [11]

Implementation consists of realizing the physical website designed, the environment for the implementation (HTML, XML, ...) should be selected and then transfer the result of the implementation design to the environment that was chosen which could be done automatically depending on the difficulty and complexity of the model and the availability of usable tools [18]

5. RAD model

The RAD (Rapid Application Development) is considered as an incremental development model which adapt the rapid development of software using reusable components [23]
The whole RAD process model is illustrated in figure 2 [24]. It is the "high-speed" version of waterfall model which depends on the component-based construction approach to create a fully functional system in a short time.

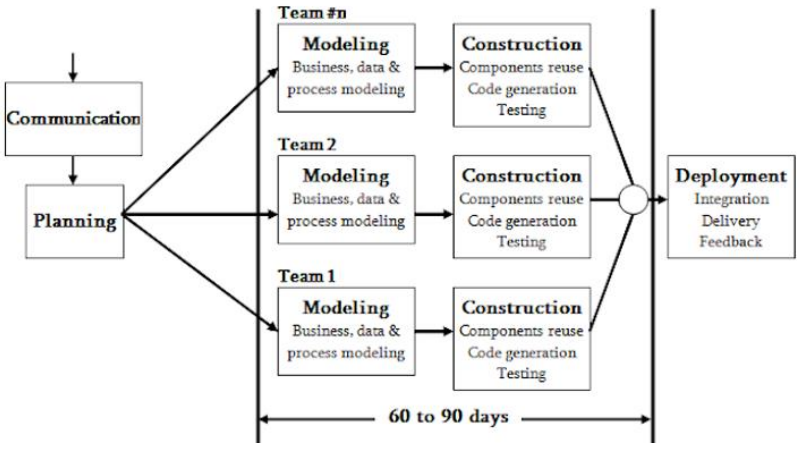

Figure 2: RAD Process Model

The rapid characteristic for RAD model makes it suitable to be integrated with WSDM model as it requires the rapid development too. Besides that, WSDM depends on reusable components as RAD [13, 14] and has the drawback of not containing any testing phase within the development process (figure 1).

6. The Proposed Model

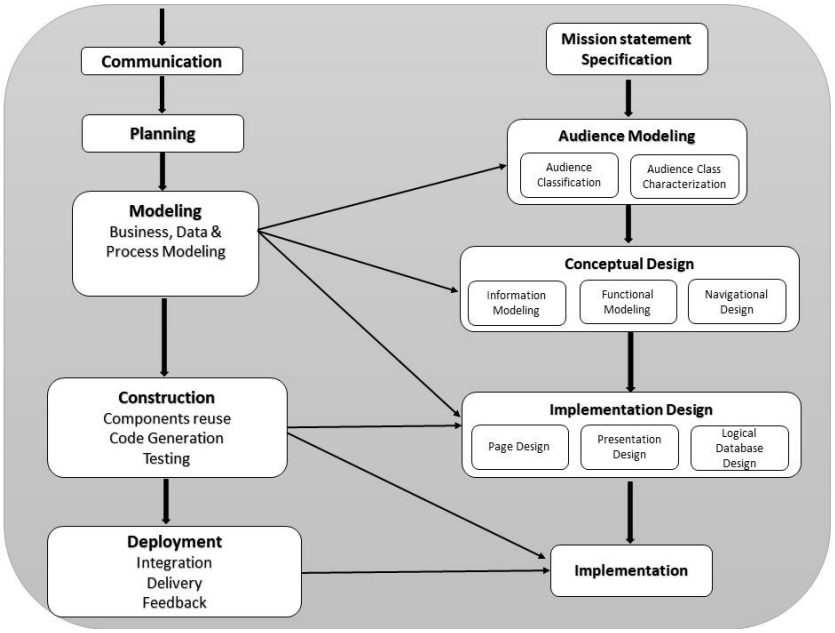

Figure 3: The proposed model

The main phases in RAD for developing a software could be integrated with the WSDM easily side by side within all its developing phases for its life cycle as it is show in figure 3. In the modelling phase, RAD is concerns with modelling business, data, and process which is convenience to be integrated with audience requirement modelling, the conceptual design, and for the implementation design concerning the website design as it fulfill its needs of information, functional, and navigation.

The next phase of RAD will be to implement the targeted software (construction) using component reuse, programming, and testing. This phase could be very suitable to be adapted and integrated with the implementation designs phase in WSDM, besides, it adds the feature of testing to it which is the missing option in WSDM.

The construction phase in RAD is useful to be integrated with the implementation phase of WSDM also as it consists of required sub-functions for it.

This is very suitable to be reached by integrating RAD and WSDM in this step, so as to reach an efficient design and meet the requirements.

The final phase in WSDM now is reached and implementation is done with testing, reaching the deployment phase in RAD also after integrating and delivering the final product.

7. Conclusion

In this paper, we propose a model of integrating the of RAD model into the Web Site Design Method (WSDM) to design a website application.

WSDM is a suitable and rapid method to design a website application but it focuses on the designing matters from different perspectives and user requirements to derive website and has the drawback of not taking the testing approach into consideration.

RAD application has the facility of rapid development and reuse component besides having the testing phase within its lifecycle process. These characteristics makes it suitable to be integrated with WSDM in developing successful web-based applications.

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