WPRiMA Tool: Managing Risks in Web Projects

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Abstract—Risk management is an essential fraction of project management, which plays a significant role in project success. Many failures associated with Web projects are the consequences of poor awareness of the risks involved and lack of process models that can serve as a guideline for the development of Web based applications. To circumvent this problem, contemporary process models have been devised for the development of conventional software. This paper introduces the WPRiMA (Web Project Risk Management Assessment) as the tool, which is used to implement RIAP, the risk identification architecture pattern model, which focuses upon the data from the proprietor's and vendor's perspectives. The paper also illustrates how WPRiMA tool works and how it can be used to calculate the risk level for a given Web project, to generate recommendations in order to facilitate risk avoidance in a project, and to improve the prospects of early risk management.

Keywords—Architecture pattern model, risk factors, risk identification, Web project, Web project risk management assessment.

I. INTRODUCTION

The World Wide Web has had a massive and permanent influence on our lives. From the economic sector to the entertainment world, hardly any part of our daily lives has been unaffected by the World Wide Web, or Web for short [1]. Walker and Betts postulated that the Internet, and more specifically the Web, will be the key to a change in global construction business in the near future and will affect professions, collaboration, and the construction business structure [2].

Despite some similarities to traditional applications, the special characteristics of Web applications require the adaptation of many software engineering approaches or even the development of completely new approaches to make it possible to plan and iterate Web application development processes [3]. It is thus pertinent to note that the success of Web applications development projects is highly dependent on resolving problems and fulfilling stakeholders' needs in a cost effective and time efficient manner [4]. In this regard, the quality and capabilities of Web project management have become the defining factor in ensuring the success of the relevant stakeholder organizations [5]. Thus, the main target of web project management is to optimize the presentation of information, its access, and the functionality of a web application, as well as to organize all domains risk management is an essential and significant component of project management [1].

Risk management is an essential fraction of project management and plays a significant role in project management [6]. In fact, there is no such thing as a project without risks and problems simply because "If a project is successful, then it is not successful because there were no risks and problems, but because risks and problems have been handled successfully" [7]. Generally, the main reasons for delays or total failure of Web projects are identical to the risks and problems identified and constantly updated by Boehm [8]. Effective management of these risks currently appears to be the most important area of Web project management [9].

Web project development is still in its infancy and as such, lacks for process models that can serve as a guideline for the development of Web based applications.

To solve this problem, contemporary process models that have been devised for the development of conventional software have been widely adapted for use. [10]. For this reason, there is a need to improve appropriate risk management techniques and tools for Web projects to reap the maximum benefits and avoid potential pitfalls in the process of developing Web application.

To satisfy this need, this research proposes new tool to managing risk in Web project based on a risk identification architecture pattern model (RIAP), created in our previous work [11]. Risk identification architecture pattern model for Web projects centered on the point of view of the data proprietors and vendor's perspective and uses a probabilistic approach (based on Bayesian networks) for risk management assessment. Together with this, and in order to put our model into practice, we have orientated our work towards the construction of a tool that implements it. We have thus designed WPRiMA (Web Project Risk Management Assessment) tool.

The main contributions of WPRiMA tool are to identify and calculate the posterior probabilities level of risk evidence for a given Web project and to calculate the risk level for given Web project in order to facilitate risk avoidance in a project, and to improve the prospects of early risk management. In addition to provide information about the risk that influences their concerning attribute and to generate recommendations through which to improve the risk management in a Web projects.

The paper is structured as follows. Section 2 briefly describes the RIAP; Section 3 describes the WPRiMA tool and explains how Web projects data consumers and developers can use WPRiMA. Section 4 contains the validation for WPRiMA tool. Finally, Section 5 shows the conclusion and future work.

II.   RISK IDENTIFICATION ARCHITECTURE PATTERN MODEL (RIAP)

RIAP is a risk identification architecture pattern model for Web projects which focuses upon the data from the point of view of the proprietors and vendors (see Fig. 1).
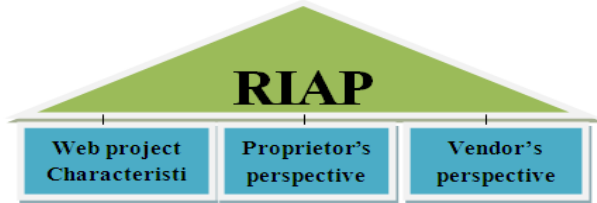

Fig.1 Basis for the construction of RIAP

Definition of RIAP comprises two sections. The first section constitutes the theoretical definition. The main goal of the first part is to identify risk factors threaten Web project development then assess the relevancy of each risk factor to the characteristics of the Web project that were obtained particularly for the Web project [11]. The second part is about managing operational risks and it concentrates on the utilization of Bayesian networks (BN) as a tool to explore the causal relationships between risk factors and its parent risk factor (see Fig. 2).
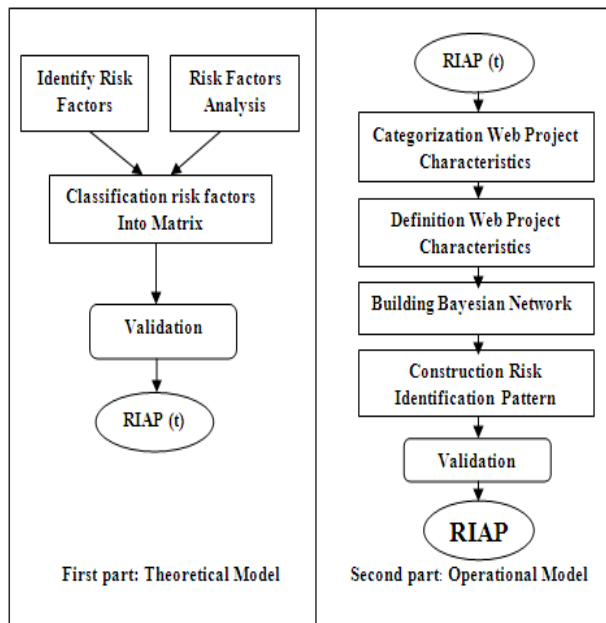

Fig. 2 The development process of RIAP

The first section comprises four phases. The first phase involves the conduct of a survey to explore the risk factors confronting Web projects from the proprietor and vendor perspectives (see Fig. 1). The second phase considers the risk factors analysis, in order to assess the relevancy of each risk factor to the characteristics of the Web project. The third phase obtains a matrix in order to classify the Web risk factors. The fourth phase involves performing the validation. The possible risk factors are shown in Fig. 3.

F1- Built on emerging technologies and methodologies.
F2- Continually changing project /scope / objectives.
F3- Continually Users request changes.
F4- Complexity of designing models increases by using mobile devices.
F5- Customer had been actively involved in build decision of components.
F6- Development team unfamiliar with selected development tool.
F7- Developers are often no longer available.
F8- Design of Web pages are not supported by the available technologies.
F9- Difficulty in defining the input and outputs of the system.
F10- Difficult in defining content and functional requirement.
F11- Difficult to navigate and find information.
F12- Difficulty in Web applications maintenance.
F13- Difficulty of operation and simplicity.
F14- Duplication in content
F15- Different sources are often not heterogeneous at various levels.
F16- Different hardware platforms often differ from a project to another.
F17- Few details are known about the properties of component sources, content or functionalities.
F18- Frequent conflicts among development team members.
F19- Hardware not compatible with other systems and future versions.
F20- Hardware limitation to meet requirements.
F21- Hard to predict operational environment.
F22- Hard to term possible threats from competitors.
F23- High time pressure to market.
F24- High level of technical complexity.
F25- Immaturity of new technique.
F26- Lack of an effective Web project management methodology and tools.
F27- Lack of defined user categories.
F28- Lack of Providing Data Privacy and Data Security.
F29- Lack of an effective Web project cost, effort and size estimates tools.
F30- Lack of Design consideration such as reliability, safety, security.
F31- Lack of testing tool for Web application.
F32- Lack of intellectual property rights.
F33- Lack of development team skills.
F34- Lack of top management support for the project.
F35- Lack of an effective Web project risk management tool.
F36- Large volumes of information.
F37- Legacy systems are poorly documented.
F38- Many external suppliers involved in the development project.
F39- Meet user's expectation to have accessibility around the clock daily.
F40- No explicit objective about the Web project.
F41- No explicit definition about the standard of project quality.
F42- Project manager do not have a clear vision of the project.
F43- Project manager not experienced in the application area.
F44- Project manager not aware of the need to develop and maintain good working relationships with client.
F45- Products are seldom tested comprehensively thus difficult to control.
F46- Lack of aesthetics in content.
F47- Lack of cooperation inside the development team
F48- Lack of communication among owners.
F49- Lack of understanding delivery medium concept.
F50- Lack of understanding on the roles and responsibilities of each team member.
F51- Some requirements are technically difficult to implement.
F52- Subgroups are not structured according to components but according to the expertise.
F53- Time and location from where the applications are accessed cannot be predicted.
F54- Too many departments involved in project.
F55- Very large number of component sources.
F56- Web developers have a variety of backgrounds, experience and age.
F57- Web developers have high degree of individuality.
F58- Web project teams are considerably young.

Fig.3 Risk factors in Web projects

The results of the first section are used as an input for the second section, which is subsequently used to transform the theoretical definition into an operational definition. In order to do this, we utilized a probabilistic approach by means of a BN. By utilizing this BN, we can assess influence or dependence between risk factors and their parent risk factors to generate risk patterns.

Building BN comprises four phases. The first phase was to arrange the Web project characteristics into three dimensions: "Product", "Usage", and "Development" [12]. By assigning the different characteristics of Web applications to these dimensions, we can observe their impact on the quality of Web applications. In other words, these characteristics can serve as a referral point for the definition of risk in a Web project. The second phase, we generated a new level in the BN based on the separation of the Web application characteristics into necessary resources [13]. Our aim is to establish which characteristic in a category had a direct influence on characteristics in the same category, and eventually on characteristics in different categories. Each relationship is support by a premise that represents the direct influence or dependence between a characteristic and its parent characteristic (see Table 1). The third phase, which is building BN, involves graphical structure for Bayesian network and Definition of node probability (see Fig. 4).

TABLE 1
RELATIONSHIPS IN THE CATEGORY OF RISK FACTORS

| Dimensions For Web Applications Characteristics	Characteristics Of Web Applications	Important Resources Of Web Applications	Risk Factors In Each Web Applications Resource
Product	Content	Document Character	F1-F2-F3-F9-F10-F14 -F26-F36-F46-F41
		Quality Demands	F5-F31-40-F41
	Hypertext	Non-Linearity	F11-F13-F49
		Misinformation	F11-F13-F26-F36-F40
	Presentation	Aesthetics	F13-F27-F28-F30-F32-F46
		Self-Explanation	F3-F11-F13-F26-F27-
Usage	Social Context	Spontaneity	F13-F39-F41-F46
		Multiculturalists	F27-F36-F39
	Technical Context	Quality Of Service	F9-F10-F24-F28-F31-F32-F41-F49
		Multi-Platform Delivery	F1-F12-F16-F19-F24-F25-F39-F49
	Natural Context	Globality	F28-F30-F32-F53
		Availability	F12-F13-F20,F28-F39-F49-
Development	Development Team	Multidisciplinary	F18-43-F44-F47-F48-F50-F52-F54-F56
		Young Average	F6-F18-F33-F43-F44-F47-F50-F56-F58
		Community Development	F18-F22-F26-F35-F42-F48
	Technical Infrastructure	In Homogeneity	F3-F21-F27-F53
		Immaturity	F8-F21-F24-F25-F31
	Process	Flexibility	F2,F3,F24,F29,F35,F40,F50,F51
		Parallelism	F23,F50,F52
	Integration	Internal Integration	F1-F5-F7-F8-F22-F26-F29-F37-F55
		External Integration	F1-F15-F17-F22-F38-F55
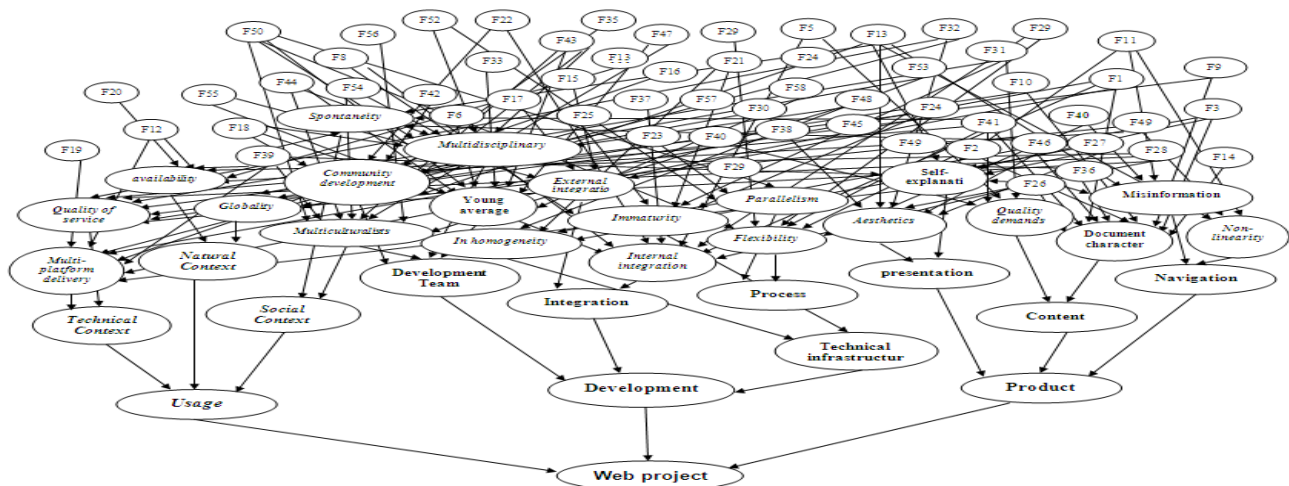
Fig. 4 Bayesian network graph

Once the BN is built, the fourth phase is to construct the RIAP. Upon an evaluation of all identified risk factors in the sub-network and the relationships between them and the Web project subgroups, we can build architecture risk patterns by assigning identified risk factors to architectural subgroups based on their relationship, responsibilities and interplay. In general, patterns are derived from the experience of identifying same or approximate risks in a continuously exponential manner [14]. Such lessons that are learn from each sub-network risk factor and Web project subgroup are then refined and improved or freshly redefined to ensure that the most appropriate course of action can be institute to confront future risk-endowed challenges [14].

The risk identification architectural patterns have been defined with our own risk process. The risk process was defined as a causal chain of risk factors that ends with the occurrence of a risk loss. The causal chain includes identifying the important resource that contain effected risk factors, the Web project characteristic that have that resource and the dimension including that characteristic. In addition, we seek to identify the quality attributes of project output.

The purpose of identifying Project quality attributes is to identify the risks as well as the risk reasoning for not achieving the objective of the project. These attributes are significant to both the stakeholders and vendors according to their own perspectives. Over and above it is to identify and

exploit opportunities and challenges of Web project. As an example, the risk patterns defined according to risk process are giving below. A natural language clarification is given in curly brackets.

- If project <**dimension**> builds on emerging technologies <**risk factor**> then document character <**important resource of Web application & characteristics of Web project**> loss understandability <**project quality attributes**> loss accessibility <**project quality attributes**> and loss usability <**project quality attributes**> loss testability <**project quality attributes**> loss adequate functionality <**project quality attributes**> and then and then loss conformity to project expectation < **project quality attributes** > .
{Construction on up-and-coming technology decrease document character understandability, accessibility and usability and reduce product adequate functionality, testability and then loss conformity to project expectation}.

  a) If project <**product**> has difficult to navigate and find information <**factor**> then misinformation navigation <**hypertext**> loss accessibility <**user view**> and globality <**user view**> and simplicity <**user view**> and then loss user loyalty <**Business view**>.
{Not easy to navigate and discover information result in loss navigation accessibility, globality, simplicity and then loss user loyalty}.
  b) If Project <**product**> loss adequate design consideration <**factor**> then self-explanation <**presentation**> loss simplicity <**user view**> and loss reliability <**user view**> and vogue <**user view**> then loss conformity to project expectation <**business view**>.
{Insufficient design considerations reduce presentation reliability, simplicity, vogue and then loss conformity to project expectation}.

As soon as fourth phase in the building of operational model has been complete, the fifth phase consisted of the validation of RIAP. For this reason, we performed a case study that allowed us to identify risks repeatedly in an actual Web project using the proposed model. Based on results we adjusted our model until it was constant. More details about how we achieved the operational RIAP can be found in [11].

Once the risk identification architectural patterns was completely defined (the patterns and the probability tables), we decided to implement it with a tool in such a way that any team could manage the risks in any given Web project. This tool name WPRiMA and will be present in the following section.

III. WPRiMA: A WEB PROJECT RISK MANAGEMENT ASSESSMENT TOOL

WPRiMA is the tool, which is use to implement RIAP. We have constructed this tool in order to achieve three objectives: (a) to facilitate risk avoidance in a project, and to improve the prospects of early risk management, (b) to prove the validity of RIAP in the risk management evaluation of Web project, (c) to show that it is effectively representative of the data proprietor's and vendor's perspective .

A key feature of WPRiMA tool is that we are able to adjust both particular probabilities based on objective data. Having entered the probabilities to each risk pattern, we can now use risk pattern probability to do different kinds of analysis. Risk pattern probability is all about adjusting probabilities in the light of real observations of actions by using Bayesian Theorem. In this state, the adjusted belief is calling the posterior.

The tool considers different Web projects domains. In this way, risk patterns can be evaluated depending on the domain to which the Web project belongs. This is conduct by using the appropriate probability tables for each domain. Finally, the application not only gives information about risks in the Web project, but also analyzes certain quality attributes that should be well designed in order to improve that Web project success.

WPRiMA tool was built by using three-tiered architecture to separate the presentation, application, and data components, using java. By means of the presentation tier, the tool provides an interface for the Web project participants allowing them to identify and analyze the attributes that they have a vested interest in them. The data tier corresponds with the database in which the results of various risk patterns are stored. In this level only the expert domain, Web engineering or architects who allow them to identify, generate, modify, add, asses and analyze risk patterns (see Fig. 5). In general, patterns are derived from the experience of identifying same or approximate risks in a continuously exponential manner. It should be noted that each risk scenario could be redefined and used as a pattern to extract scenarios that are more specific. Finally, the application tier is designed for information engineering, graphics design, hypermedia engineering (linking, navigation), requirements engineering, usability engineering.
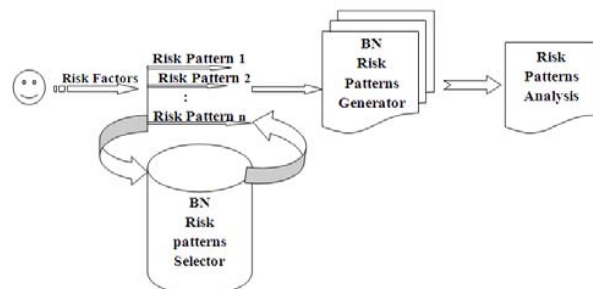

Fig. 5.The WPRiMA architecture

The data tier identifies and calculates the risk patterns for the Web project under study, stores the results, generates the inputs for the second application and informs the other participants when the evaluation has been completed. The second application loads and executes the appropriate risk patterns (corresponding to the Web project domain) and sends back the results to the data to be stored. The Web project evaluation is made by considering the domain to which it belongs. Thus, for each evaluation, the project domain should be known. The tool uses the domain given to select the appropriate BN. The differences between one domain and

another are given by the definition of the probability tables. In the next section, each of the tiers used to derive WPRiMA tool are further explicated upon.

A. Architecture of data component

In this phase, WPRiMA tool offers support in the following areas:

BN risk patterns identification: The expert domain identifies the risk factors from risk list. The risk list divided to three groups. Each group presented the risk factors in one dimension. Consequently, the risk patterns are automatically select based on the identified risk factors from risks lists. Each pattern contains the probability for the subgroup that presents (corresponding to the Web project domain). Once the risk patterns identified automatically, the patterns are classified based on their prior probabilities in each Web project characteristic.

BN risk patterns generator: In this phase, the selected risk patterns in each Web project characteristic combined in one risk pattern. As a result, we will have several new generated risk patterns that each generator pattern presents one of each subgroup in original Bayesian network (see Fig. 6).
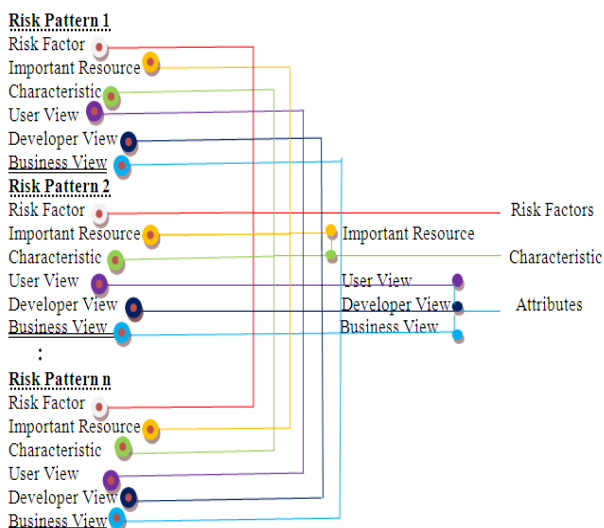

Fig. 6.The BN risk patterns generator

As an example of the risk patterns defined according to risk process, is given below:

If product < **product** > has large volume of information <**factor** > and loss explicit definition < **factor** > then navigation misinformation < **hypertext** >.

The idea behind the generation of risk patterns is to know the posterior probability for each risk. This can be done by entering any number of observation in anywhere in the new generated risk pattern, and use it to update the probabilities unobserved variable and the prior probabilities by using Bayesian theorem manually or use any of Bayesian network available tool. The entering of evidence and using it to update the probabilities in this manner, it is called propagation. This propagation can produce some exceptionally forceful analyses

that are hard to find with other kinds of reasoning and classical statistical analysis methods.

Risk patterns analysis: In this phase, WPRiMA tool provide automatically risk analysis by assigning the risk factors to each attribute in each characteristic based on their sensitivity identifying the risk reasoning for each attribute. In addition, WPRiMA tool provides the attribute probability. To calculate the attributes probability and risk sensitivity we have established an analysis model that comprises a formula that provides us with a numerical value and a Decision Criteria. This will later allow us to determine the degree of risk level for each attribute (see Fig. 7).
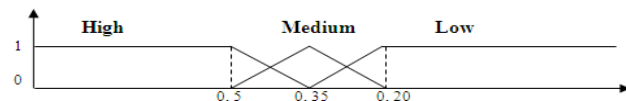

Fig. 7 Decision Criteria

The attributes probability and risk sensitivity can be calculate using these equations.

Risk sensitivity =
$$\frac{\Sigma \text{ (number of patterns} \times \text{probability of selected pattern)}}{\text{total number of selected patterns}}$$

- Σ Number of pattern: it means the total of risk pattern that contains selected attribute.
- Probability selected pattern: it means the probability (obtained in data tier) of selected pattern that contains selected attribute.

Attribute Probability =
$$\frac{\text{number of patterns}}{\text{total number of selected risk patterns}}$$

As a result, we have obtained the following values for representing risk sensitivity level: High $\geq$ 50%, Medium $\geq$ 20% and Low < 20percentage.

The layout of risk patterns analysis generates the inputs for the second application and notifies the participants when the evaluations have been complete. The second application loads and executes the appropriate risk patterns (corresponding to the Web project domain) and sends the results to the first application to be document.

Documenting Risk patterns: In this phase, the expert domain has to modify, assess or add new risk patterns based on the result evaluation and send it back from other tiers. Once the evaluation is done, the expert has to document the result. A single, broad risk pattern document is possibly going to become shelf ware and will not provide the target of communication. Therefore, we will be designing different views of architecture like conceptual architecture, logical architecture and execution architecture, which could help documenting.

a) **Conceptual Document:** The aim of the conceptual document is to afford a helpful vehicle for communicating the architecture to non-technical audiences, such as marketing, management and other users. It consists of the

attributes that he is interested in. Moreover, it contains non-technical specifications for risks in each attribute and the past reports.

b) **Logical Document:** The logical document provides an in depth detail "blueprint". It incorporates the detailed attributes, risk factors and risk sensitivity, reasoning, and probability for each attribute, along with discussion and clarifications of procedures. It also provides participants with previous reports.

c) **Execution Document:** Execution document is created for distributed or concurrent risks and their probability based on each domain. It is show the mapping of risk factors onto the nodes of the RIAP. Moreover the probabilities for risks and other variables and the final results.

B. Architecture of Presentation Component

Presentation tier in the tool provides an interface for the non-technical users, which allows them to carry out two tasks: users can start evaluation attributes that what he is interested in, and can seek informal specifications for risks about the previous evaluations.

C. Architecture of Application Components

Web applications are developed in tandem by the various subgroups of the development team. In contrast, in traditional software development these subgroups are structured according to components and not according to the respective individual's expertise [11].

Due to the varied goals of the different participants involved in a Web project, there is a concomitant increase in the levels of complexity. This can be seen in the differing perspectives adopted by each participant. For instance, the client is more concerned with costs and budgetary considerations while a project manager may be more focused upon project duration and the availability of resources. On the other hand, graphics designers are likely to be more concerned with the visual and aesthetic appeal of the application in contrast to programmers who are usually concerned with the functional aspects, content integration, layout, and application logic. To satisfy their need this stage of tool provides each subgroup with the risks factors that influence their concerning attributes. Moreover, it permits them to obtain a series of recommendations that will help them to improve the level of risk management. Use of this tool will provide the different participants involved in a Web project with, the following benefits:

a) Discovering the risk factor in the project from different perspective.

b) Ranking the risk factors based on there sensitivity.

c) The probability of their interest attributes.

d) Discovering the risk factor reasoning.

e) Upon discovering the risk factor of a project, they will be able to get a series of recommendations that will support them to enhance the risk management in the project.

f) Past reports help to controlling the risk management level in the project evolves with time.

As previously indicated, once the first tire was finished, the second application has ability to load and execute the appropriate risk patterns (corresponding to the Web project domain) based on their concerns. Table 2 shows example of layout for the efficiency attribute that was analyzed.

TABLE 2
LAYOUT FOR THE EFFICIENCY

Scenario #	: T7	
Scenario	: Document character loss efficiency	
Attribute	: Efficiency	
Characteristic: Content		
Probability	: 0, 2410	

Risk Factor	Risk Sensitivity
1. Built on emerging technologies and methodologies	High
2. Difficulty in defining the input and outputs of the system	High
3. Lack of an effective Web project management methodology and tools	Low
4. has developers have different background experience and edge	Medium

Reasoning
• Construction on up-and-coming technology decrease document character understandability, accessibility and usability and reduce product adequate functionality, testability and then loss conformity to project expectation
• Without define system input and output the document character cannot be efficiency complete, and then product loss clarity, adequate functionality. And then resulting in unsatisfactory product
• Without effective methodology and tools result in poor document character reliability, clarity, testability maintainability, reusability and then loss conformity to user expectation
• Developers have different background experience and edge results in multidisciplinary development team poor communication and cooperation. And then project development cost more time than excepted

Recommendation
• Define various components of scope, such as what departments are affected, what deliverables are expected, what type of information is required.
• Begin to define business requirements at a high level and then work upward to define scope.

IV.   VALIDATION OF WPRiMA

To empirically validate our tool, we performed an experiment, which consisted of two different strategies in order to evaluate the level of the risk factors in a given Web Project. One of the strategies was to evaluate the risk factors with a group of subjects, and the other evaluated it with WPRiMA. Next, we compared the results obtained to determine whether the evaluation made with WPRiMA was similar to that made with the subjects. In other words, it attempted to verify whether the tool represented the data from proprietors' and vendors' perspectives.

Therefore, for the first assessment strategy we developed an experiment to obtain the judgments of a group of subjects about risk factors associated with the Web project development in their university.

For the second assessment strategy, we used these data in our tool to allow us to automatically measure the quantifiable risk patterns and, from the values obtained, to obtain the entry data for the generator risk patterns that will give us the evaluation of WPRiMA tool. In the following sections, the experiment, the automatic evaluation and the comparison of both results will be examined in detail.

A. The Experiment

The subjects of this the experiment were a group of students from Yarmok University in Jordan. The respondents comprised thirty-five final year students from the School of Computer Sciences. The objective of the project was to build a portal for their school. The experimental material was composed of one document including the instructions, motivations and a list of 58 factors. From this experiment, we were able to obtain twenty-eight risk factors. We used the student's responses to define risk probability. Three categories

of risk factors delineated. The high risk factor category comprised risk factors acknowledged so by more than 50% of the responses. The moderate risk factors category comprised of factors acknowledged so by less than 50% of the responses and more than 30% of the responses. Finally, the low risk factor category consisted of factors acknowledged so by less than 20% of the responses.

B. The Automatic Evaluation

First, it is necessary to obtain the probability for each given risk factors which can be done by selecting the risk patterns that belong to these risk factors. After that, the BN risk patterns were generated. Once the BN risk patterns were generated, the selected risk factors probabilities were entered into the BN generated risk patterns. From each piece of evidence and by using the risk patterns probability table, each node forms a result that is propagate, through a causal link, to the child nodes for the whole sub-network that the generator risk pattern represented. As result, we will have posterior probabilities for risk evidence.

C. Comparing the Results Obtained

By comparing the results obtained with the two evaluation strategies, we could notice some differences between the results of the first strategy and the result of the second one.

This, in our point of view, is because that the prior probability given for the risk patterns are, in some cases, extreme. A preliminary interpretation of these results is that WPRiMA is more demanding than the subjects are and needs to been adjusted. Thus, we tried to decrease these differences by adjusting the NPTs for risk patterns and recalculating the risk patterns generators. As a result of this new configuration, the general result of the automatic evaluation is closer to the subject's evaluations. We also need to repeat the experience carried out on just one Web Project in order to be sure that the risk patterns accurately estimates the posterior risk for any Web project.

V. CONCLUSION AND FUTURE WORK

In this paper, we have briefly explained an RIAP model for Web projects, which is, based upon the data proprietor's, vendor's perspectives, WPRiMA, and the tool that implements it. There are three main functions for WPRiMA. Firstly, to calculate the risk level for a given Web project in order to facilitate risk avoidance in a project, and to improve the prospects of early risk management. Secondly, to provide information about the risk evaluation made by the tool.

Finally, to generate recommendations through which the risk management in a Web projects can be improved.

We believe that one of the advantages of our model will be its flexibility. Actually, the idea is to develop a model that can be customized to both the objective and the context of evaluation. From the objective perspective, the participant can select the attribute that he/she is concerned with. Moreover, it allows them to get a sequence of recommendations that will help them to enhance the level of risk management. On the other hand, and from the context perspective, the parameters (NPTs) can be modified to take into account the specific context of the Web Project evaluated.

As a future work, we will incorporate new domains by defining and including the corresponding probability tables in WPRiMA.

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