SOLVING ISSUE IN WEB-BASED APPLICATION PROJECT

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Abstract

As part of our PhD thesis assignment, we undertake a series of interviews, surveys and observation in independent companies that are involved in web-based product development. During our investigation, we come to know about some recurrent problems, understand the main issues, analyses how the companies deal with it and propose a series of solution to relieve to the difficulties discover. This paper will present our finding during that phase. These investigations were conducted at Bangalore and Mangalore, two tech-cities of India.

Introduction

According to Internet World Stats [www.internetworldstats.com]; the Web's growth and widespread adoption is from 16 million users in December 1995 to almost 1.5 billion users in June 2008. Businesses today are more and more aware of the power of internet has to bring in new customers and also increase the number long term customer relationships. So, the demand of websites and web application with more complicated functionalities is increasing and many ways to address this demand come to live.

The emergence of Web Application, which has entered in major sectors of online retail sales, is drastically changing the economics of web-application. These programs allow the user and the company to stay close from each other by saving time and space for customer services, products sales, community built, etc. Businesses, institutions, governments, etc. are quickly migrating all of their services, applications, stores, etc. to a web environment that will allow their customers and users access to all this from the Internet[1].

Web applications are use without having to install it on a local hard drive in most case. The time constraint, the emergence of new technologies, the changing aspect of the customers lifestyle are those elements that companies must take care of for keeping the web-application on Date.

In different company we got chance to visit, we come to know about recurrent problems ; and this article intend to share details about problems, and spread our thought about

what are the source of problems rise and the where it's come from and finally reveal how we can address these problems to solve them all. The coming paragraphs will give details about Web development common issues, scrutinizing steps going from planning phase to deployment and revealing problems we come across and roll out possible running solution.

A. Web Development Workflow

Web Development business is an ocean of diversities. When ask to some CEO what exactly their products are or what services their offer, we got an answer that is not exactly what they delivered. This situation is reflect at the company when time come to take decision to adopt a technologies, pay for tools or hire a new technical employee. The problem here is that , there is not a good definition of the core of services and the clear vision of product that will be deliver but also the web era is an immense world where novel ideas come as easy as they disappear, New techniques and tools are being introduced everyday. The web development industry is rarely in a state of equilibrium — everything is changing all the time.

To handle this problem, we request some company to write down what specially they are going to offer, how they are going to make it and when it will be deliver. Unfortunately, some company did not have a reel workflow that will help them reach customer requirements and objectives in the most efficient manner.

At one company, it was a great idea, to call together some team leader; domain expert and developer to sit down and to come up after their discussion, with a standardized and specialized development workflow that will be use depending of the services and product to be delivered.

The survey we conduct during our quest of agile development in web company [2], shown that only 41% of respondent think that there have a good development process running in their company.

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Do you have a well development process ?

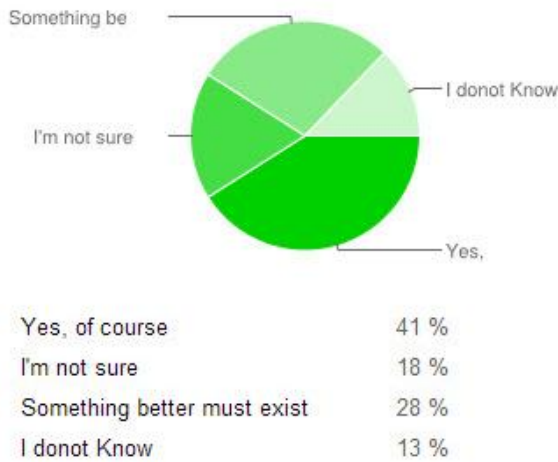|	
Yes, of course	41 %
I'm not sure	18 %
Something better must exist	28 %
I donot Know	13 %

Figure 1. Teams Perception of their Development Process

Most software projects fail. Especially in web development, we come to know that project fail not because of the team (even when businessman think that they are in cause,) or because of the customer (the ancient said the customer is always right) but because the process, the way teams and customer are going to produce the product/service is wrong. The truth is that, we are looking to deal with change as People don't really know exactly what they want until they try it and their needs and desires constantly instable. Having a process is related to the maturity of companies [20]. In company where there is not a so clear defined process, the success of the project is often determined by the expertise of the development team [21]

In fact, the Standish group reports that over 80% of projects are unsuccessful either because they are over budget, late, missing function, or a combination. Moreover, 30% of software projects are so poorly executed that they are canceled before completion. In the book Best practice for software development project, authors said that software projects using modern technologies such as Java, J2EE, XML, and Web Services are no exception to this rule.

Organizations can recognize significant schedule and cost savings by making early decisions about what will and will not be delivered by a project or program [3].

Agile seems to be the right answer for us; The field of agile software development addresses exactly the challenges of an unpredictable, turbulent business and technology environment [4], but Unfortunately today there is a lot of confusion around what it is and how it should be used,

because it became an industry buzz-word as we find it in many company survey. The core ideas of 'Agile' are still somewhat misunderstood and overlooked in many larger organizations that declare themselves as having adopted "agile" engineering principles.

B. Dealing with Client

Numerous studies have attributed high failure rates of software projects to lack of involvement by the business people commissioning it [5]. Many times we get e-mail from customers like that one:

"I want a website like -this- and –this- and so ... , Please add -this- and -that- and make the best possible have it working in less than 2 weeks ! Is that possible?"

This kind of interaction with client, who is sometimes asking much thing that expecting in the first meeting and who comes to be not happy at the end of the process, is an issue in much company we survey. We saw company struggle dealing with client and we were surprise to know that there is not a workable structure in their process. Even when they have documents to work through the requirement analysis to design step; these documents are not well write and there is many missing point that create confusion and a mess in both part: the customer and the development team. Most of the time, the problems come from the design implementation and the technical process specification. In fact, in our survey conducted, dealing with customer was among the recurrent answer when ask the reason why project run over time.

In one company we ask the development team to start using tools that are easy to use to deals with design specification and website functionalities such as wire-framing tools and collaboration tools. We saw this idea improve the work of the teams and also provide peaceful environment to work with the customer.

We add an another layer called 'barrier line' in the organization chart of one another company, whose had big portfolio of customer. The idea was to allow a Middleman position, which consists to stand between development team and client so that the team and the client take only few times to know what to add or remove in a current project. In another company instead of adding this new layer, we just impute this responsibility to the teams leaders, whose intervene only in critical issue, as the company prefer to have developer deals directly with the client as web development need to be responsive, It needs to add or remove more feature than planned, and often these action to not need a team meeting as it is not really impact the project.

Dealing with client is living in the agile revolution. The agile revolution will usher in a time when the total costs and

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benefits associated with change are finally focused upon [6]. In the production area, as in the rest of the enterprise, agile systems must vastly improve the ability to enact continuous daily improvements as well as major changes in system and configuration.

Being agile is not being obsesses about scrum meetings, velocity calculations, planning poker, or any of those process artifacts. It is about putting the ego aside and collaborating directly with the customers, help them discover what they exactly want and make it happen. And what customers want is not well defined in the requirement definition, so it must be revisit whenever it is required.

C. Building and Working as Team

While the programmer may know all the tricks and hidden features of a language, he or she will encounter difficulties in team development, maintenance, and larger development projects [7].

It's was a great surprise to see in some company, only one guy handle a web project from the beginning till the end. Even if the guy as many skills and even the requirement was easy, it seems to not be great ideas to occult the power of working in teams in favors of reducing project/resources factors. Teams that work in a spirit of active cooperation and commitment will always outperform groups of individuals working only in loose association [8].

Figure 2. Image of Software Development office

We found in our survey [17] and many work like the one of Hansen and Yogesh [18] that the working team in web

development is relatively young. This fact can be an advantage to propulse innovation and a disadvantage to provide solid and experienced product/services. Web-based application developers all seem to be young, full of energy, conversant with new technologies and enjoying themselves in contrast with those in charge of corporate applications and systems, which are old, tired, and weighed down by legacy systems.

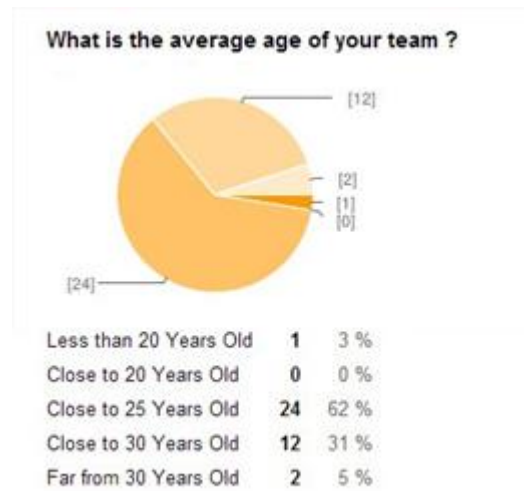| What is the average age of your team ?		
Less than 20 Years Old	1	3 %
Close to 20 Years Old	0	0 %
Close to 25 Years Old	24	62 %
Close to 30 Years Old	12	31 %
Far from 30 Years Old	2	5 %

Figure 3. Web-Based Development Team Age.

Development of a Web application requires a team of people with diverse skills and backgrounds (Hansen, 2004)

Building a website is not like earlier , where just one guy sit in a small area like a bedroom, working alone in front of his computer and a was called 'Webmaster'. Website was once a rudimentary system for distributing static content consisting of simple text and images; it has become a platform for highly sophisticated, distributed, enterprise-level applications. Development of a Web application requires a team of people with diverse skills and backgrounds (Hansen, 2004)

Thing are changing today building an efficient website rely on a web team which consist of content writers, marketing, graphic designer, frontend coders, back end coders, DBAs, sys Admins, tester, ... to cite only few among a bunch of responsibilities. Today, working for Web applications Development Company suggests that you must understand not only HTML, but the other used web technologies as well. You must be familiar with JavaScript, XML, relational databases, graphic design and multimedia,

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application server technology, and have a strong background in information architecture and configure the e-commerce transactions.

Is that possible to find such a Web application superhero/guru/demigod? If yes, please let us know—we would love to hire them!

Team is really important when it comes to produce software, and scrum, one of the primary agile practices relies on it. Scrum uses small, self-organizing teams that coordinate their work in a daily stand-up meeting to produce increment deliverable software using sprints. (XP) eXtreme Programming, a well use agile method also provides a team collaboration technique called Pair Programming: Project members programming tasks by pairs. This technique provide lot of advantages [9] like: unifying programming style to provide high quality codes, smooth knowledge transfer, efficient learning, and teamwork upgrading.

D. Know how much it cost

Everybody wants to know what it's going to cost: about money, time and resources. The business owner and the customer are not looking only to deal with the final product but also about the cost. One day in a company surveyed, at delivery meeting, we were taking more time arguing, when the teams manager suggest that the project must cost more than the price conclude by the marketing team. To justify what he was saying the team manager said: *" we couldn't tell what any given project would exactly cost, as we do not know exactly what to build, or how much detail work would be necessary before declaring victory and calling the project complete."*
This issue was complex to solve, finally the meeting agrees that the solution is to provide a reasonable budget up front, which prioritize features, and make sure the critical ones are done first before the budget is exhausted. Accurate cost estimates are an essential element for providing competitive bids and remaining successful in the market [10]. Over- and underestimates of the expected costs have a significant influence on a company's reputation and competitiveness.

Most WWW developers delve directly into the implementation phase, paying little or no attention to requirements acquisition and specification and going through a very informal design phase as it is shown in Towards a Software Engineering Approach to Web Site Development by coda,ghezzi,vigna & Franca garzotto. During our investigation, we do observe some developers rushing directly in writing code, just after reading a

customer requirement that for our eyes was judge as vague and confuse. The team leader and the developer reply: *"It will be the same product to deliver at the end, as we already deals with such products".*
The result was a disaster when it's come to deliver the product, were they have to clear doubt and justify the way they have gone throw the realization. It take them a month to come to an agreement with the customer about the final product and lot of struggle on reworking the project fully by a -special development team- that find difficult to work with the ex-code as developers had not follow the coding outline. This situation, that come often, as underline by the marketing team allow us to learn two lessons:
- Work closely with customers on defining an overall project outline, know all your project's specifications, its target platform(s), its users, and never underestimate the significance of planning.
- The less effort you spend on consistency and maintainability, the sooner you'll run into problems when reopening old files and trying to fix bugs or add new features.

For every project, providing a plan which incorporates the details of cost is a clue to success. Give correct answer to question such as ; how many people it will require, how long it will take , how much will it cost to us, ect guaranties the success of any kinds of project and especially in web application development.

E. Having the right tools and technologies

Web pages today are not anymore as simple it was earlier. Web site and application are not simple document to read or a flat linked forms page to be filled. Web page today are more complex, it have a frontend also known as client side technologies that allow a more elaborate direct and fast interaction between user and the browser, not to forget all the improvement done at the server side technologies with easy database communication and web services provisions, etc.

Creating a web application, as to deals with using an appropriate tools and the correct technologies. Tools and technologies use at the production level are very crucial and affect the quality of the work and the product/service to deliver. Web technologies [16] is define as a set of languages, protocols and tools that allow us to create Web applications- is changing very fast.

As simple as a webpage is a successive line of code interpreted by the browser and run by server; it is not anymore easy as it seems to use a simple editor to write that

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code. At scanned company where we were got the doors graciously opened, it was not encouraging to see some development teams working in a minimum an restricted work environment. Lacks of powerful computer for graphics designer, the so called open source tools politics that hide the fact that company are not ready to invest in paying efficient software because it is proprietary one. in many company , it was also painful to see teams not really working together into project, because they lacks of having collaboration tools installed to track code change and to allow communication among them in different project they are working in. Study [11] found that collaboration and team based tools was not much study as IDEs, this is may be the reason why collaboration tools are not well integrated in development workspace. Team's collaboration technique is a crucial feature of project management. We had recommended in many companies the intensive use by their development team of software project management tools because these tools are important [12].

Like team collaboration strategies, debugging technique and testing feature are some technique that cannot be forget for every project developed. In some company, we report the lacks of these kinds of tools; so we encourage and initiate the production of a written document that:
- Explain the need of teams from the minimum to the high satisfaction level,
- Provide the comparative analysis of tools available in terms of price, functionalities and impact to the quality and speed to delivery possible.

The result was incredible in one company where, all teams leaders come to discuss about the tools used compared to what are available, give their feedback to the managers that agree to pay for some tools and even improve the development workspace.
In fact, at few companies, we must deal with the team's excitement and donot permit them to ask for grandiose software frameworks in anticipation of feature requests that never came, and features that are not needed for the kind of business they work in.

Having tools that is "just right" is all it takes to improve the quality of service/product to deliver. Even when at this stage we concentrate our effort about development tools, it will be a great income to incorporate tools that are find most effective to support team communication and collaboration, project planning and much more. Today, teams recognize the growing need of specialized tools; these tools are needed to drive improvements throughout the application lifecycle.

The technologies territory is more complex. It has many domains and areas to visit like server and browser technologies, language technologies, web framework, etc. It comes that all technologies can be resume under the kind of vendors that support and provide them. About technologies vendors, for web system, (3) three main groups emerged: Java™-based J2EE, Microsoft .Net and Open source vendor like Apache foundation and other private vendor like Adobe Macromedia.

Once an application is developed using one technology, it is difficult and expensive to convert it to a different one. As a result, many web application developers have a strong interest in promoting the technology they are familiar with.

The following table summarizes the three main technology stacks with the following attributes:

• Programming languages (Lang)
• Operating system (OS). This can be Linux (L), Unix (U) or Windows (W).
• Web server (Server)
• Database support (DB)
• Sponsoring companies (Sponsors)

Stack	Sponsor	OS	server	DB	Lang
Java/J2EE	Sun/IBM	L,U	Tomcat	Oracles, DB2, varies	Java, JSP
.Net	Microsoft	W	IIS	SQL Server, varies	Visual Basic, C#
	Open Source	L, U, W	Apache	MySQL, varies	PHP, Ruby, Python

Table 2. Available Web Technologies

During our investigation we come to know that technologies vendors offer same kind of technologies and if not available they provide good alternative to that opposed solution. The problem often encounter when it comes to technology choice, was that often customer prefer a special technology because it has been proved that a concurrent use the same or because of intensive ads distraction; in the other hand, company seems to have more skills and competence in specific-one or development teams prefer to work with a technology they were familiar with instead to use the right one.

Web Application Development (WAD) is getting rid of heavy programming labor and replacing it with resource aggregation to reuse available services on the Internet. Building a web application consist today of choosing the

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right library available, select a good framework and web services available instead of writing a lot of programming code. Nowadays, most Web applications are content-driven (database-driven) that includes creation and management of the contents. It creates the boom of (CMS-Website) Content Management System with the major that are Joomla, WordPress and Drupal to cite the often known.

CMS include a template engine for the feel and look or the website; provide a management of website users (from visitor to authors and administrator). The management of media allow administrator to administrate the information to interact with.

Web development and traditional software development had many differences. These differences comprise the software development methods and technologies, as well as the development team and the project conditions. Usually high time pressure and very volatile software requirements play a central role in a web development project.

To solve the issue encounter when it comes to technologies and tools to be used, Our first idea was to suggest a well return list of kind of product the company can deliver, with the competency available regarding the time and cost factor. This document can after be well use to assign project to different team. The technologies to use must not be guide by the ideas to save or make more profit on web business because every time, reworking on a delivered product and others services like maintenance and resolving security bridge adds more cost that can be avoid when use the appropriate tools and technologies combine efficiently with the teams working in the well managed environment.

Final Quote and Acknowledgements

Today, the survival of major corporations is challenged by a world-wide marketplace. Enterprises must constantly adapt and built a web visibility with respect to customer expectations. It turns out that the traditional "waterfall" model is not supportive in an environment where customers' requirements constraints are changing almost every day. In practice, therefore, it is almost always impractical to implement the requirements process as a linear, deterministic process in which software requirements are elicited from the stakeholders, baselined, allocated, and handed over to the software development team [15].
A survey on Web-based projects, published by the Cutter Consortium in 2000, revealed a number of problems with outsourced large Web-based projects [Ginige A (2002) Workshop on web engineering: Web engineering: managing the complexity of Web systems development. In: Proceedings of the 14th International Conference on Software Engineering and Knowledge Engineering, July, pp 72−729] :
• 84% of surveyed delivered projects did not meet business needs.
• 53% of surveyed delivered projects did not provide the required functionality.
• 79% of surveyed projects presented schedule delays.
• 63% of surveyed projects exceeded their budget.

What is the one thing that can truly enable individuals and teams to collaborate and innovate? Agile is the answer!

Web software development is characterized by complexity and the ability to bring such projects to a successful completion is to Rethinking Web Software Development. Agile development seems to work fine for a web-kind of project were teams have to deals with runaway projects, late delivery, exceeded budgets, reduced functionality and questionable quality. Using Agile methods in the right way bring far greater innovation, value, and quality to any software application project. Agile process models emphasize project "agility" and follow a set of principles that lead to a more informal (but, proponents argue, no less effective) approach to software process. These process models are generally characterized as "agile" because they emphasize maneuverability and adaptability. They are appropriate for many types of projects and are particularly useful when Web applications are engineered [19]. However, conventional agile methods must be carefully adapted to address the unique characteristics of web-product projects. Technology companies claim that you need the latest and greatest tools while consultants say you need a rigid process of best practices. The tools and practices have a profound effect on the day-to-day life of a developer. These types of practices and tools have either helped development teams deliver software. But Researchers and academicians argue that these things will make a difference but they are useless without a culture that promotes the right principles.

The intended of this paper is to publish the solutions, as a series of recommendation, we find when it comes to deal with the problem we find on the company surveyed. We expect that the given solutions will provide the same successful result to solve same issues in development of web-based software and will be taken for granted in future research. Meanwhile, our current work which will lead to a final academic dissertation will bring later the proposed designed framework that can be used when developing a

web based product with an agile approach that will integrate practices, techniques, principle of the most know agile methods considered their largest implementation attempted anywhere in the world : XP, SCRUM, LEAN. Using Scrum as a pedestal for the organizational aspect of software management, Lean strength basically will be used for the re-engineering process of project analysis and XP as a foundation of de development activities.

Expecting so, we would like to thank the companies, referred to in this paper anonymously, without which this piece of research would not have been possible. We would also like to thank the many employees within these companies for their cooperation and support.

Acknowledgments

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