Usability Evaluation as a Component of the OPEN Development Framework

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Abstract

Considerable work has been done in the area of formative usability evaluation of websites, and usability is now an accepted part of the development process. However, a significant portion of the literature on usability does not examine the broader aspects of the product as it evolves and focuses instead on user interactions. In practice, usability often overlooks the underlying architecture and the business model in developing the design of a website and has a clear focus on interface design. In this paper we report on a collaborative research project that examines the role of usability evaluation within a broader development framework – a process model called the Object Oriented Process Environment and Notation (OPEN), and in particular its application in Web OPEN. The paper considers practical methods for the integration of usability evaluation into the framework through a case study of a practicing usability group at Access Testing Centre in Sydney, Australia. This research showed that Web OPEN, with some extensions, is an appropriate framework to describe and support usability activities within current Web development practices. This work serves three purposes: It validates the Web OPEN process model against current industry practice; it identifies areas of the process model that require refinement to describe usability activities in web development; and it places our activities as Human Computer Interaction (HCI) practitioners in the broader context of a Web development framework.

1 Introduction

Website development is in a state of rapid change and rapid prototyping tools and shortened timeframes have contributed its relative immaturity compared to traditional software development. In response, much work has been undertaken to introduce more formal methods for developing websites. One such framework is that of Web OPEN. Web OPEN is an extension of the Object-oriented Process Environment and Notation designed to provide guidance for website development projects. As the Web OPEN process framework is only relatively new, the goal of this project was to further develop and detail the framework in the area of website testing and evaluation, with an emphasis on the role that usability testing and HCI plays in the development process. A part of developing and detailing this framework has been to undertake a case study with Access Testing Centre (ATC), a leading Australian website testing company that conducts usability evaluation and consultancy. This paper provides an overview of our research and details initial findings.
2 Overview of the OPEN framework

OPEN is a third generation Object Oriented development framework, which in recent years has been enhanced to account for the unique nature of Web development. As OPEN is in the form of a process framework rather than a fixed development methodology, it readily allows for feedback and changes to the development process as tools and techniques are further refined, or as components of the development processes are improved and approaches mature.

In the OPEN Process specification (Graham, Henderson-Sellers & Younessi 1997), the OPEN process model, and consequently Web OPEN from which it is derived, have the following essential elements:

- **Producers** – people in the process model who perform work units, which leads the production of work products.
- **Work Units** – the elements of work that are used to produce a work product.
- **Activities** – major work units made up of a series of related work products. Activities are in turn accomplished using a combination of various tasks (individual elements to be completed in accomplishing an activity) and techniques (the methods used to complete both tasks and activities).
- **Work Products** – the tangible outputs of the work units.

Additional elements of the framework come in the form of:

- **Stages** – used to provide higher-level organisation of the various work units and work products by grouping them together.
- **Languages** – used to document work products. They can take many forms such as modelling languages, implementation (programming) languages or natural languages, such as English.

Web OPEN is a theoretical framework that does not explicitly account for HCI activities. Our research was based on a desire to benchmark the framework with industry practice, and identify areas that require enhancement to account for the application of HCI services.

3 HCI practice and business needs

In completing this research project, many observations were made about the current status of both website development as well as website evaluation. One particular area of note in the testing process is that of acceptance criteria and the requirements from which they are derived. In developing requirements which detail the client’s needs, as well as the purpose and scope of the website, the development team is then able to work with a customer in selecting metrics and target values in order to enable the client and the development team to negotiate acceptance levels for the website. While requirements are an important part of evaluation they also help to define the direction of the project at the initial stages, as well as providing a measure of project success.

In defining these requirements, some important questions need to be answered, such as who the users are and what are their tasks, how will they use the system and how do these requirements fit in with the needs and objectives of the business that wishes to have the site developed. Problems that can result from not having properly defined these requirements include websites that are unsuitable for their intended function, un-maintainable, and cost more due to the need for multiple fixes if the scope and the requirements begin to creep.
Another aspect of web evaluation that is not as frequently considered in HCI work is the business case or business needs of a website. In other words, ensuring the website meets business goals and user acceptance levels. Ensuring users see the value of a website is more important than its usability. This has important implications for HCI practice, where market acceptance of a design precedes usability. E-commerce is relatively new and there is also a limited amount of experience to guide people in building websites that work to fit a set of business needs. While some ideas for websites may provide value only to the business, others may provide value only to the customer. It is this area where these two sets of goals interact that provides the true benefits of having a website.

In addition to providing value to both the customer and the business simultaneously, there may be other intangible aspects or values to a particular business which might drive them towards developing a website, such as status, or a desire to stay ahead of competitors. The goal of many websites may be simply usage goals, expressed in user sessions. Real meaning can only come from these goals when they are targeted and specified appropriately, which can be difficult to achieve as clients frequently do not understand their needs, or the way that technology can assist them. To make matters more complex, it is often difficult to derive requirements arising from different professions and practices within a business, as each will often have their own different priorities and language used to express those needs and priorities.

4 Commercial practice

Based on the results of the case study at Access Testing Centre, it was clear that many organisations frequently failed to understand their needs from a business perspective, and thus how technology could help them meet their business goals. This meant that the end of a project, user acceptance levels were low; hence the usability of the site was of less consequence. This is echoed by the experiences of some of ATC’s staff members during the “Dot Com” boom. During this period, it was found that many companies had very unusual ideas for websites or web applications which were fundamentally unsound, as studies revealed that virtually no-one had a need for the product that a company had devised, and that even if there was a demand for the particular product, the site that was developed to meet this perceived need was very difficult to use. As a result, users would often stay away, and the results would be disastrous for the organisation backing the website.

More recently there has been a shift in that customers now may have a goals defined, but at the same time there is still a lack of understanding on how to best design the website to achieve these goals. This means that the initial definition of requirements can still be quite difficult. These problems vary greatly as some organisations are able to articulate business goals very clearly, and understand how the web can help them achieve their goals.

Another observation was the nature of usability testing as a part of the development process. Presently, many clients appear to come to ATC in a state of crisis, thus resulting in ATC’s services being used to “fight fires” in a reactive way, dealing with problems on a last minute basis just prior to launch. Customers in these circumstances may frequently approach the organisation with a view to fixing problems that they believe could exist with their website or that they know exist but don’t know how to fix. However, they most likely will not have conducted a large amount of testing during the development process, instead preferring to leave the majority of testing until the last stage of development.
Looking forward, ATC is working with its clients to change this attitude, to a model where testing is done at different points during development, at different project milestones during the course of the project. This change is being facilitated by educating clients about the benefits of iterative testing, through activities such as quality advocacy. The benefit of this new approach to testing is that in can provide a much more value added and effective way to conduct testing for ATC’s clients, as performing activities such as last minute system or usability testing makes it difficult to add a large amount of value to the client’s business. Having said this, some organisations already adopt this more proactive approach, as a means of good software development practice.

Another means of facilitating the changes mentioned above is by ATC moving away from working project by project with developers, and moving more towards a model of partnering with the business. In this case ATC is their “Quality partner”. This means that ATC can get involved in the project earlier with a view to defining acceptance criteria, and helping to ensure that these criteria are met through iterative evaluation. An added benefit of this approach is that a higher level of impartiality can be achieved between ATC and its clients.

5 Relationship to OPEN

In undertaking this work on the Web OPEN framework, several interesting observations were made in relation to the process framework, as well as website testing and evaluation. With respect to Web OPEN in the broader sense, the main observation made was that it appears that the process framework is still largely relevant and reflective of current industry practice in general terms. Although the Web OPEN framework was not specifically evaluated in the broader development context, evidence obtained during the case study suggests that the framework is still very useful in for website development.

Website development and specifically website testing and evaluation, are still rapidly developing areas technologically. At the same time however the level of maturity with respect to testing and evaluation can vary widely. This was further reinforced by the case study, which found a large number of Access Testing Centre’s clients still undertaking a large single stage of testing just before release in order to identify and correct any problems. Fortunately there appears to be a trend away from this model, to one that encompasses a more continuous stream of testing throughout the development process, albeit on a smaller scale at any one given time. This should help to ensure that testing and evaluation efforts continue to become more effective in terms of the feedback into the development process and the mitigation of potential problems within the finished product.

In terms of the manner in which testing is conducted, it is also interesting to note how new technologies are being employed to further enhance and refine existing testing and evaluation techniques. Further to this, the reuse of some existing software engineering techniques with regards to website testing and evaluation were also observed – hence the inclusion of some additional OPEN tasks and techniques into Web OPEN to help reflect this trend. Thus while website development is still a relatively new field within the context of software development, overall there appears to be a move towards the use of more formal methods and a more mature attitude towards website testing and evaluation.
6 Conclusions and further research

While much work has been done on website development in previous years, much still remains to be done to ensure that website development reaches a level similar to that of traditional software development. That the available tools and methods allow websites to be rapidly developed with throwaway prototypes does not mean that a process framework for web development is not required. Our research has shown that Web OPEN is an appropriate model that conforms to current practice in web development and iterative evaluation. It has however highlighted the need for Web OPEN to be extended to further consider business needs. As OPEN includes support for business re-engineering and modelling, this is one area which could be investigated and developed further within the area of Web OPEN, with a view to clarifying many of the questions that appear to be unanswered with respect to business needs and HCI practice.

Looking to the future, it appears that usability testing is beginning to become more commoditised, due to the increasing prevalence of literature on the topic and a better understanding of its value to economic decision makers. As a result, there appears to be a shift towards ensuring quality and maturity of process websites during development rather than just the quality of the end product. In other words, organisations can often gain large benefits out of improving their processes, which in turn will help to ensure product improvement including the usability of their website.

7 References


