

SOFTWARE METRICS

BTH, SWEDEN

PRODUCT NAME: Abe books

<http://www.abebbooks.com/>

Usability measurement proposal

From users point of view

Outline By:

Kartheek Chilla-9304163778

Meghana Medisetti-930103P168

Samhith Manda-9402066915

Maniteja chodapaneedi-931207332

TABLE OF CONTENTS

CHANGE LOG	3
1. INTRODUCTION.....	4
1.1 PURPOSE.....	4
1.2 PRODUCT.....	4
1.3 OVERVIEW	4
2. MEASUREMENY GOAL.....	5
3. GOAL QUESTION METRICS (GQM).....	5
3.1 GQM TABLE.....	5
3.2 GQM TREE.....	8
4. ENTITIES, ATTRIBUTES AND MATRICS.....	9
5. QUESTIONNAIRE	16
6. PROPOSED EMPIRICAL STUDY	19
6.1. TO-DO TASKS FOR FORMAL EXPERIMENTS.....	19
6.2. TARGETED AUDIENCE QUESTIONNAIRE.....	20
7 REFERENCES.....	

Revision history

Version	Date of changed	Changed by	Summary of change	Page changed
0.1	2015-4-29	Kartheek, meghana, maniteja and Samhith	Initial Drafting	Complete
1.0	2015-5-07	Kartheek, meghana, maniteja and Samhith	Identify and document entity	8 AND ABOVE
1.2	2015-5-13	Kartheek, meghana, maniteja and Samhith	Identify and document attributes and metrics	4 AND ABOVE 10

Introduction

A website is one or more webpage that relate to a common theme, such as person, business or organization. Web usability In recent trends usage of website became very common to do daily tasks in life, ecommerce website is nothing but importance of clarity, simplicity and consistency's to design web pages, so that the user can perform work and desired operations "efficiently & effectively", e-governance websites, social networking, web portals, online ticket booking etc. Are very common things individuals perform? This resulted in creating websites which is of more interactive and more dynamic. Usability is one of the major factors that determines the successfulness of a website. In the following sections, many users have been discussed about the differences between beneficial and non beneficial sites websites.

Purpose

Using CMM level 4, Abe books always focus to considering deliver online e-services with best user experiences. To reach the level of provide g great user experience to all the customers who purchased the book's through are made easy to use. This report is been written and studied as an objective to help in attaining this objective. The area of interest of author in report is to propose a metric for measuring the usability of the Abe books web application from the user's point of view.

Product

Abe books is having a former name as advanced book exchange, it is a venue for the customers who wants to purchase books through online. The books in this web site are listed in three categories they are used, rare and out of print. This company has launched its websites in 1996 Abe books offers six resigned websites North America, French, Germany, Italy, UK and Spain. Abe books users can search the books they will be provided with listings of many independent book stores. There are two facilities available in this website, one can buy books through online and while others also maintain a regular store front.

Usability

User is provided with advanced search, browser, rare books and textbooks. As soon as the user open the application he will have a menu bar with options, author, title, keyboard, ISBN of the book user is searching for more over user is provided with individual user account with an option of "MY ACCOUNT", so that user can keep track of purchases and get the updates of new book available on the web site, there is a book available on the web site, there is a basket option. We can view titles of books that were selected by the user and about to go for the payment

Overview

Following is a brief description and reminder of this document:

Section 1: it provides the context, purpose and overall description of document.

Section 2: this section provides the measurement goal for which the product would be examined

Section 3: this section specifies methodology, questions and metrics to be considered for achieving goals identified in section 2

Section 4: it presents entities, attribute types, metrics and scale type.

Section 5: in this section, questionnaires is presented followed by suggested empirical study method

2. Measurement goals

Following table describes the measurement goals of produce

purpose	perspective	Environment and constrains
To evaluate Abe books to assess the usability of the web application	To assess the usability customer's(users) effectiveness, effectiveness, efficiency, learn liability, user satisfaction, accessibility, user experience, navigation, attractiveness, completeness	Global users are like adults, students, book lovers, poets, technocrats and so on.....

3. Goal-Question-Metric (GQM)

3.1. GQM Table

Serial	Goal	questions	metrics
G1	simplicity	Is it easy for the users to search and operate?	Satisfaction when operating through webpages for required books.
		Does all the pages in the web site are available to the user?	Satisfaction with unlimited access to the pages for the required books.
		Does the close captions provide the necessary output?	Satisfaction with close caption as output method.
		Does the user believe in fear of missing something in the web site?	Satisfaction with the availability of information that is required.
		How effective is the web site in loading the pages?	Satisfaction with loading time.
G2	Navigation	Does the search navigates to the desired result?	Gratified with the desired search result.

		Does the links work efficiently?	Gratified with the navigation.
		Is it difficult to navigate between the links and the home page?	Easiness to navigate from current page to home page.
		Does the link states where it is navigated to?	Relief with the navigated output of the link.
		Is the user given a variety of navigation options?	Availability of number of link options.
G3	Reliability	Is there any presence of errors?	Less number of errors.
		Is the specified book in the web site is correct?	Incorrect author spelling but relevant books.
		Does the content in the link match to the specified book?	Satisfied with the reliable content accessed with the link.
G4	Usefulness	Is the web site really useful in searching the required book?	Satisfied with the usability of search options to get required book.
		Does the user get adjusted with the changes made to the web site design?	Level of acceptance to get adjusted.
		Is the web site usable for different type of users?	Available to different types of users.
G5	Supportability	Does the web page provides various contact methods?	Availability of email contact method.
		Is the user satisfied with the contact methods?	Satisfied with the provided contact method.
		Does FAQ's provide necessary solution to the user?	FAQ's support in resolving the queries.
		How long user needs to wait for reply in case of contact?	Time taken for the reply.
G6	Attractiveness	Is the web page attractive to the users?	Satisfied with the appearance of the web site.
		What is the experience of the user on using the web site?	Level of enjoyment.
		Is the color used in the web site are attractive?	Satisfied with the colors used.
G7	Efficiency	How much time does it take to search?	Lesser search time.
		How much time does it take to load a book?	Lesser loading time.

		How much time does it take to navigate between the links?	Number of broken links are less.
		Does the web site works at any instant of time?	Satisfied with the performance.
G8	completeness	How often does the web page get revised?	Satisfied with the revision.
		How effectively is the user satisfied with the web site?	Level of completeness.
		Is the close caption available in the search string?	Inconsistence in providing close caption.
G9	Safety	Does the web site has the safest payment procedure?	Feeling secured with the payment procedure.
		Is the web site secure to use?	Safety while using web site.
		Is the user information secured?	Secured user information.
G10	compatibility	Does the web site works on various electronic devices like ipad, phones and tablets?	Satisfied with different devices.
		Does the web site works on different web browsers?	satisfied

3.2 GQM TREE

goals
Simplicity
Navigation
Reliability
usefulness
Supportability
Attractiveness
Efficiency
Completeness
Safety
compatibility

questions
Is it easy for the users to search and operate?
Does all the pages in the web site are available to the user?
Does the close captions provide the necessary output?
Does the user believe in fear of missing something in the web site?
How effective is the web site in loading the pages?
Does the search navigates to the desired result?
Does the link works efficiently?
Is it difficult to navigate between links and home page?
Does the link states where it is navigated to?
Is the user given a variety of navigation options?
Is there any presence of errors?
Is the specified book in the web site is correct?
Does the content in the link match to specified book?
Is the web site really useful in searching required book?
Does the user accepts the changes made to the web site?
Is the web site useful for all types of users?
Does the web page provides the contact address?
Is the user satisfied with the contact methods?
Does FAQ’s provide necessary solution to the user?
Is the web page attractive to the user?
What is the experience of the user on using the web site?
Are the colors used in the web site are attractive?
How much tome does it take to search?
How much time does it take to load a book?
How much time does it take to navigate between links?
Does the web site works at given any instant of time?
How often the web page gets revised?
How effectively Is the user satisfied with the web site?
Is the close caption available in the search strings?
Does the web site has safest payment procedures?
Is the web site secure to use?
Is the user information secured?
Does the web site works on various electronic devices like ipad, mobiles, tablets
Does the web site works on different web browsers?

metrics
Satisfaction when operating through webpages for required books.
Satisfaction with unlimited access to the pages for the required books.
Satisfaction with unlimited access to the pages for the required books.
Satisfaction with the availability of information that is required.
Satisfaction with loading time.
Gratified with the desired search result.
Gratified with the navigation.
Easiness to navigate from current page to home page.
Relief with the navigated output of the link.
Availability of number of link options.
Less number of errors.
Incorrect author spelling but relevant books.
Satisfied with the reliable content accessed with the link.
Satisfied with the usability of search options to get required book.
Level of acceptance to get adjusted.
Available to different types of users.
Availability of email contact method.
Satisfied with the provided contact method.
FAQ’s support in resolving the queries.
Satisfied with the appearance of the web site.
Level of enjoyment.
Satisfied with the colors used.
Lesser search time.
Lesser loading time.
Number of broken links are less.
Satisfied with the performance.
Satisfied with the revision.
Level of completeness.
Inconsistence in providing close caption.
Feeling secured with the payment procedure.
Safety while using web site.
Secured user information.
Satisfied with different devices.

Assignment 2- Part II
Software Metrics (PA 1407)

serial	goals	questions	entities	attributes		metrics	Scale type	Scale point
				internal	external			
G1	simplicity	Is it easy for the users to operate?	Input (process)		Easiness	Satisfaction when operating through webpages for required books.	Ordinal	Very Easy, Easy, Neutral, Hard, Very hard.
		Does all the pages in the web page are helpful and available to the user?	Input (process)		Helpfulness	Satisfaction with unlimited access to the pages for the required books.	Ordinal	Very Helpful, Helpful, Neutral, Not Helpful.
		Does the close captions provide the necessary output?	Input (process)		Easiness	Satisfaction with close caption as output method.	Ordinal	Very Easy, Easy, Neutral, Hard, Very hard.
		Does the user believe in fear of missing something in the web site?	Output (process)		Usefulness	Satisfaction with the availability of information that is required.	Ordinal	
		How helpful is the web site in loading the pages?	input (process)		Helpfulness	Satisfaction with loading time.	Ordinal	Very Helpful, Helpful, Neutral, Not Helpful.
G2	navigation	Does the search navigates to the desired result?	Searching process		Ordinal	Gratified with the desired search result.		Very Easy, Easy, Neutral, Hard, Very hard.
		Does the links work efficiently?	Testing procedure	No broken links		Gratified with the navigation.	Absolute	Number
		Is it difficult to navigate between the links and the home page?	Navigation		Easiness	Easiness to navigate from current page to home page.	Ordinal	Very Easy, Easy, Neutral, Hard, Very hard.
		Does the link states where it is navigated to?	Navigation		Remember it	Relief with the navigated output of the link.	Nominal	Yes OR No
		Is the user given a variety of navigation options?	Navigation		Learnability	Availability of number of link options.	Nominal	Yes OR No
G3	reliability	Is there any presence of errors?	Errors	Density of errors	Tracability	Less number of errors.	Absolute	

		Is the specified book in the web site is correct?	Reliability	Trust	Correctness	Incorrect author spelling but relevant books.	Absolute	
		Does the content in the link match to the specified book?	Testing		Learning process	Satisfied with the reliable content accessed with the link.	Nominal	Yes OR No
G4	usefulness	Is the web site really useful in searching the required book?	Usefulness		Easiness	Satisfied with the usability of search options to get required book.	Ordinal	Very Easy, Easy, Neutral, Hard, Very hard.
		Does the user accepts the changes made to the web site?	Usability		Learnability	Level of acceptance to get adjusted.	Nominal	Yes Or No
		Is the web site usable for all types of users?	Usefulness		Satisfaction	Available to different types of users.	Ordinal	Very satisfied, Satisfied, Neutral, Dissatisfied, very dissatisfied
G5	supportability	Does the web page provides the contact address?	Functionality/ Usability	Availability		Availability of email contact method.	Nominal	Yes or No
		Is the user satisfied with the contact methods?	Usability		Satisfaction	Satisfied with the provided contact method.	Ordinal	Very satisfied, Satisfied, Neutral, Dissatisfied, very dissatisfied
		Does FAQ's provide necessary solution to the user?	Usability		Coverability	FAQ's support in resolving the queries.	Nominal	Yes OR No
		How long user needs to wait for the reply?	Supportable		Consistency in reply/Response time	Time taken for the reply.	Ordinal	Within a day, within 3 days, within a week, greater than a week, Never
G6	attractiveness	Is the web page attractive to the users?	Usability		Attractiveness	Satisfied with the appearance of the web site.	Nominal	Yes OR No
		What is the experience of the user on using the web site?			Satisfaction	Level of enjoyment.	Ordinal	Very satisfied, Satisfied, Neutral, Dissatisfied, very dissatisfied
		Is the color used in the web site are attractive?	Usability		Attractiveness	Satisfied with the colors used.	Nominal	Yes OR No
G7	efficiency	How much time does it	Efficiency/Time behavior		Response Time	Lesser search time.	Ordinal	<1 sec, < 10 sec,

		take to load a book?						<minute, > minute
		How much time does it take to navigate between the links?	Efficiency/Time behavior		Response Time	Lesser loading time.	Ordinal	<1 sec, < 10 sec, <minute, > minute
		Does the web site works at any instant of time?	Efficiency/Time behavior		Response Time	Number of broken links are less.	Ordinal	< 1 sec, < 10 sec, < minute, > minute
		How much time does it take to search?	Efficiency/Time behavior		Response Time	Satisfied with the performance.	Ordinal	< 1 sec, < 10 sec, < minute,
G8	completeness	How often does the web page get revised?	Functionality (Product)	Compliance with functional requirements		Satisfied with the revision.	Absolute	
		How effectively is the user satisfied with the web site?				Level of completeness.	Absolute	
		Is the close caption available in the search string?	Testing Process	Completeness		Inconsistence in providing close caption.	Nominal	Yes OR No
G9	safety	Does the web site has the safest payment procedure?	Design Process	Security		Feeling secured with the payment procedure.	Nominal	Yes or NO
		Is the web site secure to use?	Testing Process	Security		Safety while using web site.	Nominal	Yes or No
		Is the user information secured?	Testing Process	Security		Secured user information.	Nominal	Yes or No
G10	compatibility	Does the web site works on various electronic devices like ipad, phones and tablets?	usability		Compatability	Satisfied with different devices.	Nominal	Yes or No
		Does the web site works on different web browsers?	Usability		Portability	satisfied	Nominal	Yes or No

Assignment 2- Part III

Software Metrics (PA 1407)

I. QUESTIONNAIRE

To measure the usability of the website questionnaire is formulated. In order to design the questionnaire in a generalized way the set of standards or guidelines are taken from <http://www.abebooks.com/>. In order to understand which age group are visiting the book store the age is dependent as the store consists of all variety of books for different group of age. In our survey questionnaire, which we intend to use the same once that is used for the questionnaire. In our survey questionnaire, initially we asked questions like age, name and how frequent does they visit the website. The survey is posted in the book website itself. This reduces the scope of the total number of respondents to those who only visit the website. Alongside with the common general questions we also imbibed some questions that relate to the usability measurement of the website. The questions are presented below and the corresponding need for particular question.

S.No	QUESTIONS	PURPOSE OF THE QUESTION
1.	The average number of clicks that are required by the user to reach the required book from the home page.	We related this question to understand the navigation of the website. We framed this question in order to relate to the three clicks count metric.
2.	How much time does it usually taken to get the response for the posed query?	This question is important as it elaborates the usability of the website. The time take by the maintenance team to give the feedback for the posed question by the user has effect on the website usability measurement.
3.	On a scale of 1 -5 how easy is the website typography, language and book displayed is it understandable.(5-very easy, 4-easy,3-sufficient,2-satisfactory,1-difficult)	This help in understanding the readability of the website.
4.	If there are any changes that are necessarily made on the design part of the website for interest among users. Are these changes notified to the users.	The question is important to the adults as they can now see and understand the changes made to the website and the maintained by team can be given feedback if there is further still any improvement that are to be made.
5.	Do you think the current search option was better to obtain the required book that is intended was this search option really helpful. More over the buttons MY Account and Sign on are they understandable?	Certain users usually habituated to sign in and signup links to create and; login into the account. The traditional buttons. Even the search space given for Author, Title, and Keywords etc. was that way easy enough or still there is another way required from user perspective can be known.
6.	On a scale the design changes that are made on the website are they good enough?(5-excellent,4-very good,3-good,2-satisfactory,1-poor)	To understand whether the changes made on the website are understood and the users like The new look of the website.
7.	Can this website easily found on the search engine while typing the url while searching over the internet?	The success of the website is interlinked with the usability of the website. ...The total number of index pages defy the actual success of the website.
8.	On the scale of 1-5 how it is easy to understand the buttons on the website?(5-very easy,4-easy,3-sufficient,2-satisfactory,1-difficult)	The buttons play a key role with respect to the success of the website.
9.	On what scale do you give rating to the availability of the required book that you want is available when correct string or keyword or author name is given Do you find the book you want to read? (5- very easy,4- easy,3- difficult,2-poor,1-hard)	It helps to understand that the availability of the books in the website and the usefulness of the website such that if more and required books are easily available the intended users intention to use the website to search and read the books or buy them increases [3].
10.	Is the website running without any flaws or in general are there any other problems minute that are to be considered while developing the website?	This helps to understand the small problems that the web developers are unable to notice and also thus helps in much more accurate improvisation of the website design by removing the small flaws also [3].

II. Proposed Empirical Study

The purpose of conduction of empirical study for a product is very important. The usability of the product can be improved by the empirical study. In this paper we propose an empirical research method that is carried out in a small web company. The small web company is called..... ,this small web company is currently at the capability maturity model (CMM) level 4. The maturity level of the web company also helped us tremendously in our work. To carry out the empirical method procedure without any deviation from the quality standard of the web company.

III. EMPIRICAL METHOD

In this section we will explain the empirical research method that is used. We also explain the purpose or cause of choosing the particular empirical method.

a) OBJECTIVES

Our main objective is carrying out the usability measurement of the online book store website company namely <http://www.abebooks.com/>. The main focus is on the usability of the website. The web company is CMM level 3 organization, so

we have obtained a set of defined metrics that can be used in our plan of execution in order to measure the usability of the website. The usability measurement of the website in this project is based on the user's perspective. In order to know the user's perspective on the revisions that are made on the website with respect to design and to know the intentions of the user we need to use certain empirical method. There are various techniques to perform the study. The survey is used as the empirical method to reach our objective that is to empirically evaluate the usability of the website.

b) DATA COLLECTION

In order to collect data we use the online survey questionnaire. For the survey that we conduct it involves gathering two types of data collection methods. One of the data collection involves posting the online survey questionnaire link on the website that is under inspection and inform the users about the survey, the opinions that are given by the users are collected later as part of data collection. The website is useful in posting the questionnaire link as it helps in reducing the number of users sampling space to only those who use the website to retrieve the books. The second data collection method involves giving the questionnaire to the users who are accustomed to the website and who use more frequently which help in practically observe the responses and also the results obtained will be concrete results as they know what the book store website is lacking in terms of design perspective. Their answers can be much reliable once.

c) Subjects for sample

The sampling of the population should be so appropriate that the selected sample space should represent and reflect the whole population.... There are three kinds of classification of the users who use the book store website [1][3]. Children, adults and parents are the three classes that visit the website. Therefore as there are three classes that are present so we need to consider while analysis of data into three categories that is feedback from the children, Feedback from the adults and the feedback from the parents? But these data that is categorized doesn't affect the maintenance usability of the website as all the data together is combined in order to analyze. Therefore the only difference is that the responses are gathered using the data collection method using the different categories. But the results are combined in order to understand the usability measurement of the website.

d) Research Method

The online survey questionnaire is the research empirical method used in order to understand the usability measurement of the website. As the responses of the user are very much required we use the online survey. The survey and experiment generalize the sample to a large population and also both require a random sample here for the survey we use the sample as the users who visit the website to check with the books. But Our research involves the opinion of the population or user so with respect to survey and experiment the survey is better choice as the formal experiment's sample will determine the population not the population determining the sample.

Although formal experiment can also be used in this research as one variable can be using the current design of the website and the other variable is the website after the changes made according to the user and both the development results are analyzed to understand the better once. But we observed the survey is the better option and it helps to concentrate on the large population sample.

Other alternatives for the empirical method selection involve the case study and postmortem. The case study is not considered as it does not provide the controlled environment. The opinions of the user is must in order to understand the design flaws in the website. The work involves identifying the impact of the usability measurement of the website on the changes made to the design of the website. Thus the nature of study for empirical method is retrospective approach which should be followed. These two above stated requirements are in contrast to the case study empirical method.

Similarly the postmortem analysis is considered after the development of the project. This postmortem analysis help to understand and learn the issues in the product after development. There is no availability of the users who have been using the website for long time so it is hard to get reliable and concrete results. Thus it makes the choice of postmortem analysis impossible to generalize the results to large population.

More over the results can only be generalized in both the case study and survey to only to similar metrics and similar projects within the organization.

Thus we choose the survey as it helps in getting the data and to cumulate them to large extent of population sample size. The formal experiment is not chosen as it involves the control over the variables that are under the investigation. The current variable is the design revisions that cannot be influenced under the controlled environment but to revise based on the user revelations about the need for changes in the design of the website so thus the experiment is also neglected. Which gives us the only option the survey.

e) Approach

The steps followed while developing gathering the data.

1. The questionnaire is posed in the website that is under the investigation. The notification is given to the users about the coupons and the discounts that are there on purchase of the books. This process of getting the required book is time bounded.
2. The same questionnaire is traversed among more common users to get the results on the design aspects of the website and these users help in reflecting the general user group or large population and identify the important aspects of usability measurement by observation.
3. The obsolete entities and incomplete data are discarded when the data is collected[1].
4. To find the gap in the design the data collected is imbibed with the selected metrics and scales and then transforming the data to measurable once.
5. Finally map the data with the usability measurement activities and then provide the rules and protocols to the web designers to improve the website.

IV. SUMMARY

This section deals with the summary of the complete usability measurement of the online book store <http://www.abeebooks.com/>. The initial phase or part one include the measurement goal while measuring the usability of the website. The usability measurement is based on the Goal – Question- Metric (GQM) framework.

The questions were formulated and the corresponding metrics that are necessary to the question are stated. Then later the metrics are mapped to the attributes and entities. Furthermore the scale and measurement type are noticed. The questionnaire that is related to the usability of the website is written to understand then proposed the online web survey based on questionnaire that is prepared as the empirical method to state the goal.

REFERENCES

1. N. E. Fenton, Software metrics: a rigorous approach. London, UK: Chapman and Hall, 1991.
2. P. van Schaik and J. Ling, "Five Psychometric Scales for Online Measurement of the Quality of Human-Computer Interaction in Web Sites," International Journal of Human-Computer Interaction, vol. 18, no. 3, pp. 309–322, 2005.
3. M. G. MORRIS and J. M. TURNER, "Assessing users' subjective quality of experience with the world wide web: an exploratory examination of temporal changes in technology acceptance," International Journal of Human-Computer Studies, vol. 54, no. 6, pp. 877–901, Jun. 2001.
4. C. Flavian, R. Gurra, and C. Orús, "Web design: a key factor for the website success," Journal of Systems and Information Technology, vol. 11, no. 2, pp. 168–184, May 2009.