ASSESSING THE USABILITY OF UNIVERSITY WEBSITES: AN EMPIRICAL STUDY ON NAMIK KEMAL UNIVERSITY

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ABSTRACT
Web sites are emerging as a key component of an organization's survival in our ever globalizing competitive world. Usability of a web site has assumed a great deal of importance in terms of satisfying web site users' needs and expectations. The aim of the study is to evaluate and to explore the usability level of Namık Kemal University (NKU) website and provide guidance to develop better and more usable web sites. The research hypotheses have posed six different theoretical factors to be positively associated with website usability. The results have revealed that five of the six factors can positively and significantly affect the web site usability perceptions of NKU members. Results also revealed that some of the demographic factors tested, such as gender and web experience, have significant impacts on usability perceptions of individual users. Furthermore, the study also discusses the potential benefits of improved website usability on governance and proposes ways to improve the usability of websites.
Keywords: Information and Communication Technologies, Governance, Website, Usability, University.

1. INTRODUCTION

The internet is radically changing the traditional way that organizations interact with public. For organizations, the web gives access to a large audience and improves operational efficiency. Web sites are becoming key components of an organization's survival in the globalized competition. The web site represents an organization, communicating an organization's culture, values, and vision. The web site acts as a delivery mechanism for services that facilitate various tasks a stakeholder needs to perform. The site also serves as a platform through which an organization can interact with its stakeholders.

University web sites are no exception. The university website is not only a cost efficient and timely method to communicate with various stakeholders such as students, faculty, administrative staff and visitors it is also a way for a university to shape its image. Universities need to do everything within their power to keep positive images with their various constituents, and one way to do this is to make use of the opportunities website presents.

Observations mentioned above underline the vitality of usability issue for the websites. Usability has assumed a great deal of importance in terms of satisfying web site users' needs and expectations (Patterson and Ellis, 2004). Usability has been a popular theme that is extensively studied in the field of human-computer interaction (HCI) field (Shneiderman, 1998). Aldwyn (2011) argues that usability is a requirement to survive in internet environment. Nielsen (2000) states the usability rules the web. The same author argues usability is an extremely important aspect of individual website and overall website design. So, web design must directly face users with the specific needs, and must make sure that users are pleasant to successfully complete tasks with web (Yan and Guo, 2010).

The number of studies on usability of university web sites is very limited. One of the most recent studies on usability of university websites is conducted by Caglar and Mentes (2012) the study reveals dissatisfaction and other usability problems of a European University of Lefke which is located at Northern Cyprus. Another recent study is a case study conducted by Eksioglu et. al, (2011) which aims to assess the website usability of Industrial Engineering Department of Bogazici University and reveals some design issues regarding the department's web site. The study by Sengel and Oncu (2010) assessing the usability of Uludag University website concludes that there are differences between the responses of males and females to usability. Dominic and Jati (2010) study on usability of Malaysian universities websites exhibit that most of Malaysian universities are neglecting performance and quality criteria. Bautista et. al (2010) conducted at four different universities document the challenges encountered by users during their attempt to complete the tasks in three areas, namely content presentation, information structure, and navigation.

This research, aims to measure the usability of the Namık Kemal University (NKU) web site via the five assumed factors of usability defined by WAMMI (Website Analysis and Measurement Inventory): attractiveness, controllability, helpfulness, efficiency and learnability. The research is important because the

results are expected to provide guidance for developing better and more usable web sites not only for NKU but for other higher educational institutions as well.

This paper is composed of six sections. Introduction (Section 1) is followed by Literature Review (Section 2) where the concept of usability and the five assumed components of website usability that are employed for the research are explained and discussed. In Research Methodology (Section 3) detailed information regarding the survey and the way the survey is conducted is explained. Research Hypotheses (Section 4) lists and details the six hypotheses that are tested. Five of the hypotheses are constructed on one of the five assumed factors of usability. The sixth hypothesis is constructed on demographic factors. Findings and Analysis section (Section 5) presents the results that the research reveals. Conclusion and Discussion (Section 6) is the last section of the study. The section summarizes the overall results; provide guidance for more usable web sites, discusses the other possible contributions (such as better governance via improved communication with stakeholders) that higher usability could initiate. The section also highlights topics for further research in the area.

2. LITERATURE REVIEW

Usability is defined in different terms by multiple researchers. Shackel (2009) describes usability as "a technology's capability to be used easily and effectively by the specified range of users, given specified training and user support, to fulfill the specified range of tasks, within the specified range of environmental scenarios". According to Preece (1994) "usability is measured of in which a system can be learned and used, its safety, effectiveness and efficiency and the attitude of its users towards it." Zaphiris and Darin (2001) define web usability as "anyone using any kind of web browsing technology must be able to visit any site and get a complete understanding of the information, as well as have the full and complete ability to interact with the site if that is necessary."

Usability refers to terms such as ease of use and ease of learning that implied providing users with systems requiring minimum cognitive and physical effort to accomplish users' needs and expectations (Sindhuja and Surajith, 2009). Powell (2000) argues the web site usability as "the extent to which a site can be used by a specified group of users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use". In other words, the web site usability is a test on the successfulness of web site's user in doing some task or finding information in the web site. (Yusof et. al, 2010)

Usability of the website plays a central role in establishing a healthy communication between the university and its stakeholders. The healthy communication between the university management and the stakeholders can undoubtedly contribute to well governance of the university in many ways. First, a well managed website with high usability can stimulate a healthy dialogue between the university and its stakeholders. Dialogue lies at the hearth of communication and plays a central role in communication (Gutierrez- Garcia, 2008).

Listening to the stakeholders' concerns will give university administrations the opportunity to make well planned decisions. Thus, another contribution of dialogue with the stakeholders is the reduction of conflicts due to the increased confidence between the parties (Burchell and Cook, 2008). The engagement established on a healthy dialogue with stakeholders may lead to the inclusion of stakeholder demands and expectations to become a part of decisions made by the university administrators (Steinmann and Zerfaß, 1993). The inclusion of the stakeholders' expectations shaped via dialogue to the decision process will add value to the good governance practices. Focusing on stakeholders with legitimate expectations and managing the relationships with them will contribute towards transparency (Columbine, 2009) which is the fundamental ingredient of good governance.

There are numerous tests for evaluating the website usability. Some examples are, QUIS (Questionnaire for User Interface Satisfaction), SUMI (Software Usability Measurement Inventory), NIST Web Metrics (The National Institute of Standards and Technology Web Metrics). More recently developed questionnaires to measure the user satisfaction of web sites are MUMMS (Measuring the Usability of Multi-Media) to assess multimedia software and WAMMI to assess web sites (Levi and Conrad, 2001).

WAMMI is a one of the most popular evaluation tool for websites. It was developed by Human Factors Research Group (HFRG) in 1999. WAMMI is based on a questionnaire filled by visitors of a website, and gives a measure of how useful and easy it is to use the visitors found the site (Claridge and Kirakowski, 2011).

As mentioned previously WAMMI proposes five factors to assess the usability of websites. Brief explanations for the WAMMI factors are as follows (http://www.wammi.com/demo/graph.html):

Attractiveness

Attractiveness is one of the key factors to a successful website (Liu and Arnett, 2000). Attractiveness is the capability of the software product to be attractive to the user (e.g., through use of color or graphic design; ISO/IEC 9126-1, 2001). Attractive websites are visually pleasant, and appeal the interest of the users, whether it is functionality or information. Tan and Wei (2006) argue that the appearance of a website is a crucial factor that improves the perception of information in order for subjects to perform better cognitive mapping and assessment of decisions for execution. The same study suggests that the graphical representations such as icons, colors, images and animations, give website a higher attractiveness. This could improve the degree of users' satisfaction with the website (Zhang et. al, 2000).

Controllability

The degree of control a person reports has over his/her interaction with a particular website. In other words, controllability is whether users feel that they are in control of the software product (Seffah et.al. 2006). If a site is well on controllability the users most probably feel they can navigate around it with ease and do the things they want to do. Poor controllability of a website usually means a poorly organized site that disrupts the way they normally expect to do things.

Efficiency

According to International Organization for Standardization (ISO) efficiency refers to the resources used in completing a task (ISO,1998). Lee and Kozar (2011) define website efficiency as a representation of resources expended in relation to achieving goals while visiting a website. The users perceive efficiency when they can achieve goals with a quick visit without putting forth much cognitive effort. When site users give a high efficiency rating they feel they can quickly locate and do what is of interest to them in an effective and economical manner. They feel that the web site responds at a reasonable speed. Disorientation, or the tendency to lose one's sense of location in a Web site, can cause users to become frustrated, lose interest, and experience a measurable decline in efficiency (McDonald and Stevenson, 1998)

Helpfulness

Paul Siegel argues that helpfulness is the key to web success. Finding ways to help users for every step of their visit: before they reach the site, during their visit, and after the visit play a crucial role on the usability (http://www.insiderreports.com). A website which is high on helpfulness corresponds with the users' expectations about its content and structure. A site with a low level of helpfulness can be misleading about its layout and content.

Learnability

In order to achieve the best efficiency and effectiveness possible while using a device, users must first learn how to interact with the device. Learnability is related to achieving a sufficient level of competence with the device to be able to complete goals in an efficient and effective manner. The ease, in time or effort, with which users can learn a device, is its learnability. Learnability or the ease with which the features required for achieving particular goals can be mastered. It is the capability of the software product to enable users to feel that they can productively use the software product right away and then quickly learn other new (for them) functionalities (Seffah et.al. 2006). There are numerous studies that identify learnability as a key attribute of the usability (Brink et al., 2002; Guenther, 2003; Nielson, 1993). Based on Nielson's usability model (1993), learnability refers to how easy it is for casual users to learn a system. In the websites with high learnability users feel they are able to start using the site with the minimum of introductions and everything is easy to understand from the start. In the websites with low learnability users feel that the site may be using concepts or terminologies which are unfamiliar and need more explanations.

3. RESEARCH METHODOLOGY

In this section, the research administration and survey design, main research hypothesis and their justifications, empirical analysis results and major findings will be discussed.

Research Administration and Survey Design

The main purpose of this research is to measure the usability of the NKU website. The research employed non-probability convenience sampling methods to collect data from NKU students, faculty members and administrative staff. This research was conducted during the period of December 2011 to January 2012. The research was conducted by following two different methods simultaneously. First, some internal stakeholders (students, faculty members and the administrative staff) were personally asked to respond to the online questionnaire that was posted to the NKU website. Second, the link to access the questionnaire was forwarded to all internal stakeholders via NKU email system. In order to encourage the participation a 50 Turkish Liras

(around 28$) gift check of an online bookstore was offered to a participant. The number of valid questionnaires reached 339 as of 16 January 2012 which was the cutoff date for the survey implementation.

The first part of the research contains the demographic profile of respondents including gender, age, and position at the NKU, internet usage duration and type of browser used. Second part is about the expectations of participants about the usability of the university website. WAMMI questionnaire is employed for the research. The WAMMI questionnaire is composed of three parts and has total of 22 questions. The questionnaire assesses website usability by asking participants to compare their expectations against what they actually find on the website on previously mentioned five dimensions, plus a 2 item construct of overall satisfaction. Five point Likert scale was used to measure usability and satisfaction of NKU web sites anchored as "strongly agree=1" to "strongly disagree=5". The final sections of the survey were composed of the optional communication details of participants for lottery purposes and general feedbacks from participants about NKU web site as an open ended question.

4.   RESEARCH HYPOTHESES

The research predicts that all five of the assumed usability factors are positively associated with the usability of the NKU website. The first assumed usability factor is attractiveness.

H1: Usability of the NKU website is positively associated with its attractiveness.

Attractiveness is the capability of the software product to be attractive to the user through use of factors such as color or graphic design. The research predicts that a higher attractiveness perception by NKU website users will result in an increased level of usability for the NKU website.

H2: Usability of the NKU website is positively associated with its controllability.

The second assumed usability factor is controllability. Controllability is basically how users feel when they navigate around the site. If the users feel in charge and easily execute their needs on the site this points to increased controllability. The research predicts that a higher controllability perception by the NKU website users will result in an increased level of usability for the NKU website.

H3: Usability of the NKU website is positively associated with its helpfulness.

The third assumed usability factor is helpfulness. A website which is high on helpfulness will fulfill the users' expectations about its content, layout and structure. The research predicts that a higher helpfulness perception by the NKU website users will result in an increased level of usability for the NKU website.

H4: Usability of the NKU website is positively associated with its efficiency.

The forth assumed usability factor is efficiency. An efficient website allows its users to quickly locate and do what is of interest to them in an effective and economical manner. The research predicts that a higher efficiency perception by the NKU website users will result in an increased level of usability for the NKU website.

H5: Usability of the NKU website is positively associated with its learnability.

The fifth assumed usability factor is learnability. Learnability is related to achieving a sufficient level of competence with the device to be able to complete goals in an efficient and effective manner. The ease, in time or effort, with which users can learn a device, is its learnability. The research predicts that a higher learnability perception by the NKU website users will result in an increased level of usability for the NKU website.

H6: Usability of web sites will be related with participants' gender, age, internet experience and position at the university

The research further inquired whether participants' usability perceptions of NKU web sites have significant differences based on gender, age, internet experience and position at the university. Gender is classified as a dichotomous variable as males and females. Participants were grouped in two sections based on their age as participants below middle age and participants above middle ages. Middle age is defined as 35 years of age. Internet experience is investigated based on two groups as short term and long terms years of experience. The cutoff point is decided as 5 years of experience. Hence, participants were assigned previously mentioned two groups based on whether they have been using internet more or less than 5 years. The final participant

professional characteristic is whether they are students, academic personnel or administrative personnel. Statistical differences were investigated among these three groups of professional careers.

5. FINDINGS AND ANALYSIS
In this section, the descriptive statistics, regression analysis results to test the research hypothesis and major findings will be presented.

Descriptive Statistics
The major descriptive statistics are presented in Table 1 below and discussed accordingly.

Table 1: Descriptive Statistics

Characteristics	N	%	Characteristics	N	%
Gender			Internet Experience (Year)		
Female	122	36,2	<1	3	0,9
Male	215	63,8	1-3	17	5,1
Occupation			3-5	38	11,3
Student	207	61,6	5-10	144	43,0
Faculty	94	28,0	>10	133	39,7
Administrative	35	10,4	Mostly Used Browser		
Age (Year)			IE	114	34,1
<18	13	3,8	Firefox	62	18,6
18-24	189	55,9	Chrome	151	45,2
25-34	68	20,1	Safari	3	0,9
35-44	46	13,6	Opera	1	0,3
45-54	19	5,6	Other	3	0,9
55-64	1	0,3	Time Spend Online (Min)		
>65	2	0,6	<2	33	9,8
Affiliation with the University (Year)			3-5	60	17,8
<1	151	44,9	6-10	22	6,5
1-3	95	28,3	11-30	42	12,4
3-5	35	10,4	31-60	56	16,6
>5	55	16,4	>60	125	37,0

As it is presented at Table 1 above, most of the participants were males (63,8%) and about one third were female (36,2%). More than 60% of the participants were composed of students, 28% was faculty members and the rest (10,4%) was administrative staff. More than 50% of participants were below 24 years of age. Since most of the participants were students, this finding is not surprising. Almost half of the respondents (73,2%) were at the university for less than 3 years. Since NKU is a relatively new university, established only 5 years ago, and most of the participants were students, this result is expected. More than 82% of participants have been using the internet for more than 5 years. The most frequently used internet browsers have turned out to be Chrome (45,2%) and Internet Explorer (34,1%). Finally, 37% of the respondents indicated that they spend more than 60 minutes online each time they are connected and the percentage of respondents that spend less than 5 minutes online is 27,6%.

Hypothesis Testing
The research hypotheses presented in section B were tested by regression analysis. Linear regression models were run to test six individual models. Before feeding in regression equations, the items/questions representing dependent and independent variables as six constructs of WAMMI were aggregated by using the method defined by Tavakolian (1989). In this method, the simple arithmetic average of each factor was calculated. Further to make the factors more normally distributed and continuous, each aggregated factors' logarithms were calculated. The regression results of the WAMMI test were presented in Table 2 below.

Table 2: WAMMI Test Results

Independent Variables	Dependent Variable
	LN(Usability) (Linear Regression)
Constant	-0,394* (0,057)
LN(Attractiveness)	0,337* (0,059)
LN(Control)	-0,014ns

	(0,083)
LN(Helpfulness)	0,172** (0,078)
LN(Efficiency)	0,384* (0,074)
LN(Learnability)	0,419* (0,078)
Df	294
Adj-R2	0,737

*Standard Errors are Given in Parenthesis, *p<0,01, **p<0,05, ns=non-significant*

As it is easily observed from Table 2 above, all WAMMI constructs, except Control have turned out to be significant with high significance degrees (p<0,001 and p<0,05). The WAMMI factors are positively related with usability perceptions as it is hypothesized in underlying theory. Hypothesis 1, Hypothesis 3, Hypothesis 4 and Hypothesis 5 are accepted, however Hypothesis 2 is rejected.

The second set of regression tests are aimed to investigate whether demographic or professional differences among survey participants would have caused any statistical differences in their usability perceptions of NKU web site as proposed in Hypothesis 6. The results are presented in Table 3 below.

Table 3: Effects of Demographic and Professional Differences

Independent Variables	Dependent Variable
	LN(Usability) (Linear Regression)
Constant	1,313* (0,089)
Gender	-0,107** (0,048)
Age (Over 34)	0,022ns (0,067)
Academic	-0,017ns (0,060)
Experience (Over 5 years)	-0,136** (0,061)
Df	329
Adj-R2	0,029

*Standard Errors are Given in Parenthesis, *p<0,01, **p<0,05, ns=non-significant*

As it can be observed from Table 3 above, gender has turned out to be a significant variable in predicting participants' perceptions on usability of NKU web site. Since the differences were observed based on males when coding the dummy gender variable, it can be interpreted that males find NKU web site less usable compared to their female counterparts, given the existence of negative coefficient. Age has not turned out to be a significant variable. The usability perception of participants who are 34 years and older were significantly different from the participants that are younger than 34 years. Similarly, professional differences have not caused any differences in web site usability perceptions of participants as well. However, internet usage experience has revealed significant differences in usability perceptions of participants. Participants with 5 years or more experience seem to be less satisfied with the usability of NKU web site compared to the ones who are less experienced (less than 5 years).

6. CONCLUSION AND DISCUSSION
Web sites are becoming key components of an organization's survival in the globalized competition. University web sites are no exception. The university website is not only a cost efficient and timely method to communicate with various stakeholders. Statements mentioned above underline the vitality of usability issue for the websites. Usability has assumed a great deal of importance in terms of satisfying web site users' needs and expectations.

The study aims to measure the usability of the Namık Kemal University (NKU) web site via the five assumed factors of usability: attractiveness, controllability, helpfulness, efficiency and learnability.

The results reveal that four of the five usability factors are positively related with usability perception as it is hypothesized in the underlying theory. Research hypotheses that claim Usability of the NKU website is positively associated with its attractiveness (Hypothesis 1), helpfulness (Hypothesis 3), efficiency (Hypothesis

4), and learnability (Hypothesis 5) are accepted. However hypothesis that claim usability of the NKU website is positively associated with its controllability (Hypothesis 2) is rejected.

The demographics related (Hypothesis 6) findings of the study are interesting. Results show gender to be a significant variable in predicting participants' perceptions on usability of NKU web site. Male participants find NKU web site less usable compared to their female counterparts, given the existence of negative coefficient. Age has not turned out to be a significant variable. Similarly, occupational differences have not caused any differences in web site usability perceptions of participants. However, internet usage experience has revealed significant differences in usability perceptions of participants. Participants with 5 years or more experience seem to be less satisfied with the usability of NKU web site compared to the ones who are less experienced (less than 5 years).

Usability of the website plays a central role in establishing a healthy communication between the university and its stakeholders. The healthy communication between the university management and the stakeholders can undoubtedly contribute to well governance of the university in many ways. University web sites serve as platform that stakeholders can voice their concerns and demands from the university administration. Listening to the stakeholders' concerns will give university administrations the opportunity to make well planned decisions. Thus, another contribution of dialogue with the stakeholders is the reduction of conflicts due to the increased confidence between the parties. The engagement established on a healthy dialogue with stakeholders may lead to the inclusion of stakeholder demands and expectations to become a part of decisions made by the university administrators. The inclusion of the stakeholders' expectations shaped via dialogue to the decision process will add value to the good governance practices. Focusing on stakeholders with legitimate expectations and managing the relationships with them will contribute towards transparency which is the fundamental ingredient of good governance.

Continuous feedback from the users presents valuable input to universities to improve their web sites. In order to satisfy the constantly changing demands of the website users and improve the usability of the website, university administrators may deploy a site intercept survey on their website and collect survey data for an extended time which will give the administrators extensive opportunities to improve the website.

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