# AN EXPLORATORY SURVEY OF THE SITE OF JAZAN TECHNICAL COLLEGE IN SAUDI ARABIA BY ADOPTING STANDARDS OF RESEARCH AND NAVIGATION SYSTEMS

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**Abstract -** Education institutions will not be able to attract and help students to browse their sites unless they succeed in designing websites that meet quality standards, standards of content, navigability and usability. The aim of this study is to identify the extent to which the standards of the research and navigation systems have been adopted at the site of Jazan Technical College.

**Keywords -** websites navigability, research systems and navigation systems.

## I. INTRODUCTION

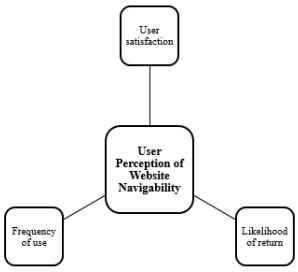
The numerous functionalities of websites and the ease with which they can be created and used (Lee and Kozar, 2012) has forced businesses and other institutions such as schools to quickly adopt the latest technology. However, as Chen and Ryu (2013) note, navigating and finding information on the web remains a challenge for most users because of the unfriendliness of most website user interfaces. This case is especially prevalent among non-commercial entities, such as schools and other businesses, that do not conduct their main transactions online. For example, first-time users of a Saudi university website comprise mainly of students who are seeking admission into the involved institution, and their interest is registration and course information. Nonetheless, more often than not, they face difficulties navigating the website, which frustrates them. Given the increasing competition and high levels of competitive advantage that a high-quality website offers (Canali, Balzarotti and Francillon, 2013), the importance of flawless website navigability cannot be understated.

On the other hand, the subject of website navigability among institutions of higher learning in Saudi Arabia remains underexplored. Therefore, this paper focuses on select one college site in Saudi Arabian to measure the navigability and know the college efforts of to enhance their website navigability. By studying this institution website navigability, this paper aims to fill the literature gap on the subject and implement a model to measure the navigability in terms of research and navigation systems on one website.

## II. EXISTING RESEARCH

### 2.1. 1997-2002

Palmer (2002) suggests the use of qualitative and subjective metrics to assess website navigability. These aspects are the likelihood of return, user satisfaction, and frequency of use (Palmer, 2002) as shown in Figure 1 below. The data that yielded these findings were collected using three methods: software agents, third-party ratings and a jury. This period will therefore focus on the three metrics. This is not to say that there were no quantitative measurement methods used during this period. For example, Zaphiris & Mtei (2000) found that eight links per web page in a site that has sixty-four links ensured low navigation efforts and fast response time. Moreover, this era also saw the development of the three-click heuristic rule of navigability, which suggests that an optimum website should ensure that the user is able to get from the home page to any other page on the site in three clicks or fewer (Zhang, Zhu & Greenwood, 2004).




**Adapted from: Source (Researcher illustration of Palmer (2002))**
**Figure 1: The Subjective Model**

### 2.2. 2003-2007

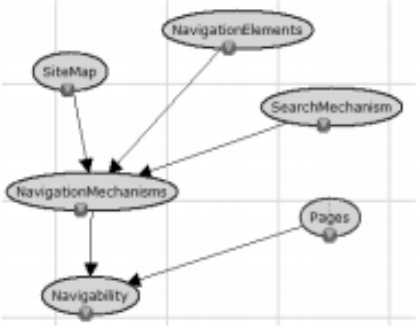
More often than not, these checklists are developed based on what consumers consider as ideal in terms of aesthetics and navigability, for example, through surveys and questionnaires. Therefore, the results from this method are user-specific and cannot be generalised. The second method involves the use of actual quantitative metrics. Zhang, Zhu & Greenwood (2004) suggests analysing log files. In a process called web mining, website owners use user access log files to determine behaviour from website visitors (Suneetha & Krishnamoorthi, 2009). Unlike the previous method, which relies on customer feedback, log-files rely on customer behaviour. This allows for

the measurement and evaluation of quantitative aspects such as the number of times web pages are visited, pages per visitor, return views, and the average duration of visitor sessions (Zhang, Zhu & Greenwood, 2004).

Consequently, the ANTS (Automatic-Navigability-Testing-System) was developed, which allowed website owners to understand user behaviour without continuous observation and establish the most effective navigation system (González et al., 2006). The system, among other things, recorded the position of users on the navigational map and time spent on each website. However, the system could not record patterns, which meant that it was not possible to establish a relationship between behaviour and navigability (Zhang, Zhu & Greenwood, 2004).
During this period, researchers also developed further models to measure website navigability. Earlier models used customer feedback to measure the effectiveness of navigation links. However, as more websites developed, it became apparent that the process of adding hyperlinks and sub-links without proper planning was both costly and time-consuming. Therefore, scholars developed models to measure expected websites and predict the number of links to be included. Zhou, Leung & Winoto (2007) proposed the use of MNav, which is a website navigability measure based on the Markov model. This system measures the navigability of a website by relying on the hyperlinks in a website that lead to separate pages. An example is the case of the back button. All standard browsers offer them.

**2.3. 2008-2012**

According to Vaucher & Sahraoui (2010), there are two ways that a web visitor can navigate the web. These methods are: using links to move from page to page or using a search bar. Similarly, between 2008 and 2012, there was significant focus on website aesthetics that was unprecedented in the early periods.




**Adapted from: Source (Vaucher and Sahraoui, 2010: 823)**
**Figure 2: The site navigability model**

Moreover, studies emerged that supported the inclusion of aesthetic into website navigability. For example, businesses may think that the design of the search bar does not matter, however research has shown that the search bar contributes to the aesthetic value of a website (Vaucher & Sahraoui, 2010), which, in general, incite users to spend longer on a website. A search box allows website users to access pages of the site that may not be explicitly linked (Vaucher & Sahraoui, 2010). The effectiveness of a search bar as a navigability device is evaluated based on, for example, its ability to provide suggestions, retrieve the correct information, and the speed of execution.

**2.4. 2013-2017**

Most measurement techniques within this period include previously recognised aspects such as qualitative information through client feedback, quantitative findings from page visitor behaviour, self-updating websites and probability approaches, among others. Other strategies include the three-click model, which Panda, Swain & Mall (2015) refer to as the four strikeouts necessary to arrive at the desired page. Regardless, most of the current measurability systems are an evolution from previous models. With the large number of websites, developers are increasingly turning to the aesthetic appearance of sites to gain and retain site visitor attention (Reinecke et al., 2013). Therefore, for the 2013-2017 era, the research will explore how aesthetics integrate with website navigability. The segment will borrow heavily from the works of Wojdynski & Kalyanaraman (2016), who propose that there are three dimensions that can be used to measure the navigability of a website with regards to layout: logic of structure, clarity of structure, and clarity of target.
In short, scientists have attempted to make the process of measuring website navigability simple by developing models that incorporate the two measurement techniques or use either of the metrics. The literature review explores some of the models developed in the past twenty years. For ease of discussion, the research classifies the model into either: Subjective Aspect and Objective Aspect. Based on the subjective model, website navigability is measured based on likelihood of return, user satisfaction and frequency of use. Also, the study identified five objective models based on Tree-graph or three-clicks, Probabilistic quality, Navigation, ANTS (Automatic-Navigability-Testing-System) and MNav model.

## III. APPROACH

The study is based on a qualitative research methodology and employs criteria in the evaluation of the college's site by conducting a practical test (the researcher observes the participant's movement within the site through specific steps and provides questions at a specific time). Second, quantitative research was used in the form of a questionnaire given to the participants; the questionnaire identified the availability of elements of the research and

navigation systems, the possibility of mobility at the site and the degree of satisfaction with the performance and suitability to their information needs.

In terms of measuring the navigability on one website, it is useful to investigate one site and evaluate it using criteria to apply subjective and objective aspects. Also, it is important to do a simple test on the site using participants who can evaluate how they used the site. The model below is to apply the methodology in terms of user satisfaction, the frequency of use, time and number of clicks attempts.

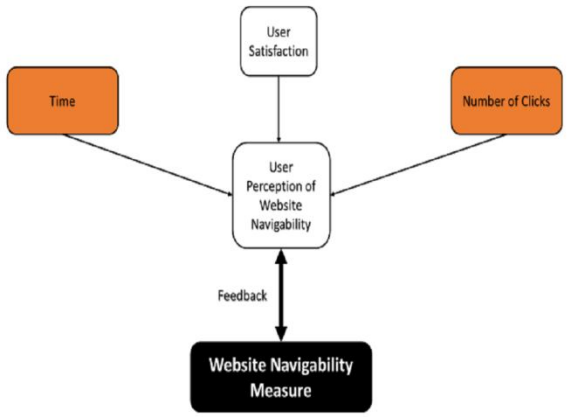



**Figure 3: Proposed navigability measurement model for one website.**

On the other hand, there are the criteria that should be taken into consideration when designing navigation and research systems on a website.

| Characteristics of navigation systems | Characteristics of research systems |
|---|---|
| General navigation | Search box |
| History list | Search limitations |
| Site map | Search options |
| Site index | Expected list of keywords |
| Labelling index | List of results |
| Hierarchal systems | Search box body |
| Help | Help |

**Table 1: Characteristics of navigation and search systems on a site:**

## IV. PRELIMINARY RESULTS

### Characteristics of the search system

The results reveal that the features of the site's search system are incomplete. There are two types of research systems available at the main college site: a simple and advanced research. The search box provided by the website is simple and easy to use. Therefore, the user can print the desired search terms and use the search criteria. The importance of research determinants is that they contribute to narrowing the scope of the research. In contrast, the site does not provide some of the characteristics of the other important search system; it does not contain search options, nor a list of expected keywords, which would help the beneficiary in the execution of the search. In addition to this, the search circle is limited to the content of the site and does not give the possibility of searching outside. It is obvious that the presence of search options would provide an opportunity for the beneficiary to expand the search. As for the list of results provided by the site's search system, it limits the actual number of results retrieved.

### Characteristics of navigation systems:

The site of the college depends on the general navigation system in organising the information, where the address system is located on the home page with the source resource (URL). Here, the addressing system is available on some sub-pages and is not available on others. There is no help link on the main page of the site. Rather, the help is a service (contact us) in the event of any difficulties in dealing with the site.

### The practical part:

When calculating the rate of seconds between clicks, it is useful to determine the proportion and accuracy of navigation on the site in terms of ease and difficulty. The researcher used a standard that could be tested on any site with a group of volunteers. The results were logical in terms of access to information on the site. Although the menu bar was clear and specific, there were a large number of titles. It is worth mentioning that access to an external link (such as the unified admission portal to procedure admission) is very complicated, so it may lose credibility.

The formula to standard mobility calculation on the website: Equation: The time spent between clicks =

$$\sum \frac{T}{N}$$

T = The time per second.
N = Attempts in clicks to reach the information or specific goal.

| Rate | Evaluation |
|---|---|
| 0 – 1 | Very High |
| 1 – 2 | Hight |
| 2 – 3 | Good |
| 3 – 4 | Average |
| 4 – 5 | Low |
| 5 – 6 | Weak |
| More than 6 | Worst |

**Table 2: The evaluation of rate.**

**Note:**
The normal range is 1 second, which is excellent because every second has one click, and this indicates that the navigation of the site is clear and perfect.
The table 2 shows that the results in terms of equation through testing.

| Test | The total of time (T) | The total of click (N) | The seconds per click (T/N) |
|---|---|---|---|
| Open the site from the browser | 760 | 123 | 6.18 |
| Show the college's information | 45 | 15 | 3.00 |
| Know the geographical location of the college | 20 | 12 | 1.67 |
| How to communicate with the college through the site | 15 | 10 | 1.50 |
| Access to health unit information | 34 | 10 | 3.40 |
| Know the admission requirements | 63 | 10 | 6.30 |
| Access the Blackboard page | 10 | 10 | 1.00 |
| Access to the unified admission portal | 1910 | 182 | 10.49 |

**Table 2: The calculation of seconds per each click.**

## CONCLUSION AND FURTHER WORK

The navigability model shown in Figure 3 was developed. The study was conducted in two ways. There was a theoretical aspect and a practical aspect, and questions were asked about the satisfaction of users and the calibration of the search and navigation systems. A simple test to calculate the number of seconds for each click attempt to reach the intended information or goal was used. This was done by dividing the number of seconds by the number of click attempts, where each click was generally equal to 1 second. There was a standard for the rate of seconds between each click, as showed in Table 2.

The major limitation of the research was the fact that when testing the navigability of the website, user responses and usage log files could not be collected. Accordingly, future studies should collect the views of users and developers regarding their positions on the navigability of websites and supplement these with website usage logfiles. Although there was a case study to collect user responses through a survey, this was still limited. In the future, it would be good to develop an integrated system to monitor the performance of the user; this could possibly be placed in each site to extract the results as the visitor's browse the site and attempt to click.

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