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Heuristic Evaluation for e-Government Websites in Saudi Arabia

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ABSTRACT

This paper reports on an evaluation of two e-Government websites in Saudi Arabia. The aim of the research was to adapt a heuristic evaluation approach that would explain usability problems found on Saudi e-Government websites. The work defines an evaluative approach that offers a detailed view of web design on e-Government websites. The evaluation of the two websites gave a mixed picture with both sites meeting some of the heuristics to a greater or lesser extent. These results will facilitate the improvement of the websites allowing such websites to be more effective in the way they deliver information, and identified the current usability problems found in e-Government websites in Saudi Arabia.

Keywords: e-Government website evaluation, Heuristic evaluation, Usability Methods, Website design evaluation.

1 Introduction

Providing government services via the Internet has become a worldwide practice and is routinely described as e-Government. There are many examples of poor websites and many problems have emerged for users of e-Government services. Understanding these problems is an important aspect in the building and evaluation of such websites. The effective use of evaluative techniques can increase the efficiency of these sites and hence encourage people to use them. These are important issues when the public are being encouraged to transact business through these sites. The use of heuristic evaluation in the development and maintenance of government websites, particularly from an expert evaluator perspective can greatly aid the effectiveness of such sites and the services they offer.

Saudi Arabia has a special focus on providing government services electronically. This has been supported by a supreme Royal Decree which directed the Ministry of Communication to formulate plans to implement e-government. The Ministry devolved the development of e-government to a special organisation called the Yesser programme, who were asked to specify the standards and the degree of control of such applications (Yesser, 2007). Yesser has accomplished a number of important steps in the development of e-Government. Some of the most important elements were the numerous standards and documents that helped underpin e-Government. Some of these standards cover recommendations regarding the design of e-Government websites. Currently, in Saudi Arabia, there are a number of e-Government websites, and some of them have achieved a Digital Excellence Award (DEA) for their design. Thus, this research will concentrate on examining usability by using a heuristic approach for two government agencies, one prior to the Yesser programme, and one supported by Yesser.

2. Related works

Heuristic evaluation is identified as an approach to evaluate the design of a given website to define any usability problems that may exist (Nielsen, 1994; Pickard, 2007, p.231). A heuristic approach has several features as identified by a number of research studies. Basically, Ahmed (2008), Ardito et al (2006), and Hvannberg et al (2006) showed that this approach enables evaluators to find obvious

usability problems within a limited period of time. This feature of the heuristic approach is in contrast with usability testing, where a number of interface problems may be ignored. This is because usability testing depends on the application of certain experimental tasks; it also needs more resources and takes longer (Hvannberg et al, 2006). Thus, heuristic evaluation is a low-cost approach when compared with usability testing (Ahmed, 2008, Ardito et al 2006). However, although evaluators are considered as sample users; they are not typical users for the target site. Thus, the results may be regarded as suspect because they do not reflect actual users' opinions. Researchers, including Hvannberg et al (2006), have used heuristic evaluation before usability testing to predict what usability problems there might be; they then used their findings to design the tasks for usability testing.

3. Methods Used

In terms of the of evaluators, as Pickard (2007, p.231) and Ardito et al (2006) note, an evaluator should be an expert as this allows for deeper inspection to be made of levels of compliance; such an expert will also have the knowledge to suggest improvements which will help the evaluation. Pickard (2007, p.233) considered that 3-5 evaluators was a reasonable number to identify the usability problems that might exist. In this research, as there are a limited number of government agencies, the heuristic evaluation was undertaken by three evaluators. Heuristic evaluation is based on guidelines, i.e. heuristic principles that evaluators use when they evaluate a site (Pickard, 2007, p.231, Brinck et al, 2002). A number of heuristic components make up each principle. Nielsen's heuristic principles (1994, 2001) show the fundamentals of this approach. Nielsen's identified ten principles, which vary from visibility of system status to help and documentation. Researchers in e-Government have derived their own approach from Nielsen's heuristic evaluation, particularly for e-Government. For example, Garcia et al. (2005) extended Nielsen's approach (2001) and derived six more related principles to cover the needs of an e-Government website. These include, for example, accessibility, security and privacy, and information precision. Although Garcia et al. (2005) provided a basis for the heuristics evaluation that was undertaken, there were some omissions in their approach; these were addressed by recourse to the literature in order to design an appropriate heuristic checklist consisting of a number of heuristic components which made up each principle. Thus, a detailed heuristic checklist was designed to extend the inspection to find particular usability problems and also to avoid the bias that might occur if evaluators did not cover each heuristic principle.

Several authors, such as Pierotti and Coropton (1995), Brinck et al. (2002), Businesslink (2007), Nielsen and Tahir (2002), and Yesser (2006) identified different heuristic concepts that can be used in addition to those mentioned in the work of Garcia et al (2005). However, there is a problem that some heuristic features may be repeated since they may belong to several principles. This problem was overcome by customising Garcia et al's (2005) principles and combining the best of the those mentioned above to give the principles listed in Table 1

ID	Principles	Description	Number of heuristics making up each principle
1	Consistency	Explains features of the websites to show their consistency with web standards.	11
2	Links and Navigation	The ability to allow users to navigate easily through appropriate links.	15
3	Helping Users	How effective the help system is in helping users use the site.	21
4	Features and Functions	Effective website features which enable users to interact with government	8
5	Data Entry Forms	Clear and simple data entry forms with a common structure and form throughout the website.	6
6	Visual Design	User should not have to memorise information. Instructions should be accessible from any part of the website	11
7	Accessibility for Visually Impaired Users	E-Government websites should be accessible to all citizens including those people with special needs.	3

ID	Principles	Description	Number of heuristics making up each principle
8	Security and Privacy	Government sites should be secure against any attack and citizens' information must always be secure on any government database.	5
9	Precision of Information	Essential information should be precise and correct as inaccuracies may affect the citizen. The government has a responsibility to keep its websites up-to-date, accurate and properly maintained	9

Table 1: The Adopted Heuristics Principles.

Three experts with a great deal of experience (8-10 years) in web design, and with knowledge of web usability, were chosen. The heuristic checklist was given to these experts who were asked to perform a heuristic evaluation over two agencies' websites G1 and G2. G1 established their site prior to Yesser, whereas G2 was supported by Yesser. Both websites had achieved DEA at different times (2007-2008). The evaluators were asked when they were completing the questionnaire to look for usability issues that would be seen as confusing or complicated by users. They were also asked to record suggestions concerning each heuristic, if possible. Each evaluator spent about two hours on each website working through the checklist. After their independent evaluation, a discussion was conducted with each evaluator to reach agreement on the usability problems that emerged from their evaluations.

4. Heuristic Evaluation Results

For a perfectly designed website, 100% of the heuristic components should be met for each principle, Figure 1 shows that this is not the case. The figure shows the percentage of heuristic components that were met for each principle, for example in the consistency principle there were 11 heuristic components (See Table 1) of which G1 met 55% of them. It can be seen that more heuristics components were satisfied in G2 than in G1. If it is assumed that, in order for each principle to be regarded as properly addressed, that 75% of the heuristic components need to be met, then G2 only properly addressed one principle (visual design), and G1 did not meet any. However, if the threshold is reduced to 50% then G1 was successful in meeting three principles (consistency, visual design, precision of information) compared to five in G2 (consistency, features and functions, visual design, security and privacy, precision of information). When considering all 89 heuristics, the results show that G2 achieved 43 heuristics, whereas G1 met only 30 heuristics. These findings indicate that neither site is performing well in meeting all the principles on the checklist. However, it can be seen that the G2 website performed better than the G1 site. Despite these results, the designers of both sites need to pay more attention to usability issues.

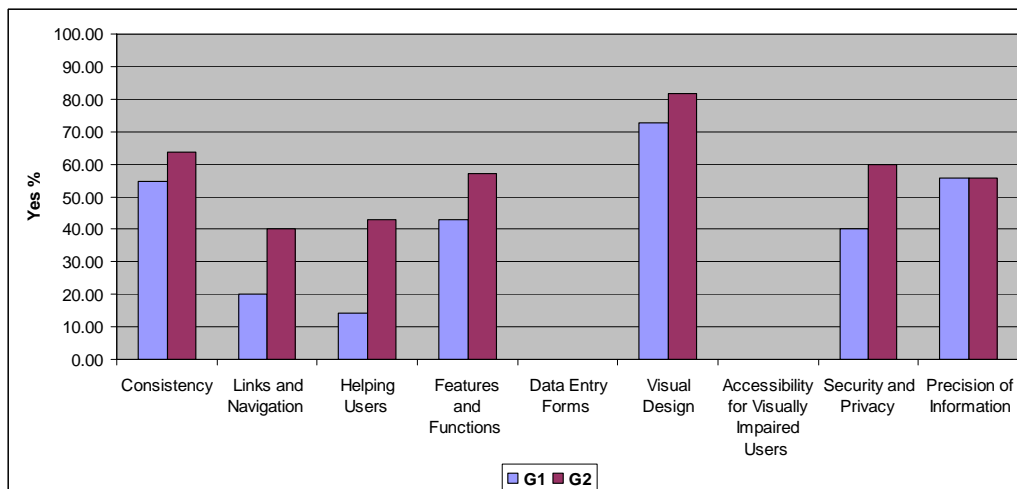


Figure 1: the results of Heuristic evaluation approach over two government agencies in Saudi Arabia

5. Conclusion

E-Government websites can be classified as being in the early stages of development in Saudi Arabia. At the moment, websites are available and provide information; but with inappropriate design that does little to encourage users to utilize e-Government services. These problems may also undermine the successful establishment of e-Government in Saudi Arabia. In particular, those principles that were related to tasks in the transaction stages (such as data entry forms) show considerable weakness and are in need of further improvement. It is important developers, as well as the Yesser programme, focus on usability aspects in order to improve the current position of e-Government in Saudi Arabia.

Further research will involve integrating the usability problems that were found in the design of websites as part of developing a comprehensive framework for e-Government websites. This could result in the integration of different more qualitative and quantitative approaches to obtain results that can help the development of e-Government websites more efficiently.

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