Jurnal Komunikasi
Malaysian Journal of Communication
Jilid 33(4) 2017: 190-203

Balancing Usability and Aesthetic Elements in Universities' Website: A Systematic Review

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ABSTRACT

Website is the first line of interactions between the universities and the patrons may it be the students, staff or the public. The usage of internet within universities has increased in this few years. More formal interactions are done through the universities websites or portals. Due to the increased use of the universities website, it has resulted in the importance of proper web design to ensure that the universities have an effective website. Thus, it is important that the design of the website be properly done to ensure effective use of the website and properly reflects the image of the Universities. One of the challenges in designing an effective website is ensuring good web usability and pleasing web aesthetics. Using SLR (Systematic Literature Review), this paper gathers the area of study regarding overall description of a quality website, website usability, web usability measurement, website aesthetics, web aesthetic measurements and to know whether there is the research regarding relationship between web usability and web aesthetics. This study was based on 658 papers gathered from the online library such as IEEE, ACM, Science Direct and Emerald Insight by using a search strategy that has been constructed in the research method. After the filtering process was done based on the inclusion and exclusion criteria, only 78 relevant papers are chosen as the body of knowledge of this study.

Keywords: *Web design, web usability, web aesthetics, web usability measurement, web aesthetic measurement.*

INTRODUCTION

Background of the Research

According to Azman et al. (2014), in 2013, it is reported that there are 2.7 billion people or 39% of the world's population are online and 750 million households are connected to the Internet. The Internet has brought about a huge change in the way we do things and on many aspects of our society. This includes the usage of websites in universities. The usage of the internet within Universities has increased in this few years. More formal interactions are done through the Universities websites or portals. This may include official announcements, registrations, and many other processes that require physical interactions before this. Now most of the information can be accessed through the website

Al-Khalifa (2014), mentioned that universities' websites are portals that provide services and information to their visitors. Websites are designed to provide content and services that serve different stakeholders' needs, including students, faculty, researchers and alumni. Prospective students can seek information about admission issues, current students can enquire about their results or register for new courses, staff can follow the university's latest news and alumni can seek announcements regarding job openings. This shows that the website is becoming like a hub for various services and information further emphasizing the importance of the website. Due to the increased use of the universities website, it has

E-ISSN: 2289-1528
https://doi.org/10.17576/JKMJC-2017-3304-12

resulted in the importance of proper web design to ensure that the universities have an effective website. Nielsen (2003), mentioned that the website served as the first line of interaction between the organization (universities) and the patrons. Due to this, a proper website design is vital in order to reflect the image of the organization (universities). According to Kuthoos, Noor, Hashim, and Siarap (2014), it is important for a university to have a positive image because it will strengthen the brand of the university. Having a well-designed website is one way to portray the strong image brand towards the public.

The increased usage of website due to the various functions that can be done through it (Al-Khalifa, 2014), will result in new development in improving the function thus creating new challenges in the website design process. One of the challenges in designing websites is ensuring that the website is usable. However, usability is not something that can be looked at as a separate entity in ensuring a proper website design. Most researches that are done regarding effective website design focuses on usability rather than the aesthetic elements. Reinecke et al. (2013) stated that designers and researchers alike assumed that usability was the main reason for active involvement with a website. Reinecke et al. (2013) further explained that it is now known that initial aesthetic response to websites which refers to the spontaneous emotional reaction based on visual preferences, heavily influences whether users later perceive the websites as usable. Websites that are perceived as beautiful are also perceived as usable. Website design can not only focus on usability aspects because the aesthetics elements also play an important role. According to Liu and Arnett (2013), the aesthetic elements of the webpages used to reflect the quality of webpages' visual appearance may be a key influential factor of users' experience and satisfaction to a website. Due to this, both usability and aesthetic elements of a website must be properly considered during the design process.

To further understand website usability and website aesthetics, the importance of both element (usability and aesthetic) to the overall website performance must be understood especially from the perspective of an academic website. This paper conducts the review of existing research regarding balancing web usability and web aesthetic through systematic literature review (SLR). This paper gathers the area of study regarding overall description of a quality website, importance of website usability, web usability measurement, importance of website aesthetics, web aesthetic measurements and to know whether there is research regarding relationship between web usability and web aesthetics.

Web Usability

According to Pearson, Pearson, and Green (2007), web usability can be defined as making the design simple enough so that customers, who by nature tend to be goal-driven, can accomplish their task as quickly and painlessly as possible. This is further explained by Yates (2005), that by addressing the critical usability elements of the design process, most specifically the site navigation architecture, and ensuring that it is intuitive and consistent with usability feedback received, users are easily able to move around the site and are better able to focus on the content. According to Abdulrauf (2015), usability is the basic factor to consider when developing any software which includes websites. How usable the website is the main objective of web designers. Researchers have considered usability as a fundamental part to determine the quality of a website and it has become an important process to enhance the product usability. From the perspective of an academic website, a usable website will ensure that the functions provided by the university online can be utilized by the users. Due to the nature that most university websites use the website as the

medium for a faster dissemination of information and also services, it is important that usability is one of the key concerns in the design. Without usability, a website will not be the medium of choice thus making the website a waste. This is in line with the research by McKinney, Yoon, and Zahedi (2002) where they mentioned that a web site will be abandoned if the consumer has difficulty searching or retrieving their needed information, even if the web site provides the information necessary to complete the intended task. However, usability is not an easy element to be incorporated into a website design process. According to Pearson et al. (2007), usability is more like a balancing act. Insufficient functionality will make the application (website) useless while the complexity and clutter make an interface difficult to use.

Web Aesthetics

Another important aspect in website quality is website aesthetics. According to Yusof, Khaw, Ch'ng, and Neow (2010), aesthetics is regard to interface design. This may include graphics, text and animations. In other words, web aesthetics are visual aspects that users see on the website which may intrigue their emotions or interest. This is further described by Reinecke and Gajos (2014), where they mentioned aesthetics have been recognized as important because of their positive influence on people's behaviour, such as on performance under conditions of poor usability, or on purchase intentions. Pleasing visuals are important because they create first impressions which result in a desire to explore further. This is in line with the statement by Lin, Yeh, and Wei (2013), where it is mentioned that first impression of the web page as perceived by the users is an important issue for web designers. It can influence users' actions. This is where visual aesthetics play an important role. Web aesthetics are generally seen as visual aesthetics within a website where it is mainly used for attraction purposes. This is further described by Reinecke and Gajos (2014), where they mentioned aesthetics have been recognized as important because of their positive influence on people's behaviour, such as on performance under conditions of poor usability, or on purchase intentions. Yong, Jantan, Abdullah, and Kamaruddin (2015) in their research described web aesthetics includes colour, fonts, graphic, image, layout structure, texture and typography.

Balancing Web Usability and Web Aesthetics

Balancing web usability and web aesthetics has been seen as the oldest question in web design field. The need of balancing website usability and aesthetic elements has gained much attention. It has been described that both usability and aesthetic elements plays important roles in determining website quality. According to Kim, Koo, Yoon, and Cho (2016), the question of which one of aesthetics or usability is more influential or which one is temporally evaluated before one another remains controversial. Kim et al. (2016) further described that studies that emphasized aesthetics as the most important factor claimed that there are correlations between perceived aesthetic ratings of a user interface and overall user satisfaction. Norman (2005), pointed at the emotional impact of good design by arguing that aesthetic design can exceed usability in the overall experience of the user.

However, according to Tuch, Roth, HornbæK, Opwis, and Bargas-Avila (2012), they found that aesthetics of an interface did not influence perceived usability and instead, usability had an effect on the perceived aesthetics after usage.

This contradiction shows the need to identify a clear method of balancing both usability and aesthetic elements. Yusof et al. (2010) indicated that there is no ideal solution in deciding which aspect to focus on, either usability or aesthetic appeal in designing a Website. This is due to its difficulty to adapt to these two seemingly contrary objectives of a Web site design at the same time.

From the perspective of the design of a university website, this also seems to be the question. Both usability and web aesthetics have been shown to have certain importance towards building a proper website. It is important that the web designers understand the need of incorporating both usability and appealing web aesthetics in the design of the website. However, there is lack of literature that provide a clear guideline in ensuring that the website is balanced in both usability and aesthetic elements. Due to the importance of usability and aesthetic elements, it is important that web designers ensure that the design balances both aspects. One way of doing so is by identifying a new set of attributes that measure web usability based on the web aesthetic used in the web design process. By doing so, web designers will be able to measure whether the aesthetic elements used on the website will contribute to a better web usability.

In identifying the new attributes, SLR is conducted to further analyse the previous researches that discussed issues regarding both web usability and web aesthetics especially in term of the measurement of both aspects.

METHODOLOGY

The research method section discusses about the steps involved during the process of SLR. Based on the SLR method by Kitchenham (2004), SLR study the circumstances in the previous studies, in which the data was gathered from the journals, articles, and other academic materials. In other words, SLR are secondary studies, while the studies of individual that contribute to the SLR are considered as the primary studies. According to Kitchenham (2004), the objective of SLR is (i) to summarize the existing evidence concerning technology, (ii) to identify the gaps in in current research in order to suggest areas for further investigation and (iii) to provide a framework or background in order to appropriately position new research activities. Based on the objectives of doing SLR by Kitchenham (2004), the purpose of using SLR in this study is to gather the area of study regarding overall description of a quality website, the importance of website usability, web usability measurement, the importance website aesthetics, web aesthetic measurements, to know whether there are researches regarding relationship between web usability and web aesthetics, and to gather the appropriate method to measure web usability based on the aesthetic design of the website.

The SLR consist of three stages which are planning the review, conducting the review and reporting the review. Planning the review is the process where the SLR research questions are identified, followed by conducting the review that discussed on how the researcher conduct the search for papers and journals in online library. The inclusion and exclusion criteria are also included in this stage where it discussed about the filtering process for the searched papers and journals. Finally, reporting the result explained the result of the SLR research.

Planning the Review

This step requires research questions to be constructed in order to identify the literatures needed for the SLR. The research questions as in Table 1 are used as guidelines for the search strategy in conducting the review.

Table 1: Research Question for SLR

No	Research Questions
RQ1.	What are the key quality factors for a website?
RQ2.	What are the importance of web usability?
RQ3.	How to evaluate web usability?
RQ 4.	What are the importance of web aesthetics?
RQ 5.	How to evaluate web aesthetics?
RQ 6.	What are the relationship between web usability and web aesthetics?
RQ 7.	Are there any theories or models to measure web usability based on the aesthetics of a website?

Conducting the Review

The step to conduct the review consists of two different parts. The first part is search strategy, while the second part is the inclusion and exclusion criteria.

Search Strategies

The search strategy is where the researcher constructs the search string for searching the relevant paper. The search string will be based from the SLR research questions. The search string for the SLR are “Web usability” OR “Web aesthetics” OR “Web usability measurement” OR “Web aesthetics measurement”. The papers that are retrieved based from these search strings will be filtered in the inclusion and exclusion part. Table 2 shows the result of the search strategy from four digital libraries.

Table 2: Digital Libraries Used in SLR

Digital Libraries	Address	Mapping Date	Results
IEEE	http://ieexplore.ieee.org	February 2016-May 2017	143
ACM	http://dl.acm.org	February 2016-May 2017	60
Science Direct	http://www.sciencedirect.com	February 2016-May 2017	211
Emerald Insight	http://www.emeraldinsight.com	February 2016-May 2017	244
	Total Articles		**658**

Inclusion and Exclusion

The inclusion and exclusion part was conducted in order to ensure only relevant papers are selected for the study purposes. All the papers obtained from the search process were reviewed and revised based on their title, abstract, literature, methodology and conclusion. The papers that are not relevant or related with this study were excluded from the list. For example, most of the digital libraries also show the results that contained the term of “web” thus making most of the articles unrelated to the specific search of "web usability" and "web aesthetics” keyword. Hence, the papers that are not related to web usability and web aesthetics need to be excluded. The inclusion and exclusion criteria are as follows:

Inclusion Criteria

The inclusion criteria are used to determine which literature that comprises of journals, papers, and technical reports that were found from the search string would be used in the research. The papers that are related to the web design, web usability and web aesthetics

and written in English only are being considered by the researcher. The other criteria are listed below:

- Studies that relevant to the research questions.
- Studies that describe the importance of web usability and web aesthetics.
- Studies that describe the relationship between web usability and web aesthetics.
- Studies that describe the theories and models for web usability measurement.
- Studies in the range of 2007 – 2017

Exclusion Criteria

The exclusion criteria are the opposite of the inclusion criteria where the exclusion criteria will be used to determine which literature review will be excluded from the research. The criteria are listed below:

- Studies that not relevant to the research questions.
- Studies that do not describe web usability and web aesthetics.
- Studies that do not describe the relationship between web usability and web aesthetics.
- Studies other than web usability and web aesthetics.

The Table 3 below shows the final number of chosen paper that are relevant to this study according to the inclusion and exclusion criteria which described previously. The total number of final chosen paper is 78.

Table 3: Final Paper for Review

Journals	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
IEEE	2	1		1					3	2
ACM	1	4	1	1	1	3	2	2	3	6
Science Direct					1	3	8	1		2
Emerald Insight	3	2	4	2	3	4	6	5		1
Total	**6**	**7**	**5**	**4**	**5**	**10**	**16**	**8**	**6**	**11**

Results

Based from the searched results, the papers that were considered by the researcher are based from the discussions of the abstract, overview, challenges, analysis, dimensions, and perspectives regarding web usability and web aesthetics and also the measurement theories and models.

Table 4: described the number of researches that answers the SLR research questions.

SLR Research Questions	**Number of Articles**
What are the key quality factors for a website?	7
What are the importance of web usability?	9
How to evaluate web usability?	14
What are the importance of web aesthetics?	11
How to evaluate web aesthetics?	6
What are the relationship between web usability and web aesthetics?	5
Are there any theories or models to measure web usability based on the web aesthetics of a website?	5

Based on the SLR, the research questions can be answered through the literatures. However, there is a lack of researches regarding web usability measurements based on the web aesthetics used in the website. Most of the web usability measurement is based on several criteria such as content and organization of information. There is no model that measure usability only based on the aesthetic design of the web.
Also, there is also lacked of researches that uses public university websites as their scope of research. Most of the researches from the SLR focuses more on commercial websites.

DISCUSSION

Based on Table 4, there are several researches that answer the research question. This section will discuss the findings from the researches that described the research question.

For RQ1, 7 researches described the key quality factors for a website. In a research by Cox and Dale (2002), a model was developed to describe key quality factors for a quality website. In this model, the key quality factors are categorized into four categories which are (i) ease of use, (ii) customer confidence, (iii) online resources, and (iv) relationship services. Within the ease of use category, it described all the design criteria of a website that regards to usability to ensure that the website navigation is easy and reduce users' frustration. This category described the design of the website must portray two functions of a website which are communication and navigation. In terms of communication, Cox and Dale (2002) described that communication with the users must be enabled through the usage of text, graphics and animations. The navigation of the website on the other hand should be enabled through the use of links and searches. All these criteria are to ensure usability of a website through its design. From this model, it is shown that the design of the website which include the usage of aesthetic elements (graphic and animations) must prioritize usability. This is in line with the study by Flavian, Gurrea, and Orús (2009) where it is mentioned that the usage of aesthetic elements must also ensure usability. Based on the model by Cox and Dale (2002), it can be seen that in determining the quality of a website especially in term of ease of use (usability), aesthetics play an important role. The usage of text, graphics and animations which all are in line with the description of the aesthetic elements of Yong et al. (2015) where it is described that aesthetic elements includes colour, font, graphic, image, layout, structure, texture and typography. The usage of all these elements in a website must enhance the usability of the website in order for the website to be considered as a quality website. Although this model focuses on commercial websites, in a public university website, both communication and navigation is also part of the function needed by the university website thus making it relatable to the design process of a university website. From these researches, it can be seen that usability is only one part of the key criteria for the overall quality of the website and the usage aesthetic elements is a part of usability.

In RQ2, the need to identify the importance of web usability is vital to point out the need to incorporate web usability in the web design process. From the SLR, 9 researches are identified that discussed the importance of web usability. Three major importance of web usability is identified which have improved web navigation, improve web access and improve users' trust. Yates (2005) and S. Roy, Pattnaik, and Mall (2014) both mentioned that academic websites (University websites) are meant to provide information to a wide variety of users. Users of educational website are mostly concerned with two major points which are finding the information being sought with ease and finding it in a timely fashion. This requires achieving high levels of usability especially in term of navigation. Users should be

given "control" of the navigation, achievable through the implementation of simple, traditional design layouts. In term of improving access, Yates (2005) described that usability primary concern is establishing a web environment by providing access to all users, and also seek to heighten awareness of the online "experience" for both user and developer. In pursuit of enhanced site usability, this close relationship should be driven primarily by the web development custodians, whose ownership of the agenda is pivotal in ensuring that the site maintains a high level of accessibility. Lastly, in term of improving users' trust. Researches by M. C. Roy, Dewit and Aubert (2001) and Fisher, Burstein, Lynch and Lazarenko (2008) have identified that web usability influenced users' trust. A website with high usability will influence users' trust in a positive manner. The user assumes that the more usable the website is, the more trust can be given towards the content of the website. The findings can be relatable to a university website due to both commercial websites (M. C. Roy et al., 2001) and health information website (Fisher et al., 2008) that are different in the nature of business; indicated that usability influenced users' trust. The similarities of a commercial website, a health information website and a university website is that all websites provide information and services to users. Thus, the similarities in the findings can be a consideration in the design process of a university website.

Based on RQ3, in measuring web usability, there are several methods in doing so. According to M. C. Roy et al. (2001), five factors are evaluated to measure the usability. These five factors are chosen because it is most relevant to first time users of a website and were easier to evaluate after a few minutes of use and applicable to the Web environment. The five factors include ease of navigation, consistency, learnability, perceptual limitation and user guidance. These factors were also used by Fisher et al. (2008) to evaluate websites in their research focusing on health information websites in Australia.

There are also other studies that used different methods to measure usability. Okene and Enukpere (2011), in their research used two online automated tools which are HTML Toolbox and Web Page Analyzer along with a questionnaire to measure usability.

Manzoor and Hussain (2012) in their research came out with a model to evaluate academic websites (Website Usability Evaluation Model). The model consists of 17 measures which were divided into five feature categories which are website contents, webpage design, navigation, page design layout and accessibility.

Kostaras and Xenos (2007) employed Heuristic evaluation for usability assessment of Hellenic Open University website. The evaluation was conducted in two phases by usability experts. In the first phase, the evaluators were encouraged to navigate through the application to get a feel of the system. In the second phase, evaluators validated the implementation of each Heuristic rule derived by Nielsen.

Another usability evaluation method was proposed by Daher and Elkabani (2012). The research used a qualitative study on usability of web portals in six Lebanese universities and Beirut Arab University (BAU) web portal. In the research, it consists of two parts in evaluating usability. During the first part of the study, the researchers distributed questionnaires among students of six Lebanese Universities to gain an overview of the usability problems encountered. The questionnaire study measured nine common services on the web portals of the universities. The researchers performed a comparative study of the usability of the common services available on the university web portals based on the results of the questionnaire. In the second part of the study, both qualitative and quantitative evaluations of usability of the BAU web portal were performed. The students, faculty members and employees at BAU participated in the study. The researchers

performed a qualitative study by distributing a questionnaire among the participants. As part of the quantitative study, participants were asked to perform specific tasks while being videotaped, to gather performance data including the time on task, webpage changes and the mouse clicks. After completing the tasks and filling the post-task questionnaire, the Six Sigma method was used to calculate the effectiveness, efficiency and satisfaction usability metrics. These usability metrics were then standardized to calculate the SUM usability metric to summarize the usability of the overall web portal services.

Mentes and Turan (2012) proposed another method to evaluate web usability. In their research, they used WAMMI (Website Analysis and Measurement Inventory) to measure the usability of the Namik Kemal University (NKU) website which 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.

As seen in previous studies, website usability evaluation can be done in various methods whether it is qualitative, quantitative or a mixed of both. Most of the methods used different aspects to evaluate but at the same time share similar attributes. This is supported by Petrie and Bevan (2009), where it was mentioned that usability evaluation methods are differently classified, but often overlapped. A usability evaluation depends on the choice and planning of one or more usability evaluation methods, and based on factors of life cycle stages of the application development.

Based on RQ4, there are several researches that discussed the importance of web aesthetics. From previous research, there are three main importance of web aesthetics which include, improving first impressions on web design, affecting users' perception and influencing web credibility. In term of improving first impressions of web design, Lin et al. (2013), and Kim et al. (2016) described that users from the first impression about an interface design in just a few seconds and quickly decide on whether to stay on or leave the interface. Based on this, it can be seen that visual aesthetics can improve users' first impressions and subsequently influence users' actions. If the first impressions are positive, then user experience will also be positive. A study by Kim et al. (2016), found that when evaluating an interface design, within less than 1000ms time periods, users' judgment about usability and aesthetics are completed based on the first impression of the design. This shows that first impression not only influence users' action but at the same time influence users' perceived usability of the website. Again, this shows the relationship between usability and aesthetics. In term of affecting users' perception, Garzotto, Sorce, Bolchini, and Yang (2010), Kim et al. (2016) and Yusof et al. (2010) described, users likely to perceive a website to be usable when it is pleasing in term of visual aesthetics. It is identified that perceived usability is in correlation with perceived visual aesthetics. Finally, in term of influencing web credibility, Brian J Fogg (2003), and Benjamin J Fogg et al. (2002), described what elements in the visual aesthetics influenced website credibility. The finding of the researches indicated that "Unity" of visual aesthetics are the main factors that influenced website credibility. Alsudani and Casey (2009), indicated that home pages that achieve 'Unity' in their design are considered to be more credible than others that lack 'Unity' in their design. According to Wahab and Rahim (2013), media credibility affect audience participation in its usage. This is in line with the usage of websites. The more users perceive the website to be credible, the more users will likely to use the website.

In answering RQ5, there are several researches found that discussed the issue. Researches by Yusof et al. (2010), Hartmann, Sutcliffe, and Angeli (2007), Reinecke et al.

(2013), Reinecke and Gajos (2014), Michailidou, Harper, and Bechhofer (2008), Harper, Michailidou, and Stevens (2009), Purchase, Hamer, Jamieson, and Ryan (2011), and Ivory, Sinha, and Hearst (2001), have designed methods to measure web aesthetics using various methods. Based on these previous researches, it can be seen that there are various methods used to evaluate web aesthetics. However, all of the researchers concluded that web aesthetics cannot be measured 100% accurately. The assessment of web aesthetic is complex. This is in line with the statement, first made by Yusof et al. (2010) where he argues that there is no accurate measurement for aesthetic elements. It is too subjective to answer whether the Website has high quality of aesthetics. Even though this is the case, it is still important that the web aesthetics to be evaluated because it has been seen that web aesthetics is one of the elements in ensuring website quality.

In reference to RQ6, there are several researches that discussed about the relationship between web usability and web aesthetics. A finding by Kim et al. (2016) described that studies that emphasized aesthetics as the most important factor claimed that there are correlations between perceived aesthetic ratings of a user interface and overall user satisfaction. However, there is no specific discussion on which dimension of aesthetic that influence the web usability. On the other hand, Norman (2005) pointed at the emotional impact of good design by arguing that aesthetic design can exceed usability in the overall experience of the user. However, according to Tuch et al. (2012), they found that aesthetics of an interface did not influence perceived usability and instead, usability had an effect on the perceived aesthetics after usage. This contradiction in findings indicates that web aesthetics and web usability are related to one another either one influencing the other or the way around. Based on most literatures, there is a relationship between aesthetics and usability.

Finally, in terms of RQ7, there are no researches that directly described on how to measure web usability based on the aesthetic design of a website. However, there are researches that described theories and models in measuring web usability in general. This includes User Experience Model by Huang and Wang (2009), Voluntary Product Accessibility Template (VPAT) by Wakimoto and Soules (2011), Web Design Perspective (WDP) by Yusof et al. (2010), Barrier-free Evaluation Model by Sun and Wen (2008) and SCANMIC Model by Hassan and Li (2001). All these theories and models described how to measure web usability as a whole but does not described how to measure usability based on the aesthetic of the website. However, there are several attributes that are described in the theories and model that are directly influenced by web aesthetics. This includes, learnability, readability, use of multimedia, ease of navigation and loading speed. These attributes can be used to develop a new measurement to measure web usability based on the web aesthetics.

CONCLUSION

The researcher performed SLR to study about the relationship between web usability and web aesthetics and how to balance the two elements. Through the SLR, both web usability and web aesthetics have their own contribution to the overall quality of the website. Due to this, both web usability and web aesthetics should be incorporated in the web design process. The researcher suggested that in order to achieve balance in term of web usability and web aesthetics, a new measurement must be developed that can measure web usability based on the aesthetics used in the website. This is important to ensure that the web aesthetics used can be measured in term of its usability.

However, based on the SLR that have been conducted, there is no researches that described on how to measure web usability based on web aesthetics. On the other hand, there are various models and theories that described web usability in general. By looking at these models and theories, there are several attributes that are discovered that are directly influenced by web aesthetics. These attributes can be used in future researches to develop new measurement to measure web usability based on web aesthetics. By doing so, it may help in providing a method in balancing web usability and web aesthetics.

ACKNOWLEDGEMENT

The researcher would like to thank the School of Computing, Universiti Utara Malaysia for the support in doing this research.

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