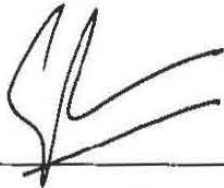


SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Doctor of Philosophy (Computer Science).



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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.



(Student's Signature)

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Date : 15.1.2019


THE EXTENSION OF WEBSITE USABILITY MODEL AND
ITS EVALUATION CRITERIA FOR MALAYSIA HIGHER EDUCATION
INSTITUTION

NUR SUKINAH BINTI AZIZ

Thesis submitted in fulfillment of the requirements
for the award of the degree of
Doctor of Philosophy (Computer Science)

Faculty of Computer Systems & Software Engineering
UNIVERSITI MALAYSIA PAHANG

JANUARY 2019

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|--|---------------------------------------|
| PERPUSTAKAAN  | |
| UNIVERSITI MALAYSIA PAHANG | |
| No. Perolehan 127365 | No. Panggilan FSKKP 555 2019 |
| Tarikh 17 APR 2019 | Thesis |

ACKNOWLEDGEMENTS

In the Name of Allah, the Most Gracious and the Most Merciful.

First and foremost, I am grateful to Allah S.W.T for enabling me to complete this PhD journey. This thesis is possible because of the support of many individuals in a number of ways. It is a pleasure to convey my gratitude to them in my humble acknowledgment. The dissertation process is a time consuming undertaking, which required dedication, sacrifice and support. It would not have been possible to be written without the help and support of the kind people around me. This thesis would not be finished without any of their assistance and support.

In the first place I would like to express my gratitude to my supervisor, Dr. Adzhar Kamaludin who showed persistent confidence in me and provided me the guidance and unflinching support and encouragement. Thank you Dr Adzhar for always supporting and pushing me to work hard and be on time. I am grateful to Dr. Hasiah Binti Mohamed@Omar (UiTM Dungun), Prof. Ramayah Thurasamy (USM), Assoc. Prof. Dr. Mohd Rashid Bin Ab Hamid (UMP) and Dr. Abdul Hafaz Bin Ngah (UMT) for their encouragement during this research. I am constantly amazed at their knowledge and their willingness to share their time and expertise. I owe them more than I can adequately express and offer them my warmest appreciation and deepest thanks.

Most importantly, my sincere appreciation goes to my beloved husband, Muhamad Sukri Bin Ab. Mutalib, for his support, encouragement and patience. He has always been there whenever I need support. I could certainly not have completed this journey without him. To my adorable children, Haris and Syahmi, all of you kept me from taking PhD too seriously. The two of you have been the motivational force for me to get through this journey. Both of you were born during the PhD journey.

I would especially like to thank my family members especially my parents, Abah (Haji Aziz Ismail) and Mama (Hajjah Rosni Abdullah) who have always encouraged and supported me. They have given me the strength to study and supported me at every step of the way. I would like to thank Along (Nur Kamilah Aziz), Angah (Nurul Hidayah Aziz), Anyah (Nur Arbaayah Aziz), Udin (Muhammad Nurrudin Aziz) and Adeq (Nurul Hafizah Aziz) for all the support and prayers. I also dedicate this to my youngest sister, Adeq because you inspired me alot along this journey. Your courage and determination to achieve the achievement along with your study even though you are fighting your cancer. When I felt so demotivated and stressed, I will remind myself, if you can achieve success through the obstacles, so can I. I would like to thank my parents-in-law who took the extra burden of taking care of my children when I needed to go outstation. Thank you and I love you all.

I am grateful to TATI University College (TATIUC) for funding my PhD study that gave me the opportunity to embark on this journey. Acknowledgement also goes to all who helped me during the data collection and to the respondents of this research. Finally, I would like to thank everybody who was important to the successful realization of this thesis, and express my apology for those whom I could not mention personally.

DEDICATION

With love and respect

Haji Aziz Bin Haji Ismail

Hajjah Rosni Binti Abdullah

Muhamad Sukri Bin Ab.Mutalib

Muhammad Syafi Haris Bin Muhamad Sukri

Muhammad Syafi Syahmi Bin Muhamad Sukri

**DEDICATED TO MY PARENTS, MY HUSBAND, MY CHILDREN AND ALL MY
FAMILY MEMBERS**

ABSTRAK

Kajian kebolehgunaan laman web adalah bidang yang berterusan berkembang. Bidang penyelidikan kebolehgunaan laman web ini telah menarik ramai penyelidik berdasarkan beberapa sebab seperti untuk melihat tahap kemampuan dan sejauh mana had yang ia mampu tawarkan. Walaupun terdapat banyak kajian berkenaan laman web, ia telah menimbulkan tidak konsisten disebabkan banyak aspek yang ditawarkan daripada penyelidik. Terdapat kekurangan kajian kebolehgunaan laman web yang melibatkan laman web institusi pengajian tinggi. Ia juga kurang kajian yang menjadikan kebolehgunaan sebagai tahap kedua dan kepuasan sebagai pengantara yang fokus pada laman web institusi pengajian tinggi. Terdapat kekurangan dalam kajian atribut kebolehgunaan yang melibatkan isian, navigasi, kebolehpembelajaran, kebolehcapaian, reka bentuk antara muka dan kepuasan dalam menilai laman web institusi pengajian tinggi. Dalam pengertian ini, penting untuk mengenalpasti konstruk apabila menilai kebolehgunaan laman web institut pengajian tinggi agar dapat merangka garis panduan kegunaan yang baik yang menyokong instrumen pengukuran dan menghasilkan hasil yang lebih baik. Penyelidikan ini dijalankan untuk mencadangkan model kebolehgunaan laman web yang mempunyai unsur pengantara dan tahap kedua dalam model. Kajian ini dijalankan untuk untuk penilaian laman web; keberkesanan, kecekapan, kebolehcapaian, kebolehpembelajaran, kepuasan, navigasi, isian, reka bentuk antara muka dan ingin menggunakan. Kaedah kajian yang digunakan adalah kaedah campuran yang melibatkan pendekatan kualitatif dan kuantitatif. Temu bual dengan pakar dilakukan untuk mendapatkan pandangan yang lebih baik mengenai model dan konstruk dalam kajian. Beberapa teknik pengumpulan maklumat juga telah digunakan untuk menilai model tersebut seperti pandangan daripada pakar, ujian pra dan ujian perintis digunakan untuk penilaian instrumen sebelum digunakan di dalam kajian sebenar. Instrumen kebolehgunaan laman web yang terakhir iaitu Questionnaire Website Usability (QWU) yang mempunyai 9 konstruk dan 45 item di dalam instrumen untuk menilai laman web dan mengesahkan model kebolehgunaan laman web diperkukuhkan melalui satu kajian yang dijalankan terhadap 654 orang responden. Pendekatan data yang dianalisis menggunakan Partial Least Square – Structural Equation Modeling (PLS-SEM). Kajian ini mendapati kebolehgunaan mempunyai hubungan yang signifikansi dengan kepuasan. Dalam pada masa yang sama, kepuasan juga berkait rapat dengan dengan niat penggunaan. Kajian ini juga mendapati pengukuran model untuk kebolehgunaan sebagai tahap kedua menunjukkan kesemua syarat untuk memenuhi pengukuran model telah dicapai. Kajian ini turut menunjukkan kepuasan adalah pengantara kebolehgunaan laman web dengan niat penggunaan. Keputusan yang dihasilkan menyumbang kepada pengetahuan dalam bidang kebolehgunaan laman web. Ini menunjukkan bahawa kepuasan sebagai pengantara memainkan peranan yang penting dalam model kebolehgunaan laman web. Ini telah digambarkan daripada persepsi pengguna ke atas laman web yang mereka gunakan. Atribut kebolehgunaan laman web sebagai tahap kedua menjadikan model tersebut lebih mudah dan mengurangkan kekompleksan model itu. Dalam model yang ditambahbaik tersebut turut menyumbang kepada perkembangan tambahan sambungan-sambungan teoretikal iaitu antara atribut kebolehgunaan, kepuasan, dengan niat penggunaan. Sebagai kesimpulan, kesemua 9 konstruk dan 45 item dalam model kebolehgunaan laman web telah dikenalpasti dan disahkan sebagai ciri-ciri utama untuk digunakan dalam menilai kebolehgunaan laman web. Penemuan ini dapat digunakan oleh pembangun dan agensi kerajaan dalam meningkatkan kebolehgunaan laman web.

ABSTRACT

Website usability research is a consistently developing field. It has attracted many researchers based on their capabilities and constraints that are available for website usability. Even though there are many research about website usability, it devours the cause of inconsistency due to many websites usability aspects that offered by the researchers. There are lacks of research on website usability that focused on higher education institution website. It comprises the usability as the second order and satisfaction as mediator as well as the use of usability attributes such as content, navigation, learnability, accessibility, interface design and satisfaction to measure the higher education institution websites. In this sense, it is important to identify the constructs when assessing the higher education institution website usability in order to be able to design decent usability guidelines that support the measurement instrument and hence generate better results. The research is carried out to propose the extension of website usability model that has element of mediator and second order in the model. There are few constructs that are identified to evaluate the website usability such as effectiveness, efficiency, accessibility, learnability, satisfaction, navigability, content, interface design and intention to use. A mixed method that included qualitative and quantitative approach were used in this study. Interview with experts are conducted to obtain a better view about the model and construct in the research. Then, the instrument is needed to undergo content validity examination by experts, pre-test and pilot test to be utilized for assessment of the instrument. The final instrument of website usability, namely the Questionnaire Website Usability (QWU) that have 9 constructs and 45 items of questionnaire to evaluate the website and validate the extension website usability model were strengthened through a study conducted on 654 respondents. The data analysis using Partial Least Square – Structural Equation Modeling (PLS-SEM) to test the relationship between constructs in this research. The research has found that the usability has a significant relationship with satisfaction and in turn, satisfaction has a significant relationship to the intention to use. Based on the measurement model for usability as second order shows that all requirements are fulfilled and significant. The findings have also discovered that the satisfaction is mediated between usability and intention to use. The finding contributes to the knowledge in the field of website usability. It has demonstrated that satisfaction as a mediator plays a vital role in a website usability model. This has been shown by the user perception on the website that they have used. The website usability attributes as a second order makes the model simpler and reduces the complexity of the model. The extension model contributes to the development of additional theoretical linkages which is between usability construct, satisfaction and intention to use. In conclusion, the total of 9 constructs and 45 items of the website usability model are identified and validated as the main attributes to be used in evaluating website usability. The findings of this research also could be used by website developer and government agencies to develop a better plan to enhance the website usability.

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LIST OF ABBREVIATIONS

| | |
|-----------|---|
| A | Accessibility |
| ASQ | After Scenario Questionnaire |
| AVE | Average variance extracted |
| AWU | Attributes Website Usability |
| B2B | Business to business |
| B2C | Business to customer |
| C | Content |
| C2C | Customer to customer |
| CFA | Confirmatory factor analysis |
| CMV | Common method variance |
| CR | Composite reliability |
| CSS | Cascading Style Sheets |
| D&M model | Delone & Mclean model |
| DV | Dependent variable |
| EV | Effectiveness |
| EWUM | Extension of Website Usability Model |
| EY | Efficiency |
| HCI | Human Computer Interaction |
| HCM | Hierarchical Component Models |
| HEI | Higher education institution |
| HOC | Higher order construct |
| ID | Interface design |
| IS | Information System |
| ISO | International Organization for Standardization |
| ITU | Intention to use |
| IV | Independent variable |
| L | Learnability |
| LL | Lower interval |
| LOC | Lower order construct |
| MAMPU | Malaysian Administrative Modernisation and Management Planning Unit |

| | |
|----------|--|
| MDeC | Multimedia Development Corporation |
| MGPWA | Malaysia Government Portals and Websites Assessments |
| MUG | Microsoft Usability Guidelines |
| N | Navigation |
| PLS | Partial Least Squares |
| ProBE | Provider-Based Evaluation |
| QUIM | Quality in Use Integrated Measurement |
| QWU | Questionnaire Website Usability |
| S | Satisfaction |
| SD | Standard deviation |
| SEM | Structural Equation Modeling |
| SPSS | Software for Statistical Analysis |
| SSA | Sub-Saharan Africa |
| UL | Upper interval |
| VIF | Variance inflation factor |
| W3C | World Wide Web Consortium |
| WCAG 2.0 | Web Content Accessibility Guidelines 2.0 |
| WU | Website usability |
| WUM | Website usability model |
| WWW | World Wide Web |

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