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JUDUL: ENHANCEMENT OF THE TOUR GUIDE WEBPAGE FOR KINTA TOUR GUIDE WEBPAGE BASED ON HUMAN COMPUTER INTERACTION (HCI) ELEMENTS BY JACOB NIELSEN

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ENHANCEMENT OF THE TOUR GUIDE WEBPAGE FOR KINTA TOUR GUIDE WEBPAGE BASED ON HUMAN COMPUTER INTERACTION (HCI) ELEMENTS BY JACOB NIELSEN

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JUNE 2012

DECLARATION

I declare that this thesis entitled "Enhancement of the Tour Guide Webpage for Kinta Tour Guide Webpage Based on Human Computer Interaction (HCI) Elements by Jacob Nielsen" is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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SUPERVISOR'S DECLARATION

"I hereby declare that I have checked this project report and in my opinion this project is satisfactory in terms of scope and quality for the award of the degree of Bachelor of Computer Sciences (Software Engineering)".

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Special dedication to my family members,
My friends, my fellow colleague
and all faculty members

For all of your support and belief in me

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ABSTRACT

Webpages are the pages which are available online and this is the site where Internet users can get a wide range of information from. Webpages can be divided into various types such as advertisements, articles, guidelines and so on. Webpage for tour guide is one of the significant and useful pages available online. Different types of webpages have different goals and information. However, there are many existing webpages that require enhancement to be more convenience, informative and attractive to the Internet users. This project is done in order to enhance the tourism webpage of Kinta Tour Guide Webpage. The Heuristic Usability rules of Human Computer Interaction (HCI) are utilized for the Kinta Tour Guide webpage enhancement. The effectiveness of the project is verified by bringing out random survey with questionnaire. It is the Research Methodology process. Then, it has been identified that the Kinta Tour Guide webpage is lack of information, creativity and so on. The existing system of the webpage has been surveyed by 30 respondents and their comments from the questionnaire are considered seriously to be applied in order to enhance the webpage based on the Heuristic Rules. Most of the respondents are unsatisfied with the unattractive design and boring contents of the existing system. There are three main Heuristic Usability Rules available which include 8 Golden Rules, Norman's Principle and the Jacob Nielsen's Rules. In the project of Enhancement of the Tour Guide Webpage for Kinta Tour Guide Webpage Based on Human Computer Interaction (HCI) Elements by Jacob Nielsen, the most suitable rule to be applied is the Jacob Nielsen's Heuristic Rules. Hence with the suitable Heuristic rules and useful comments from the survey, the enhanced webpage can fulfil all of the requirements from the viewers.

ABSTRAK

Laman web adalah halaman yang boleh didapati dalam Internet dan ia adalah tempat di mana pengguna Internet boleh mendapatkan pelbagai maklumat. Laman web boleh dibahagikan kepada pelbagai jenis seperti halaman untuk iklan, artikel, garis panduan dan sebagainya. Laman web untuk panduan pelancong adalah salah satu laman web yang penting dan berguna pengguna Internet. Setiap jenis laman web mempunyai matlamat yang berbeza dan maklumat. Walau bagaimanapun, terdapat banyak laman web yang sedia ada yang masih memerlukan pengubahsuaian dan peningkatan untuk menjadi lebih mesra pengguna, bermaklumat dan menarik kepada pengguna Internet. Projek ini dilaksanakan dalam usaha untuk meningkatkan laman web pelancongan Panduan Pelancongan Kinta. Kaedah-kaedah kebolehgunaan Interaksi Heuristik Manusia dan Komputer (HCI) digunakan untuk pembangunan laman web Tour Panduan Kinta. Keberkesanan projek ini dibuktikan dengan pelaksanaan kajian rawak serta soal selidik. Ia adalah satu proses Kaedah Penyelidikan. Selepas itu dengan keputusan dari kajian yang telah dilaksanakan, ia telah dikenal pasti bahawa laman web Panduan Kinta Tour kekurangan maklumat, kreativiti dan sebagainya. Sistem laman web yang sedia ada telah ditinjau oleh 30 orang responden dan komen mereka daripada soal selidik adalah penting kerana akan digunakan sebagai idea untuk meningkatkan laman web berdasarkan Kaedah-Kaedah Heuristik. Kebanyakan responden tidak berpuas hati dengan reka bentuk yang tidak menarik dan isi kandungan sistemsedia ada yang membosankan. Terdapat tiga peraturan utama dalam Kebolehgunaan Heuristik iaitu 8 Peraturan Emas, Prinsip Norman dan Peraturan Jakob Nielsen. Dalam projek Peningkatan Laman Web Panduan Pelancongan Kinta. Berdasarkan Elemen HCI, peraturan yang paling sesuai digunakan ialah Peraturan Heuristik Jakob Nielsen. Oleh itu dengan kaedah-kaedah Heuristik dan komen yang berguna daripada kajian, laman web yang dipertingkatkan dapat memenuhi semua keperluan pengguna laman web.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	ABSTRACT	**vii**
	TABLE OF CONTENTS	**ix**
	LIST OF TABLES	**xiii**
	LIST OF FIGURES	**xiv**
	LIST OF APPENDICES	**xix**
1	**INTRODUCTION**	**1**
	1.1 Introduction	**1 - 5**
	1.2 Problem Statement	**5**
	1.3 Objectives	**5**
	1.4 Scopes	**5 - 6**
	1.5 Deliverables	**6**
	1.6 Thesis Organization	**6**
2	**LITERATURE REVIEW**	**7**
	2.1 Survey on the existing system of Ipoh Tourism webpage	**7 - 12**
	2.2 Systems that similar with the existing Kinta Tour Guide Webpage	**13**
	2.2.1 Survey on the existing system that similar with the existing Kinta Tour Guide Webpage	**13 - 18**
	2.2.2 Survey on the existing system that similar with the existing Kinta Tour Guide Webpage	**18 - 19**
	2.2.3 Survey on the existing system that similar with the existing Kinta Tour Guide Webpage	**20 - 23**
	2.2.4 Survey on the existing system that similar	**23 - 25**

with the existing Kinta Tour Guide Webpage
2.2.5 Survey on the existing system that similar with the existing Kinta Tour Guide Webpage **25 - 29**
2.3 Heuristic Evaluation of Human Computer **29 - 30**
2.3.1 8 Golden Rules of Interface Design **30**
2.3.1.1 Strive for consistency **30 - 31**
2.3.1.2 Enable frequent users to use shortcuts **31**
2.3.1.3 Offer informative feedback **31**
2.3.1.4 Walk uses through more complicated tasks **31 - 32**
2.3.1.5 Offer simple error handling **32**
2.3.1.6 Permit easy reversal of actions **32**
2.3.1.7 Make the user feel in control **32**
2.3.1.8 Keep it simple **32**
2.3.2 Ten Usability Heuristics **33**
2.3.2.1 Visibility of system status **34**
2.3.2.2 Match between system and the real world **34 - 35**
2.3.2.3 User control and freedom **35**
2.3.2.4 Consistency and standards **36**
2.3.2.5 Error prevention **36**
2.3.2.6 Recognition rather than recall **36**
2.3.2.7 Flexibility and efficiency of use **37**
2.3.2.8 Aesthetic and minimalist design **37**
2.3.2.9 Help users recognize, diagnose, and recover from errors **38**
2.3.2.10 Help and documentation **38**
2.3.2.11 Updated Findings **38**
2.3.3 Norman's Principle **39**
2.3.3.1 Visibility and Feedback **39**
2.3.3.2 Natural Mapping **39**
2.3.3.3 Constraints **39 - 41**
2.3.3.4 Design for Error **41 - 43**
2.3.3.5 Consistency **55**
2.3.4 Summary of three heuristic evaluations of Human Computer Interaction **44**

	2.4 Proposed System	**44 - 46**
	2.5 Conclusion	**46**
3	**METHODOLOGY**	**47**
	3.1 The Justification of Research Methodology Process	**47 - 48**
	3.1.1 Planning Phase	**48**
	3.1.2. Analysis Phase	**48**
	3.1.3. Implementation Phase	**48**
	3.1.4. User Design	**48**
	3.1.5. Testing	**49**
	3.2 Implementation of Research Methodology Process in the Kinta Tour Guide Webpage	**50**
	3.2.1 Planning Phase	**50 - 59**
	3.2.2 Analysis Phase	**60**
	3.2.3 Analyze of the Design Rules for Implementation Phase	**60**
	3.2.3.1 Software and Hardware Tools	**61**
	3.2.3.2 Hardware	**61**
	3.2.3.3 Software	**62**
	3.2.4User Design Phase	**63 - 65**
	3.2.5 Testing Phase	**66**
	3.3 Research on Current Situation	**66**
4	**IMPLEMENTATION**	**67**
	4.1 Implementation	**67**
	4.1.1 Visibility of System Status	**67 - 73**
	4.1.2 Match between System and The Real World	**73 - 75**
	4.1.3 User Control and Freedom	**75 - 80**
	4.1.4 Error Prevention & Help Users Recognize, Diagnose, and Recover From Error (Combined)	**80 - 83**
	4.1.5 Recognition Rather Than Recall	**83 - 84**
	4.1.6 Aesthetic and Minimalist Design	**85 - 88**
	4.1.7 Consistency and Standards	**88 - 92**
	4.2 Testing	**93**

5	**RESULT**	**94**
	5.1 Analysis of Data Collection based on Survey Questions	**94 - 96**
	5.2 Analysis of Survey Questions Result	**97 - 117**
6	**CONTRIBUTIONS, LIMITATION, FUTURE RESEARCH & CONCLUSION**	**118**
	6.1 Contributions	**118 - 119**
	6.2 Limitation	**119 - 120**
	6.3 Future Research	**120 - 122**
	6.4 Conclusion	**109**
7	**REFERENCES**	**123 - 126**
8	**APPENDICES**	**127**
	A Gantt Chart	**128**
	B Survey Questions 1	**129 - 131**
	C Survey Questions 2	**132 - 34**

LIST OF TABLES

TABLE NO.	TITLE	PAGE
1.1.1	Ten Heuristics of usability	**3 - 4**
3.2.3.2.1	Hardware Tools	**61**
3.2.3.3.1	Software Tools	**62**
5.1.1	Data Collection Based On the Survey Questions of Existing Website	**95**
5.1.2	Data Collection Based On the Survey Questions of Enhanced Kinta Tour Guide Webpage	**96**

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1.1	Ipoh Tourism Banner	**8**
2.1.2	Ipoh Tourism Destination	**9**
2.1.3	Ipoh Tourism Travel Suggestion	**9**
2.1.4	Ipoh Tourism Section's List	**10**
2.1.5	Ipoh Tourism Introduction	**11**
2.1.6	Ipoh Tourism Cuisine	**12**
2.1.7	Ipoh Tourism Sponsor's Page	**12**
2.2.1.1	Ipoh Tourism Banner	**13**
2.2.1.2	Ipoh Tourism Selection of Language	**14**
2.2.1.3	Ipoh Tourism Slide Photos	**14**
2.2.1.4	Ipoh Tourism Introduction	**15**
2.2.1.5	Ipoh Tourism Interesting Getaways	**16**
2.2.1.6	Ipoh Tourism Travel Assistant	**17**
2.2.1.7	Ipoh Tourism Share's Link	**17**
2.2.1.8	Ipoh Tourism Packages	**18**
2.2.2.1	Ipoh Tourism Introduction	**19**
2.2.2.2	Ipoh Tourism Interesting Getaways	**19**
2.2.3.1	Ipoh Tourism Heading	**20**
2.2.3.2	Ipoh Tourism Slide Show	**21**
2.2.3.3	Ipoh Tourism Interesting Getaways	**21**
2.2.3.4	Ipoh Tourism Rating	**22**
2.2.3.5	Ipoh Tourism Forum and Tourist Guidance	**23**
2.2.4.1	Ipoh Tourism Heading	**24**
2.2.4.2	Ipoh Tourism Interesting Getaways	**24**

2.2.4.3	Ipoh Tourism Special Links	**25**
2.2.5.1	Ipoh Tourism Heading	**26**
2.2.5.2	Ipoh Tourism Photos	**26**
2.2.5.3	Ipoh Tourism Forum	**27**
2.2.5.4	Ipoh Tourism Travel Services	**28**
2.2.5.5	Ipoh Tourism Country Information	**28**
2.2.5.6	Ipoh Tourism Viewers' Information	**29**
2.2.5.7	Ipoh Tourism Map	**29**
2.3.2.1	Ipoh Tourism Header	**34**
2.3.2.2	Ipoh Tourism Content	**35**
2.3.2.3	Ipoh Tourism Content	**35**
2.3.2.6	Introduction of Ipoh Tourism	**36**
2.3.2.8	Ipoh Tourism Contents	**37**
3.1.1	Research Methodology Process Flowchart Diagram	**49**
3.2.1.1	Header of Tourism Penang Website	**51**
3.2.1.2	Malaysia Tourism Contents	**52**
3.2.1.3	Blog Design Webpage Contents	**53**
3.2.1.4	Options of the Microsoft Word header	**53**
3.2.1.5	Options of Microsoft Power Point header	**54**
3.2.1.6	Error Message of the 'Leave Comment' section	**55**
3.2.1.7	Highlighted Option of Action	**56**
3.2.1.8	Options of selected action	**57**
3.2.1.9	Information text layout	**57**
3.2.1.10	Language changed of the webpage	**58**
3.2.1.11	Help Function	**59**
3.2.4.1	User Interface Flow Diagram of Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage	**65**
4.1.1.1	Banner of Kinta Tour Guide Website	**67**
4.1.1.2	Perak Flag	**68**
4.1.1.3	Coding Implementation for Kinta Tour Guide Webpage Banner	**68**
4.1.1.4	Logo and Banner of Kinta Tour Guide website	**69**
4.1.1.5	Footer of Kinta Tour Guide Website	**70**

4.1.1.6	Coding Implementation for Logo, Banner and Main menu of Kinta Tour Guide Webpage	**70**
4.1.1.7	Coding Implementation for Footer of Kinta Tour Guide Webpage	**71**
4.1.1.8	Header of Webpage	**72**
4.1.1.9	Header of Webpage	**72**
4.1.1.10	Coding Implementation of a Header's Topic Main Menu's Topic	**73**
4.1.2.1	Contents of 'About Ipoh' Webpage	**74**
4.1.2.2	Menu's of Website Information	**74**
4.1.2.3	Coding Implementation of Main Menu	**74**
4.1.2.4	Coding Implementation of Webpage's Contents	**75**
4.1.3.1	Original Position of Main Menu	**76**
4.1.3.2	Bottom Position of Main Menu	**76**
4.1.3.3	Coding Implementation of Main Menu of the Webpage	**77**
4.1.3.4	Thumbnail Photos Viewer	**77**
4.1.3.5	Photo Viewer with 'Next' Button Function	**78**
4.1.3.6	Photo Viewer with 'Previous" Button Function	**78**
4.1.3.7	Original Font Size of Contents	**79**
4.1.3.8	Increased Font Size of Contents	**79**
4.1.3.9	Decrease Font Size of Contents	**79**
4.1.3.10	Font Size Adjustment Codes Function	**80**
4.1.4.1	Users' Input Information	**81**
4.1.4.2	Reset Button Function	**81**
4.1.4.3	Coding Implementation of 'Reset' Button Function	**82**
4.1.4.4	Pop Out Error Message	**82**
4.1.4.5	Coding Implementation of Pop Out Message Box	**83**
4.1.5.1	Hotel's Photo Image	**84**
4.1.5.2	Coding Implementation of Photos Displayed	**84**
4.1.6.1	Photo of Images As Contents' Representative	**85**
4.1.6.2	Admin Login Hyperlink	**86**
4.1.6.3	Coding Implementation of 'Admin Login' Hyperlink Navigation	**86**

4.1.6.4	Admin Login Page	**86**
4.1.6.5	Coding Implementation for ‘Admin Login’ Webpage	**87**
4.1.6.6	Information Database System (Admin Page)	**87**
4.1.6.7	Registration Form	**88**
4.1.7.1	Food To Eat Webpage’s Contents	**89**
4.1.7.2	Place To Stay Webpage’s Contents	**89**
4.1.7.3	Place To Go Webpage’s Font-Size Contents	**90**
4.1.7.4	Contact Us Topic’s Header	**90**
4.1.7.5	Original Selected Light Yellow Colour	**91**
4.1.7.6	Bright Blue Colour	**92**
4.1.7.7	Walnut Colour	**92**
5.1.1	Graph Bar of Existing Website before Enhancement	**95**
5.1.2	Graph Bar Kinta Tour Guide Webpage after Enhancement	**96**
5.2.1	Percentage shown based on question number 1	**98**
5.2.2	Banner of the Existing Tour Guide Webpage	**98**
5.2.3	Banner of the Enhanced Kinta Tour Guide Webpage	**98**
5.2.4	Percentage shown based on question number 2	**100**
5.2.5	Language Contents of the Existing Tour Guide Website	**100**
5.2.6	Simple Language Used of Contents of the Kinta Tour Guide Webpage	**101**
5.2.7	Percentage shown based on question number 3	**102**
5.2.8	Arrow Icon as Hyperlink ‘Back’ Function of the Existing Tour Guide Website	**102**
5.3.9	‘Next’ Button of the Enhanced Kinta Tour Guide Webpage	**103**
5.2.10	Percentage shown based on question number 4	**104**
5.2.11	Hyperlink Navigations Menu of the Existing Tour Guide Website	**104**
5.1.12	Hyperlink Navigation Main Menu of the Enhanced Kinta Tour Guide Webpage	**105**
5.2.13	Percentage shown based on question number 5	**106**
5.2.14	Pop Out Error Message Box of the Enhanced Kinta Tour Guide Webpage	**107**

5.2.15	Percentage shown based on question number 6	**108**
5.2.16	Accommodation Contents of the Existing Tour Guide Website	**108**
5.2.17	Few Sentences of Contents of the Enhanced Kinta Tour Guide Webpage	**109**
5.2.18	Percentage shown based on question number 7	**110**
5.2.19	Font Size Adjustment for Contents of the Enhanced Kinta Tour Guide Webpage	**110**
5.2.20	Percentage shown based on question number 8	**111**
5.2.21	Background Colour of the Existing Tour Guide Website	**112**
5.2.22	Background Colour of the Enhanced Kinta Guide Webpage	**112**
5.2.23	Percentage shown based on question number 9	**104**
5.2.24	Only a Piece of Photo Displayed to Represent Contents of the Existing Tour Guide Webpage	**114**
5.2.25	Photo Displayed of ‘Perak Tong Temple’ of the Enhanced Kinta Tour Guide Webpage	**114**
5.2.26	Percentage shown based on question number 10	**115**
5.2.27	Layout Design of the Existing Tour Guide Website	**116**
5.2.28	Webpage’s Layout Design of the Enhanced Kinta Tour Guide Webpage	**116**

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A	Gantt Chart	**128**
B	Survey Questions 1	**129 - 131**
C	Survey Questions 2	**132 – 134**
D	Result of Survey Question 1 (Before Enhancement)	**135**
E	Result of Survey Question 2 (After Enhancement)	**136**

CHAPTER I

INTRODUCTION

This chapter briefly discuss on the overview of this research. It contains six sections. The first section is introduction; follow by the problem statement. Next are the objectives where the project's goal is determined. After that are the scopes of the system, deliverables of the system and lastly is the thesis organization which briefly describes the structure of this thesis.

1.1 Background

Kinta strict is one of the ten administrative districts of Perak, Malaysia, and it is divided into two major councils which are Ipoh City Council (Majlis Bandaraya Ipoh), based in Ipoh, the state capital of Perak and West Kinta District Council (Majlis Daerah Kinta Barat), based in the town of Batu Gajah [1]. Kinta is one of the most congested areas in Perak. The majority of the Kinta lived in the north, the region about the capital of Perak, Ipoh [2]. Kinta Nature Park is a legacy of Perak's tin mining heritage. The tin-mining boom times in Perak came to an end in the 1980s with the crash of the tin market and the depletion of tin deposits. By the 1990s, the tin industry had collapsed, affecting some 70,000 hectares in Kinta Valley alone and leaving extensive tracts of idle land consisting of barren tailings sand and hundreds of mining pools [3].

Ipoh is the state capital of Perak, on the west coast of peninsular Malaysia [4]. Although it was a rich town, it was not the original administrative centre of Perak. It

was not also the British, but the Japanese that provided the turning point for Ipoh. During their occupation of Malaya in 1941, the Japanese Imperial Army transferred all administrative concerns from Batu Gajah and Taiping to Ipoh. The British actually endorsed this arrangement when they returned to power, and continued to retain Ipoh as Perak's administrative centre [5]. The name Ipoh is derived from a local tree, ‘Pohon Epu’ or now more commonly known as ‘Pokok Ipoh’. The sap of this plant is poisonous and was used by ‘Orang Asli’ (Indigenous Peoples in Malay) to coat the tips of the darts of their blowpipes for hunting purpose. The Cantonese name for Ipoh derives the word ‘Yee Bow’ and in Mandarin ‘Yi Bao’ (Chinese: 怡保) which mean Found Treasure, the name was after the Cantonese ‘Hoi San Clan’ - the first batch of Chinese Labour that move to the area for tin mining where then build a small town for F&B, medical, grocery & hardware trading, bringing Ipoh a huge boost in economy and population. Among the local Chinese, Ipoh as known as ‘Paloh’ (Chinese: 霸箩) (mining pump in Malay), name after the gigantic mining pump used for early tin ore extraction. Nowadays, ‘Paloh’ refers to the Old Town area previously known as ‘Kampung Paloh’ (Paloh Village in Malay) [6]. The Perak government wants to turn the "Old Town" part of Ipoh into a heritage attraction to draw domestic and foreign tourists. Today, Ipoh has developed significantly [7]. The Greentown area near the City Council is fast becoming an entertainment hotspot with the construction of the Greentown Business Centre [8]. The city of Ipoh houses some of the best limestone cave systems in Malaysia. The formation of these glistening stalactites and stalagmites took place over millions of years [9]. Ipoh is famous for its restaurants, which serve delicious local foods influenced by the high proportion (roughly 70 percent) of ethnic Chinese in its population of over 700,000 people [10].

In the era of science and technology, the usage of Internet is undeniable for its unlimited supply of information. The creation of website is a huge achievement for human kind. It provides us the ability to get and collect any information almost instantly from every part of the world by just a mere click. The websites is being updated time to time and many new sites are being created everyday. Therefore, a website being created should be as attractive as possible to get the attention of Internet users. Anyway, there are a lot of web pages which are unattractive and boring. For example, some of the pages in the Internet are full with words, dull

designed and lack of pictures presented. This will absolutely make the viewers feel boring and they will not hesitate to change for another webpage in no time. Hence, those are the web pages which have to be upgraded especially about tourisms. A website that introduces a tourism destination should be as creative as possible to curb the viewers' enthusiasms. An Internet user will be keen to surf the website page by page, word by word without getting bored. A good and attractive webpage also will not bring about frustrations to the viewers. On the other words, it should be attractive, simple as well as packed with useful information.

In order to enhance or upgrade a webpage, the theory of Ten Heuristic Rules is applied. This is the most-used usability heuristics for user interface design by Jacob Nielsen. He has developed the heuristics based on the cooperation with Rolf Molich in 1990. The final set of heuristics that are still used today is the one which has been released by Nielsen in 1994. The Table 1.1.1 shows the 10 Heuristics of usability by Jacob Nielsen.

Table 1.1.1: Ten Heuristics of usability

Heuristic Rules	Usability
1. Visibility of system status	1. Keep users informed about what is going on through appropriate feedback within reasonable time
2. Match between system and the real world	2. Speak users' language with words, phases and concepts familiar to the user, rather than system oriented terms. Follow real-world conventions, making information appear in a natural and logical order
3. User control and freedom	3. Users often choose system functions by mistake and will need a clearly marked 'emergency exit' to leave the unwanted state without having to go through an extended dialogue. Support undo and redo
4. Consistency and standards	4. Users do not have to wonder whether different words, situations or action mean the same thing. Follow platform conventions

Heuristic Rules	Usability
5. Error Prevention	5. Even better than good error message is a careful design which prevent a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit the action
6. Recognition rather than recall	6. Minimize the user's memory load by making objects, actions and options visible. Instructions for use of the system should be visible or easily retrievable whenever appropriate
7. Flexibility and efficiency of use	7. Accelerators which unseen by novice user who may often speed up the interaction for the expert user such that the system can cater to both inexperience and experienced users. Allow users to tailor frequent actions
8. Aesthetic and minimalist design	8. Dialogues shouldn't contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility. Visual layout should respect the principles of contrast, repetition, alignment and proximity
9. Help users recognize, diagnose and recover from errors	9. Error message should be expressed in plain language (no codes) precisely indicate the problem and constructively suggest a solution
10. Help and documentation	10. Any such information will be easy to search, focused on user's task, list concrete steps to be carried out and not be too large

For the sake of developing a more interesting internet contents for the users, the dull websites should be improved and enhanced. Therefore, this project is brought out in order to provide a better understanding and net-surfing atmosphere for the viewers.

1.2 Problem Statement

Most of the webpage found online are inconvenience and not well-planned. The webpage are usually very boring and not attractive to users. These make users lost interest to continue their search for travelling information in a short time. Besides, it is true that any information is available to be searched online. However, sometimes it's hard to find a webpage that contains full and packed information of what is wanted. Usually, users have to search more than one page in order to collect all of the needed information. This is because users are not able to find a single page that is packed with the needed information. Thus, users have to use up a lot of time searching for few webpage at the same time only for a single topic. In order to make it be more convenience for Internet users, a webpage that comprises of ample data and information under a specific topic must be developed.

1.3 Objectives

This project embarks the following objectives:

a. To enhance the Tour Guide Webpage for Kinta Tour Guide Webpage.
b. To utilize the Heuristic rules of Human Computer Interaction (HCI) by Jacob Nielsen.
c. To verify the effectiveness of the project by bringing out random survey using survey form.

1.4 Scopes

a. Enhancement of Kinta Tour Guide Webpage for Ipoh Tourism by using Jacob Nielsen's Heuristic Rules of HCI.
b. The software used for the Enhancement of Kinta Tour Guide Webpage for Ipoh Tourism is Microsoft Visual Web Developer 2010 Express. There will be various languages applied using Microsoft Visual Web Developer 2010 Express which

consists of HyperText Markup Language (HTML), Cascading Style Sheet (CSS), JavaScript language, Jquery, and ASP.Net.

c. Most of the users of the Kinta website are UMP students.

1.5 Deliverables

a. Enhancement of the tour guide webpage for Kinta Tour Guide Webpage.
b. The Heuristic rules of Human Computer Interaction (HCI) by Jacob Nielsen applied in the Kinta Tour Guide Webpage.
c. Result of the survey form.

1.6 Thesis Organization

This thesis consists of four (4) chapters. Chapter 1: Introduction briefly describes and introduces the system. This system preliminary shows the basic concept of the system, problem statements of the system, objectives, scopes, and how the report is organized. Chapter 2: Literature Review depicts the manual systems and the existing systems as the case studies of the project. This chapter also reviews the technique, method, equipment, and technology that had been used in the case studies. Chapter 3: Methodology discusses about the overall workflow in the development of the project. This chapter also discusses the method, technique or approach that has been used while designing and implementing the project. Chapter 4: Conclusion briefly summarizes the project.

CHAPTER 2

LITERATURE REVIEW

Over the years, computers and programs have become easier to use. Computer programs have become more user friendly, taking advantage of user friendly design. Minimal mouse clicks are only part of the picture to increase the computing experience. Cleaner, less cluttered “work spaces” for software is the heart of HCI. HCI is an acronym for Human Computer Interaction. It is a very wide discipline which studies all the elements linked to the human use of computers and software. It also concerns devices which can be linked to computers such as video terminals, mobile devices and computerised consoles. The main aim of HCI is to make the use of software and computerised devices as simple and easy to understand as possible, with the aim of improving the efficiency and effectiveness of the actions taken at the same time. This project covers the application of Heuristic Rules for usability evaluation.

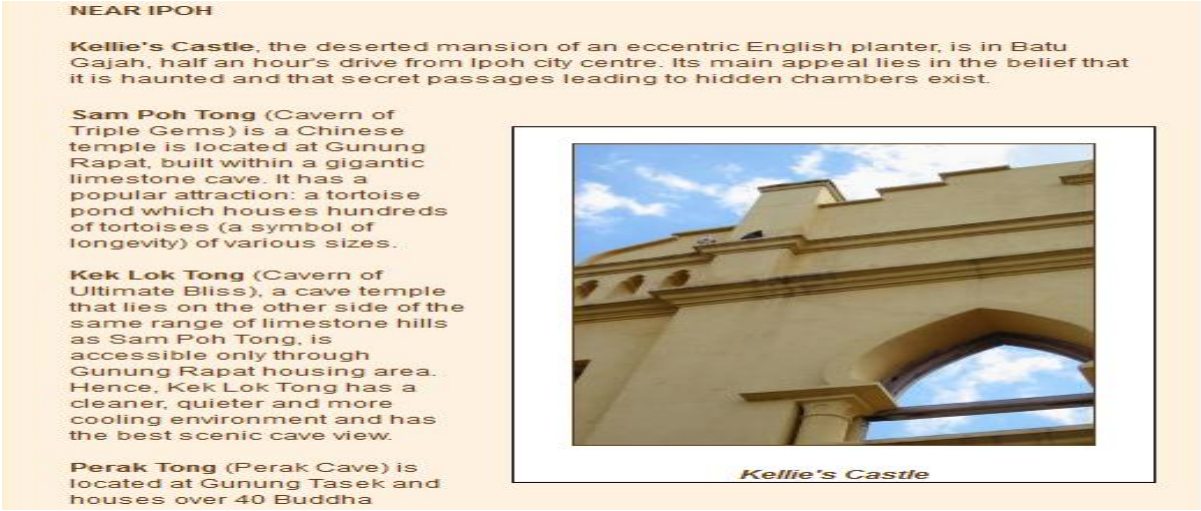
2.1 Survey on the existing system of Ipoh Tourism webpage

The website of Ipoh Destination Guide [11] is the selected Ipoh Tourism webpage for evaluation and will be innovated in the project. The project contains a few weaknesses which need some improvement using Heuristic Rules. The parts which are needed to be upgraded are being shown in the images within the following paragraphs, along with the descriptions.

Figure 2.1.1 shows the header of the website which may confuse the visitors' thought that came from foreign countries. The main title above is stated as 'Destination Guide Ipoh' but the picture above is showing the city of Kuala Lumpur. Hence once the foreigners view the page, foreigners will imagine that the city shown in the picture is the Ipoh City. Kuala Lumpur City's picture is at the top of the page and the picture shown will definitely misleading the first thought of the viewers. A photo represents a thousand words, so the photos placed in the webpage should be chosen carefully. At least, the image shown in the banner should be changed to the pictures of the view of Ipoh City.

Figure 2.1.1: Ipoh Tourism Banner

The Figure 2.1.2 shows one of the parts within the webpage. The content is full with text and words and it is boring for the viewers. Actually the content shown above is the most important part of the page as it introduces the tour sites within the area of Ipoh. The problem is that the elaboration and explanation written is inadequate and unattractive. It is too simple and only one photo about Kellie's Castle is presented. In additional to that, the photo is not interesting and dull. The photo shown should be the overview of the whole building structure for a clearer image of Kellie's Castle. Besides that, the picture of others tourism places introduced in the content also should be presented too. In other words, words and photos should be at a balance within a page.



NEAR IPOH

Kellie's Castle, the deserted mansion of an eccentric English planter, is in Batu Gajah, half an hour's drive from Ipoh city centre. Its main appeal lies in the belief that it is haunted and that secret passages leading to hidden chambers exist.

Sam Poh Tong (Cavern of Triple Gems) is a Chinese temple is located at Gunung Rapat, built within a gigantic limestone cave. It has a popular attraction: a tortoise pond which houses hundreds of tortoises (a symbol of longevity) of various sizes.

Kek Lok Tong (Cavern of Ultimate Bliss), a cave temple that lies on the other side of the same range of limestone hills as Sam Poh Tong, is accessible only through Gunung Rapat housing area. Hence, Kek Lok Tong has a cleaner, quieter and more cooling environment and has the best scenic cave view.

Perak Tong (Perak Cave) is located at Gunung Tasek and houses over 40 Buddha

Kellie's Castle

Figure 2.1.2: Ipoh Tourism Destination

The Figure 2.1.3 shows one of the parts within the webpage. The content is about the interesting getaways near the Ipoh area. The content of this part is obviously too plain and dull. The content contains too many words and makes viewers feel boring. Hence, every viewer will definitely will lose enthusiasms on the contents. The places introduced should be attached with photos too or at least some interesting images related to the pages.

JUST OUTSIDE IPOH (travel suggestions)

Pangkor is a fishing village island with many beautiful beaches. There are two famous resorts when mentioning Pangkor: Pangkor Laut (which is on a small 1 resort adjacent island) and Pan Pacific resort. Nearby places such as Lumut, Sitiawan and Pangkor Island offer very good seafood.

Cameron Highlands is Peninsular Malaysia's most famous highland destination. Many vegetable, strawberry and tea farms are to be seen there. The cool weather and beautiful scenery makes it a popular hideaway from the warm weather in the rest of the state. There is a toll-free road to Cameron Highland from Simpang Pulai located at south of Ipoh. It will take about an hour to reach there from Ipoh by car.

Gua Tempurung or Tempurung Cave, Perak's best kept secret, is a must visit if you are an adventurous person. It is located at Gopeng, just 24km south of Ipoh. There are many unique and fascinating limestone formations in the cave. There are a few challenging cave exploration packages that are very exciting where you need to climb, crawl and slide. There is a shuttle bus and tour service at Medan Gopeng bus station in Ipoh. It takes about 30 minutes to get there.

Lata Kinjang waterfalls is a majestic waterfalls that is visible from the North-South highway, after passing the Tapah exit.

Taiping, was the first major township developed by the British in Malaysia. It is a very peaceful and quiet town. Its attractions are beautiful Maxwell Hill (or now known as Bukit Larut) and Taiping Lake Gardens, and Taiping Zoo.

Tg. Tualang is located south of Ipoh and offers very good seafood. Also if you want to see a tin dredger-turned-museum, head to this town. It is still yet to be opened, but you can take a geek at this machine from a far.

Figure 2.1.3: Ipoh Tourism Travel Suggestion

The Figure 2.1.4 shows a part of the webpage which is a system created for the ease of viewers. There are a series of contents in the menu of 'Jump to Section'. The viewers just have to click what viewers want according to the menu and the navigator will lead viewers straight jump to the attached content. However, the navigation used contains a weakness. All of the contents are packed within the same page, making the page too long. For example, when the viewer wants to know the routes of Ipoh, the viewer can click the 'Direction of Ipoh' button in the menu and the navigation used will lead to the attached content but the content is still within the same webpage. The content is better to have a specific page for a specific section. For instant, when a viewer clicks a selected title in the menu, the navigation used will lead the viewer to another page that is only packed with the related information and images. When every section has its own page, then more information related to the specific title can be presented in the page and would not make it like a mixture of different components. Whenever a viewer wants to get out from the page, the viewer just has to close the page and straight back to the main menu for other subtitles. This will make the webpage looked more systematic and packed with relevant information.

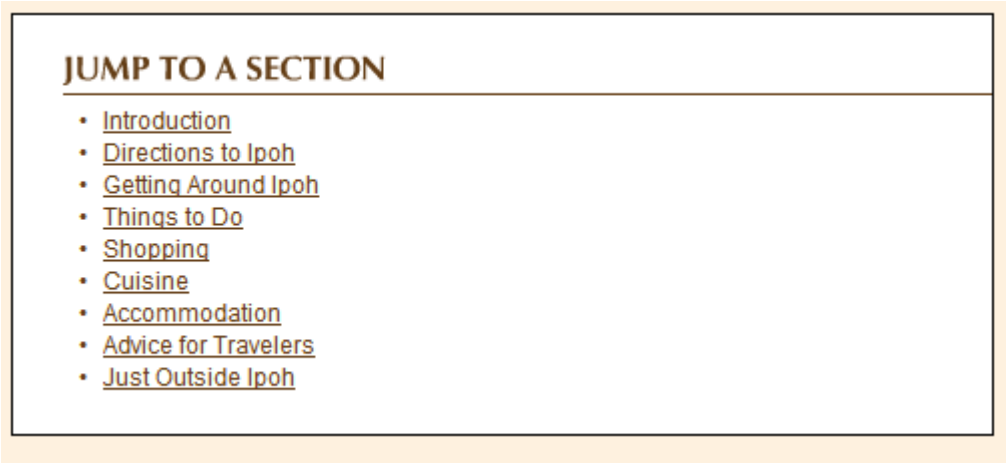


Figure 2.1.4: Ipoh Tourism Section's List

The most important thing in a passage is the introduction of the whole story. The Figure 2.1.5 is the part of introduction within the webpage. The first impression given to the viewers is 'dull'. The background colour and the font colour unmatched, unattractive borders and word is too much for a tourism introduction page. Even the photo shown is not enough to be an attention getter. Background colour, font colour and borders should be designed creatively to make viewers feel that the page is worth

to be spent more time on. Additionally, more photos should be presented and not just a dull, olden photo but does not mean that old photo is not good. Indeed, the photo brings a lot of memories about the historical Ipoh but to attract tourism, at least some latest photos of Ipoh City is shown within the same part too.

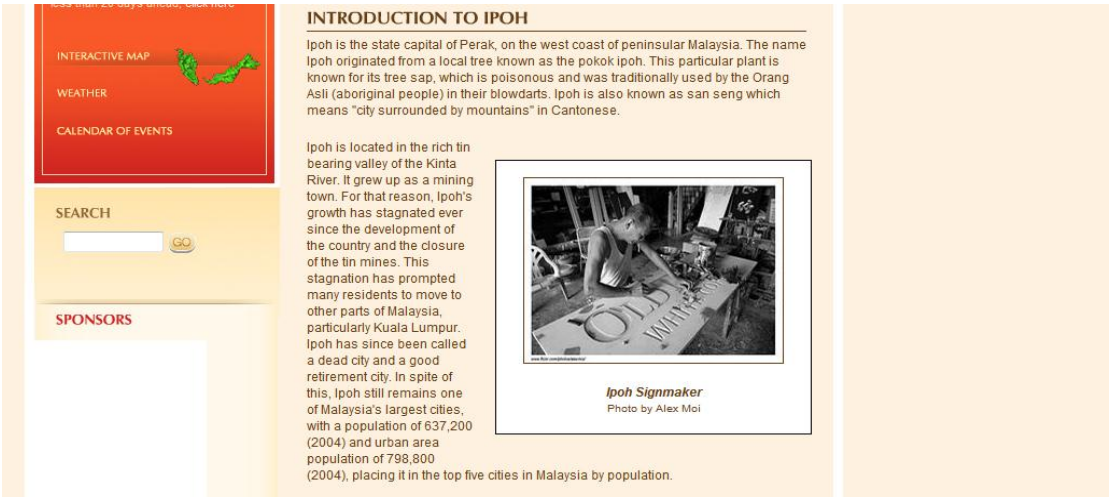


Figure 2.1.5: Ipoh Tourism Introduction

The contents in the Figure 2.1.6 are too wordy. The visitors fly from far away to Ipoh is mainly to taste the delicious cuisine of Ipoh. Most of the visitors are historical but yet the taste and aroma of those food are still remained the same from one generation to another. Hence, in order to attract more foreign visitors to have a taste of the Ipoh cuisine, each of the food mentioned above is better to be attached with appropriate and interesting photos. However, the idea to put all the pictures within the same part is inconvenient as there are many types of cuisine in Ipoh. A webpage be messy if there are too many photos displayed and compact within the same page. Therefore, the photos are better to be designed as a slide show and are attached to the page. The slide show design is applied to make the page more standardized and packed with information.

CUISINE

FOOD

Ipoh is famous for its Chinese food.

Ipoh beansprouts chicken, which consists of chicken meat, assorted chicken innards and beansprouts boiled in hard water and served with soy sauce and sesame oil. Ipoh's beansprouts are very fat, short and tastier than those produced outside Ipoh, thus Ipoh's beansprouts also receive orders from other states. Famous beansprout chicken noodles include Onn Kee and Lou Wong (Restaurants both located at the junctions of Yau Tet Shin Street and Osbourne Street.

Ipoh Sar Hor Fun, which are rice flat noodles prepared in hard water and served in clear chicken and prawn soup with chicken shreds, prawns and spring onions. Famous sar hor fun include Thean Chun and Kong Heng Restaurants - located along Leech Street in the old town. Other popular food choices include chicken and pork intestines satay, curry pork skin chee cheong fun, and their custard! Custards are usually sold out around 3pm weekdays and noon on Saturdays and Sundays.

Ipoh Chicken Rice. The famous Ipoh Chicken Rice can be found in Bak Gong restaurant located near the Foh San restaurant in city centre,. (Opens afternoon)

Hor Hee noodles. This is also a very delicious kuey teow noodles with fish balls and fish pastes. The most famous stalls selling Hor Hee including those located in Heng Heung restaurant besides restaurant Sin Yean Lee in Ipoh Old Town (Opens only at night), and also the "Gao Peng" restaurant at Charmberlain Road in Ipoh New Town (again, night only).

Dim sum (fish balls, fried stuff, dumplings, buns, served in small quantities). Foh San restaurant, located nearby the tauge ayam outlets, is a famous. It has a branch in SS2 Petaling Jaya, the satellite town of Kuala Lumpur. Yuk Fook Moon Lau (Opens

Figure 2.1.6: Ipoh Tourism Cuisine

The Figure 2.1.7 is a part from the webpage and the part is too much empty space left. The part can be replaced by advertisement notices such as logos of certain hotels, restaurants and so on. The logos will be attached to the page of the particular information. When a viewer clicks the logo, the clicked logo will lead the viewer to the related page.

Figure 2.1.7: Ipoh Tourism Sponsor's Page

2.2 Systems that similar with the existing Kinta Tour Guide Webpage

There are a lot of better tourism webpage that similar with the enhancement of the tour guide webpage based on HCI elements for Kinta tour guide webpage function which has been chosen to do critique and comparison. The subtopics below discuss about the images that are designed according the Heuristic Rules.

2.2.1 Survey on the existing system that similar with the existing Kinta Tour Guide Webpage

The website of Virtual Malaysia.com [12] is one of the selected webpage with creative design for Ipoh Tourism. The images shown in Figure 2.2.1.1 until Figure 2.2.1.8 are parts of the webpage that make the page interesting and convenient for the viewers.

The Figure 2.2.1.1 shows the picture that is used as the heading picture of the webpage. Picture is simple yet meaningful, designed with creativity and the message is clear. It represents everything in Malaysia such as One Malaysia theme, citizens with different races live together harmoniously, interesting getaways and so on, only in a single picture. Picture is suitable to be the heading of the tourism page. Once the viewers see the picture, viewers already can imagine about the colourful country of Malaysia that consists of various races, traditions, cultures and backgrounds. The picture has shown the theme of One Malaysia precisely.

Figure 2.2.1.1: Ipoh Tourism Banner

The Figure 2.2.1.2 allowed the viewers to choose the language of the whole page. The 'Select Language' option is very convenient for the foreigners from different countries and backgrounds to read through the page. The language selection option is very important because there are still many people around the globe that do not understand English even though English is an international language.

Figure 2.2.1.2: Ipoh Tourism Selection of Language

The Figure 2.2.1.3 shows the photo slide show within the page. All of the interesting photos are packed into a slide show and thus made the page seems tidy and well arranged. Figure 2.2.1.3 is the photos presented for the page's introduction.

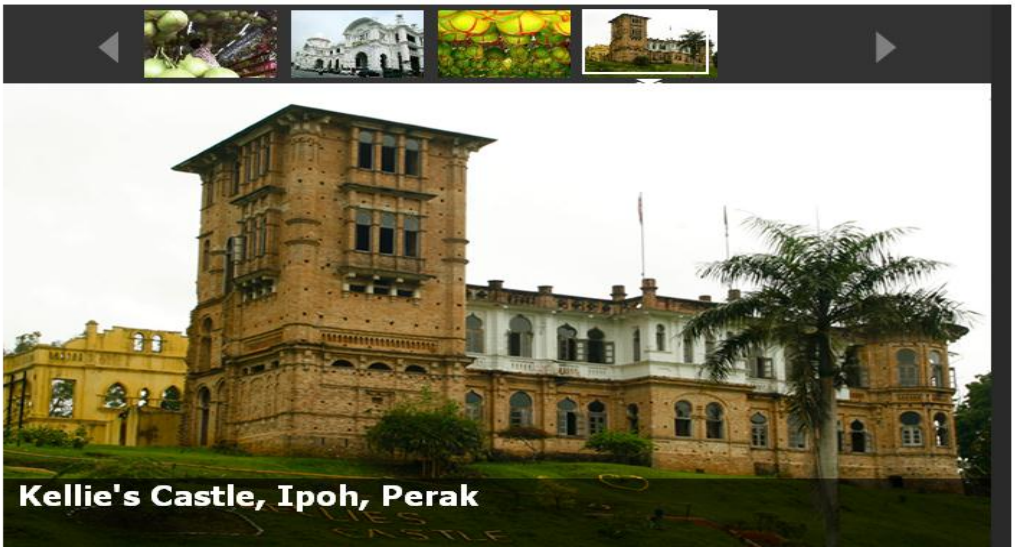


Figure 2.2.1.3: Ipoh Tourism Slide Photos

The passage of Figure 2.2.1.4 is the introduction of the page. The introduction to the Ipoh City is simple but packed with information, attached with slide show which is mentioned in the paragraph above. The slide show is clear and interesting. The photo chosen to be inserted into the slide has high visibility effect.

The overview of the building's surrounding and the building's unique construction are obviously captured in the photo. The selected photos a great one.

"Ipoh city, the capital of the Perak state is located about 200 km from Kuala Lumpur. The third largest city in the country with a population of over 710,000 people, it is named after the Ipoh tree – the poisonous sap is used to coat the tips of the Orang Asli's blowpipes."

Ipoh city, the capital of the Perak state is located about 200 km from Kuala Lumpur. The third largest city in the country with a population of over 710,000 people, it is named after the Ipoh tree – the poisonous sap is used to coat the tips of the Orang Asli's blowpipes.

At the turn of the 20th century, the tin-mining industry propelled the sleepy town into a frenzied hive of activities. The height of its glory peaked in the 1950s when it became the most happening entertainment hub in the country having the most cinemas, cabarets, amusement parks and night life. Its growth stagnated in the late 1970s when the tin prices came crashing down and the tin mines were closed.

Today, this charming and quaint city with magnificent limestone caves is being given a modern facelift with developments taking place in its suburbs. On 27 May 1988, it was granted city status by the Sultan of Perak, Sultan Azlan Shah. It is divided naturally by the Kinta River into two main townships – Ipoh Old Town and Ipoh New Town. The old town contains older and pre-war architectures comprising government buildings, shop lots, residences and historical landmarks.

Figure 2.2.1.4: Ipoh Tourism Introduction

The Figure 2.2.1.5 shows the part of the webpage that introduces interesting getaways within Ipoh. Every place is attached with a picture of the location and is attached with a button of 'Read More' as navigation. The 'Read more' button is for the viewers to click on the button and the button will lead the viewers to a whole new page which is packed with adequate details, information and interesting photos of the particular place. Viewers can open a few pages in the same time and just close the page whenever viewers like. This design is very interesting and attractive. The design is very effective for a tourism page to be designed like this.

Ipoh Town Hall Building
This stately colonial building with strong classical element was designed by government architect, A.B Hubback, who also designed the Railway Station. The Town Hall has been the venue of many significant events. Read more

Royal Ipoh Club & Padang
On 31 May 1962, the Sultan of Perak declared the formation of the Municipality of Ipoh at this Padang. Read more

Sam Poh Tong
This is the biggest temple in the country and is an impressive work of art and faith, with various statues of Buddha interspersed among natural stalactites and stalagmites. Read more

The Chartered Bank Building
The Chartered Bank of India, Australia and China Ltd. opened a branch office in Ipoh in 1902. It provided credit to the Straits Trading Company and later the Eastern Smelting Company. Read more

Ipoh Railway Station
Affectionately known to locals as Ipoh's 'Taj Mahal', it is an impressive landmark which combines Mooorish architecture with modern embellishments. Read more

Figure 2.2.1.5: Ipoh Tourism Interesting Getaways

The Figure 2.2.1.6 shows the applications which are available within the page. One just has to click the application in order to find for interesting place for accommodation and dining in Ipoh City. The application will lead the viewers to a page that will fulfil viewers' wish. For instance, if the viewers want to seek for the list of the best hotels available in Ipoh, just clicks on the 'Accommodations' hyperlink navigation in the menu of 'Travel Assistant' and similarly goes to 'Food & Dining and so on. One also can get help from the page of 'Travel Agent' too. The used of hyperlink navigation is simple and convenient.

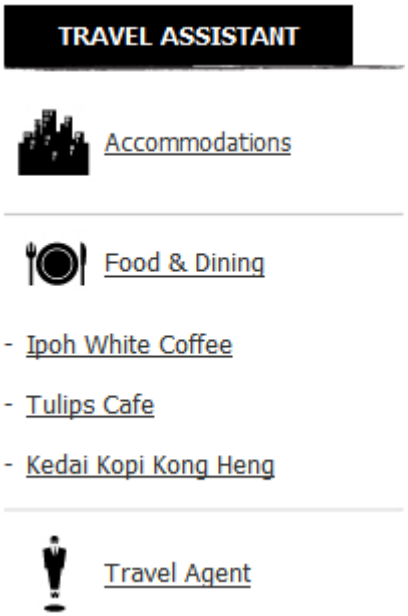


Figure 2.2.1.6: Ipoh Tourism Travel Assistant

According to the page shown in Figure 2.2.1.7, the page is also can be shared by latest popular communication technology such as 'Facebook' and 'Twitter'. Hence, viewers can share the page with as many friends and relatives as viewers' wants to, by just a mere click.

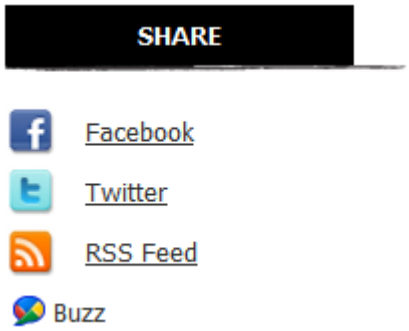


Figure 2.2.1.7: Ipoh Tourism Share's Link

The Figure 2.2.1.8 shows that the page also attached with travel packages. Viewers can even find for any packages that viewers wish to find in the application above. Viewers can determine the best packages for viewers themselves with the share's link chosen.

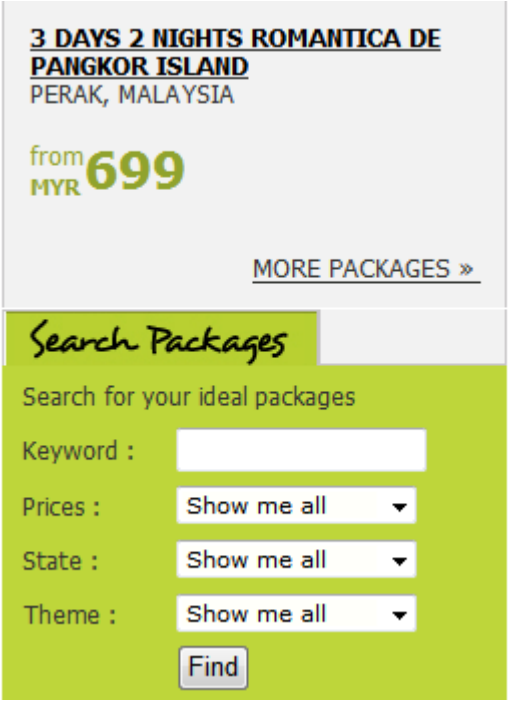


Figure 2.2.1.8: Ipoh Tourism Packages

2.2.2 Survey on the existing system that similar with existing Kinta Tour Guide Webpage

The website of Malaysia Hotel Review [13] is one of the selected webpage with creative design for Ipoh Tourism. The images shown in Figure 2.2.2.1 and Figure 2.2.2.2 are the parts of the webpage that make the page interesting and convenient for the viewers. The website of Malaysia Hotel Review contains a series of attractive photos and ample descriptions about Ipoh.

The Figure 2.2.2.1 shows the introduction part of the webpage. The page is attached to a series of photos regarding the wonderful sceneries of Ipoh. Besides that, the page is packed with information such as its location and description. With the help of those photos, viewers are exposed to a clearer image of what Ipoh City is like. In other words, the page is simple but contains adequate information and the photos are the main attraction of the page.

[MORE PHOTOS]

LOCATION:
The city of Ipoh is located about 200 km north of Kuala Lumpur. Journey through the North South Expressway (NSE or PLUS Highway) takes a breezy 2 1/2 hours through scenic rolling valleys, palm oil plantations and limestone hills of Peninsula Malaysia. Distances from other major cities: Penang (2 hours), Johor Bharu (6 hours), Singapore (6 1/2 hours) and Kuantan (5 hours).

DESCRIPTION:
A city rich in history, Ipoh often conjures the images of laid-back municipality intertwined with old-world charms and gastronomic delights even to the most persnickety types. The equally historic Kinta River (*Sungai Kinta*) cuts across the city, subliminally divides the locality into the much fabled Ipoh *Old Town* and *New Town*. In general, the city jurisdiction covers other smaller towns as well, namely Chemor, Jelapang, Falim (or Farlim), Menglembu, Tanjong Rambutan, Silibin, Manjoi, Simpang Pulai, Bercham, Tambun, Gunung Rapat, Sungai Rokam, Pasir Puteh, Lahat, Pengkalan, etc.

The city is administered by *Majlis Bandaraya Ipoh*, or (*un*)affectionately known as MBI by its citizens. The city, to some level, was founded by Sir Frank Swettenham, a British colonial resident, in 1893 when the Ipoh Sanitary Board was formed. In 1962, it was

Figure 2.2.2.1: Ipoh Tourism Introduction

The page of Figure 2.2.2.2 has a part for the viewers to find for accommodations and interesting getaways too. When viewers click on one of the attachment, the hyperlink navigation will lead viewers to another page that is related to the particular attachment and is presented by interesting photos and details. For sure, the viewers would not feel boring to open each of information's hyperlinks navigation and explore every detail that is available in the page.

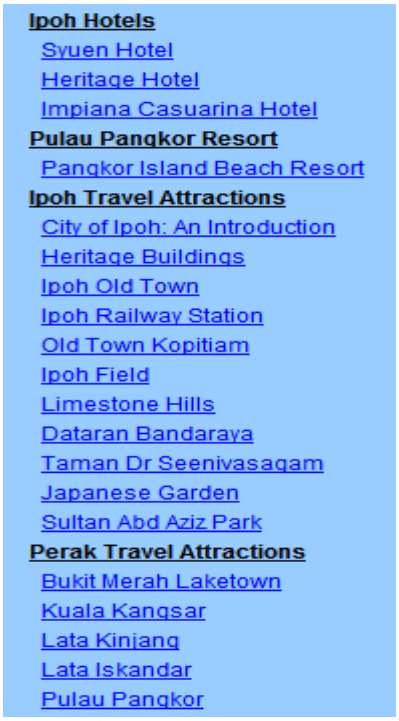


Figure 2.2.2.2: Ipoh Tourism Interesting Getaways

2.2.3Survey on the existing system that similar with existing Kinta Tour Guide Webpage

The website of Ipoh Tourism [14] is one of the selected webpage with creative design for Ipoh Tourism. The images shown below are the parts of the webpage that make the page interesting and convenient for the viewers.

The Figure 2.2.3.1 shows the heading of the webpage. From the header, viewers can be noticed that the page can be shared with friends in the 'Facebook' which one of the widest social networking nowadays. This makes the page more convenient to be shared with friends. In the same image, the header also can be notices that the page is attached to other links such as hotels, restaurants and so on which are available in Ipoh. One can open all of the information hyperlinks at the same time and get all the needed information. Then, simply close the page whenever viewers have gone through all of the information hyperlinks.

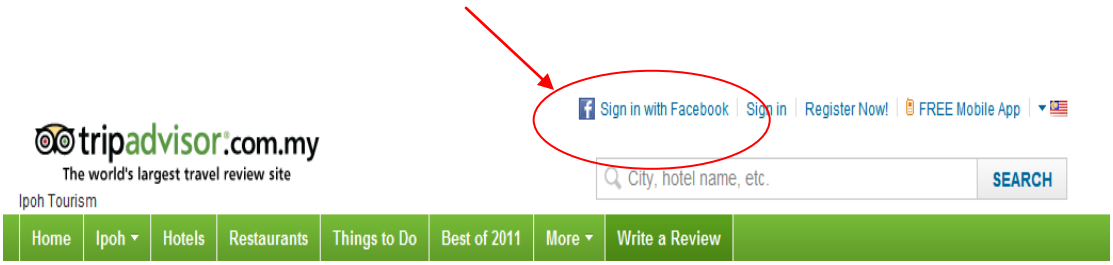


Figure 2.2.3.1: Ipoh Tourism Heading

The Figure 2.2.3.2 shows that the photos are being shared in a style of slide show. Slide show is indeed a very intelligent way to share photos especially when there are a lot of interesting photos to be shared. One just has to click slide by slide to view all of the photos. However, some of the pages will have many photos but the creator of those pages does not compile the photos in a slideshow. Instead, the photos are shared in a page that full of photos and viewers have to click on the photos one by one in order to view the photos. The design of photos that require viewers to click the photo one by one makes the page seems unarranged.

Figure 2.2.3.2: Ipoh Tourism Slide Show

The Figure 2.2.3.3 shows that the page also attached with links that promoting food, hotels and interesting getaways around Ipoh. One just has to simply click on the attached link and the hyperlink navigation will lead viewers to the particular page. Through the usage of the hyperlink navigation, attachments are definitely a helpful tool to whoever interested in visiting this city. The used of hyperlink navigation is easy and packed with information of the chosen attachment.

Figure 2.2.3.3: Ipoh Tourism Interesting Getaways

The Figure 2.2.3.4 shows a series of ratings according to surveys done about Ipoh. Viewers who interested in Ipoh can take those as consideration. In order to view the details, viewers just have to select what viewers want and open the link. Then the link will lead the viewers to the particular page with adequate information and photos. For example, travellers will like this kind of information most as travellers definitely want to enjoy the best things in every place in travellers' travelling list.

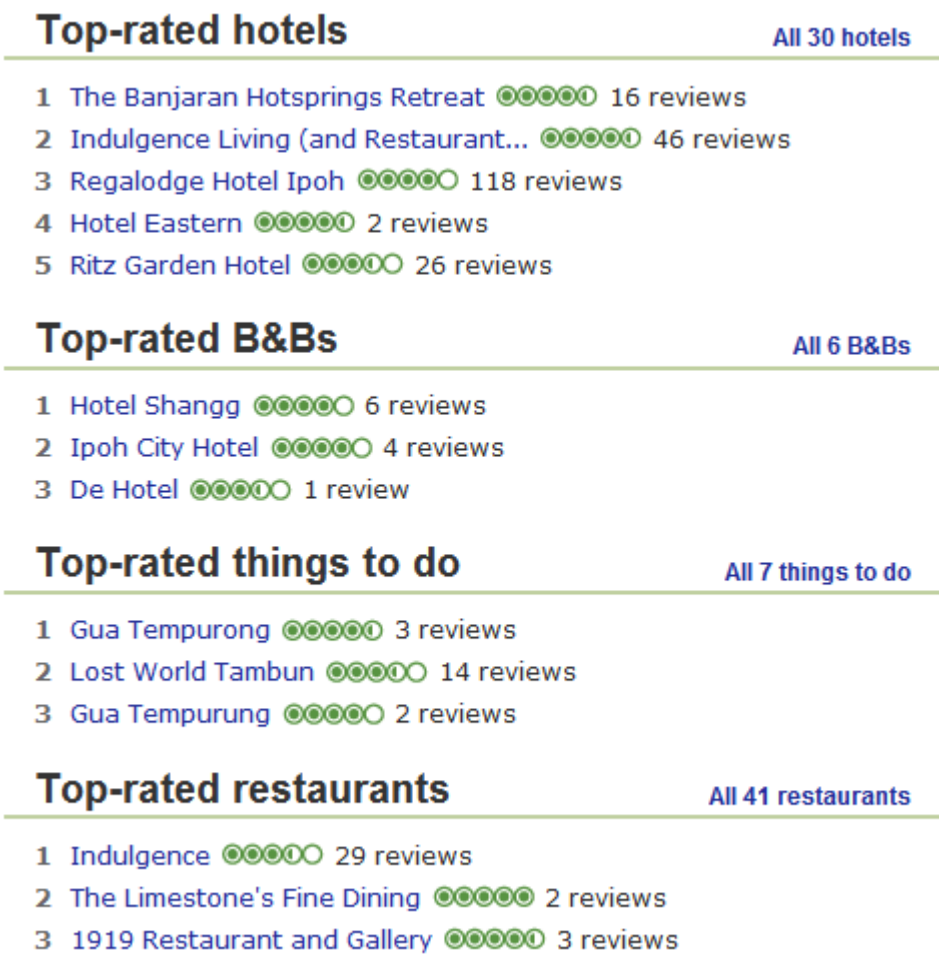


Figure 2.2.3.4: Ipoh Tourism Rating

The Figure 2.2.3.5 being shown is a part of the webpage also. Figure 2.2.3.5 shows that a forum about Ipoh is made available within the page. Forum is a convenient tool in a webpage for the sake of tourist guidance where viewers can communicate and exchange ideas, experiences as well as helpful information within the forum post.

Figure 2.2.3.5: Ipoh Tourism Forum and Tourist Guidance

2.2.4 Survey on the existing system that similar with existing Kinta Tour Guide Webpage

The website of Kinta District [15] is one of the selected webpage with creative design for Ipoh Tourism. The images shown in Figure 2.2.4.1 until Figure 2.2.4.3 are the parts of the webpage that make the page interesting and convenient for the viewers with the used of appropriate navigations.

The heading of the webpage of Figure 2.2.4.1 is attached to links that can lead viewers to the pages that providing details for travel guide, interesting getaways, shopping centres, and accommodation and so on which are available in Ipoh city. The introduction, description, photos, economy and so on are all packed in the page.

Additionally, the page also provides the city map of Ipoh where the city map can be downloaded and printed out.

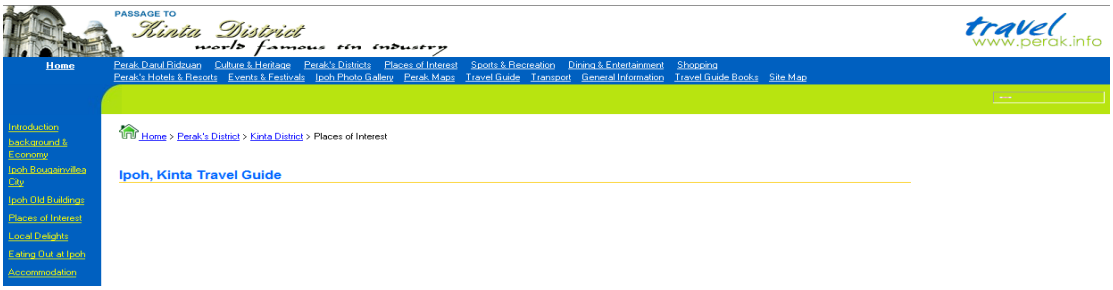


Figure 2.2.4.1: Ipoh Tourism Heading

The Figure 2.2.4.2 shows the interesting getaways around Ipoh City. Each of the location is displayed in the page and has a specific link attached to the page. Therefore, one can open every link to visit each of the attached pages and get to know more about every location. Using this method, every location has a specific page for its description and photos. Hence, more information can be packed in each page for a particular destination. Just click and view and is that easy.

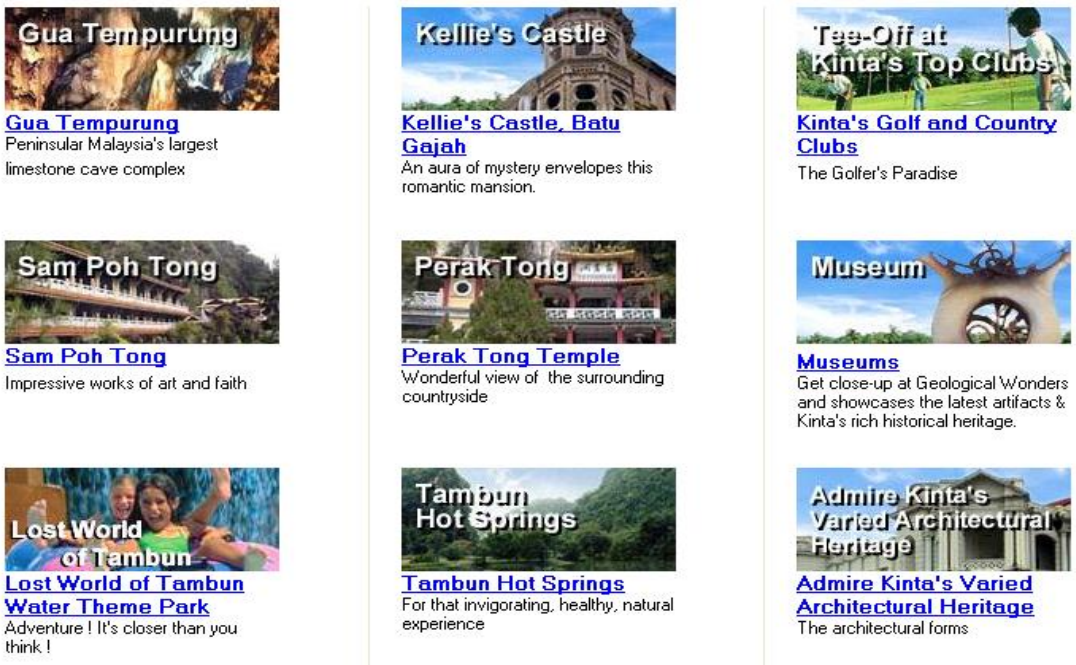


Figure 2.2.4.2: Ipoh Tourism Interesting Getaways

The page shown in Figure 2.2.4.3 is also linked to the main tourism portal of Malaysia. The viewers can get for further information from here. The links of Perak Tourism and Tourism Malaysia as shown in the image below are the information centres for further details about tourism in Malaysia.

Figure 2.2.4.3: Ipoh Tourism Special Links

2.2.5Survey on the existing system that similar with existing Kinta Tour Guide Webpage

The website of Ipoh Travel Pod [16] is one of the selected webpage with creative design for Ipoh Tourism. The images shown in Figure 2.2.5.1 until Figure 2.2.5.7 are the parts of the webpage that make the page interesting and convenient for the viewers.

The Figure 2.2.5.1 is the heading of the webpage. The figure obviously shows that the page can be shared and attached to ‘Facebook’. The sharing method with Facebook is a wise method as Facebook is the worldwide sharing portal. When viewers click on ‘Connect with Facebook’ hyperlink, viewers will be led to the Facebook’s Login Page.

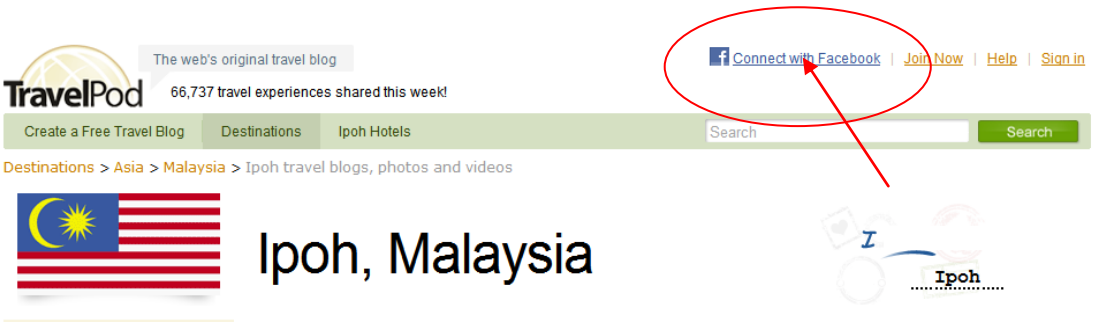


Figure 2.2.5.1: Ipoh Tourism Heading

The Figure 2.2.5.2 shows that the page is linked to a collection of interesting photos of Ipoh. Many photos are shared in the page but the photos are not compiled in a slide show. Instead, the series of photos is collected in a page and is linked to the main webpage. Hence, the design would not make the main page looked messy. The design is functioning like a page of photo gallery.

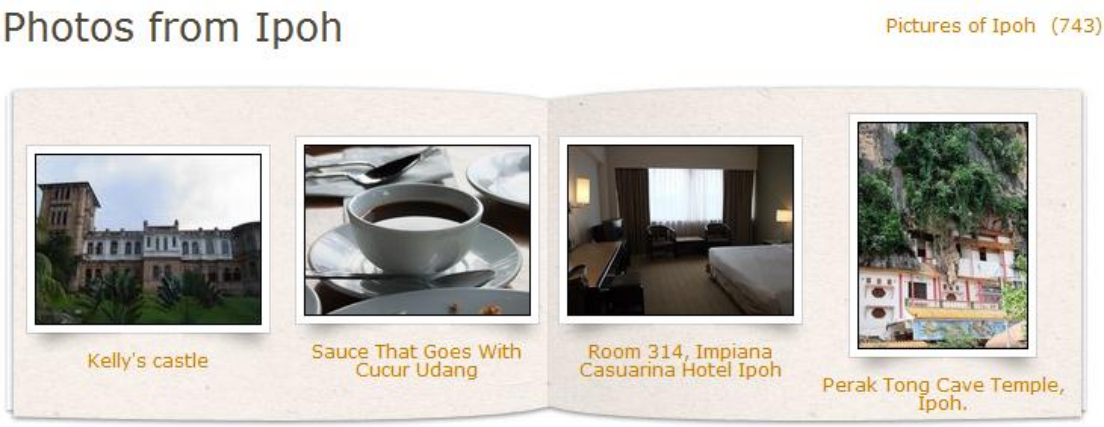


Figure 2.2.5.2: Ipoh Tourism Photos

The Figure 2.2.5.3 shows the part of forum and blog within the main webpage. In other words, the design does not just make page available to be shared via 'Facebook' but also in chatting portals such as blog and forum. The bloggers from all over the world can communicate in the blog about Ipoh or giving comments through the forum. The design has made the page more fun and interesting. Bloggers can exchange information and experiences within the blog. Bloggers can share information and experiences among bloggers.

Figure 2.2.5.3: Ipoh Tourism Forum

The Figure 2.2.5.4 shows that the page is also attached to travel services. The 'Travel Service' offers a very convenient way for the interested tourist to get information about transportation, accommodation, interesting things to be done in the city of Ipoh and so on. One just has to click and open the attached link and collect all

the useful details in the link and then close the attached link, only within minutes. The used of hyperlink navigation is simple, fast and effective.

Figure 2.2.5.4: Ipoh Tourism Travel Services

The Figure 2.2.5.5 shows the page also contains information of Malaysia where viewers can even get the information about currency exchange of ringgit Malaysia also. The information provided is absolutely will be helpful information for the interested foreigners to plan for foreigners' budget to pay a visit to Ipoh.

Figure 2.2.5.5: Ipoh Tourism Country Information

The Figure 2.2.5.6 shows the page even offers an application where viewers can ask questions straight to the travellers who already had the experience visited the Ipoh City.

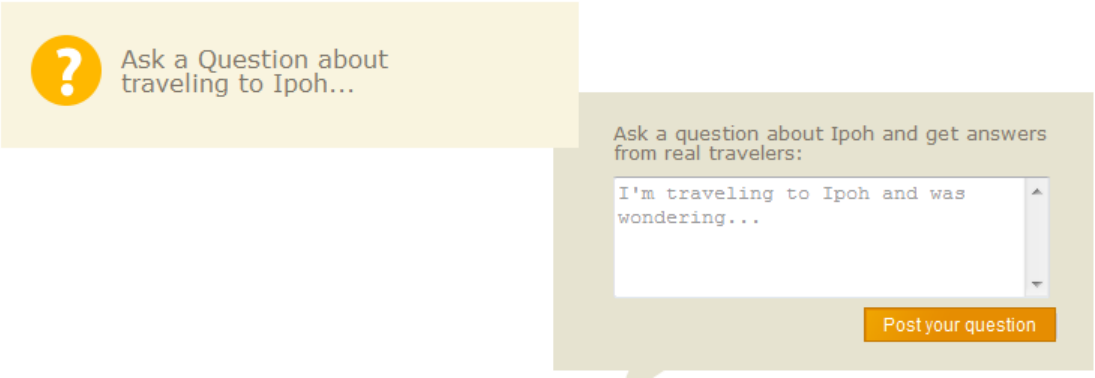


Figure 2.2.5.6: Ipoh Tourism Viewers' Information

Moreover, Figure 2.2.5.7 shows the page include the map of the Ipoh City. Just have a click and open the link. The map is even available for being downloaded for printing. Perhaps, a map is the most important tool for a traveller. Travellers can refer to the map for the routes to reach travellers' destinations.

Figure 2.2.5.7: Ipoh Tourism Map

2.3 Heuristic Evaluation of Human Computer Interaction

Heuristic Evaluation is done based on 3 designed rules which are Golden Rules, Heuristic Rules and Norman's Rules. However, each of the rules has its own application. The most popular ones are Nielsen's ten heuristics for usability evaluation, Shneiderman's eight golden rules of interface design, and Norman's seven principles for transforming difficult tasks into simple ones. In Heuristic evaluation, several main aspects has been highlighted and they are the number of

tasks completed successfully by the user, length of time to complete the test tasks, number of errors, and time spent recovering from errors [17].

2.3.1 8 Golden Rules of Interface Design

Golden Rules of Interface Design rules have been obtained from the text designing the User Interface by Ben Shneiderman. Shneiderman proposed this collection of principles that are derived heuristically from experience and applicable in most interactive systems after being properly refined, extended, and interpreted. Golden Rules of Interface Design rules are generally thought to be common across all computer hardware and software environments. Golden Rules of Interface Design rules also apply across all interface types and styles. Golden Rules of Interface Design rules have evolved over time through many years of interface design efforts, research, testing, and user feedback in computing environments. A research has proposed that this collection of principles that are derived heuristically from experience are applicable in most interactive systems after being properly refined, extended, and interpreted to improve the usability of the application and creating an interactive system [18]. Following are the rules and the rules' description [19].

Here is a collection of design principles base on Shneiderman's "Eight Golden Rules of Interface Design". In trying not to make this post sound like a university study, these 8 Golden Rules had dumped down the language a bit, while trying to keep the heart of the message the same [19].

2.3.1.1 Strive for consistency

Try to make it so the user intuitively knows what to do because they've seen the same situation before throughout your interface. This means making terminology the same throughout and making sequences of actions be the same in similar situations. A good example of this is Mac's operating system OSX. Everything ties

into one another. Their progress bar has the same look and feel as a program window. Any confirmation windows always have an ‘ok’ and a ‘cancel’ button. This holds true for pretty well every operating system out there [19].

2.3.1.2 Enable frequent users to use shortcuts

The used of shortcuts allow the users doesn’t have to work so hard to get from point A to B. The used of shortcut is especially valid for users that use the interface on a regular basis. Something to consider might be, abbreviations, function keys, hidden commands and automated actions. Yahoo mail does a good job of this. Users can press a letter like ‘n’ to start a new message, or ‘f’ to forward a message [19].

2.3.1.3 Offer informative feedback

For every action that the user does, there should be some sort of feedback, either good or bad. For more frequent and minor actions the response can be minimal. For infrequent and major actions the feedback should be more substantial. Yahoo mail is used as an example again. If users try and enter a bogus username or password, the webpage gives users feedback by letting users know why users couldn’t log in [19].

2.3.1.4 Walk uses through more complicated tasks

When users have an action that requires several steps, be sure to separate the steps into a logical beginning, middle and end. After each step is sure to give feedback that will clarify that the step was done correctly and users can move on to the next step. At the end of all the steps be sure to let the users know that users are completed and that users have finished all the requirements. An example of this

might be an installation wizard on users' operating system, or any checkout shopping cart on the web [19].

2.3.1.5 Offer simple error handling

Design the system as much as possible so the users cannot make a serious error. If an error is made, the system should be able to detect the error and offer simple, comprehensible solution for handling the error [19].

2.3.1.6 Permit easy reversal of actions

Give a way for the users to undo an error. Undo function will help keep the users at ease if users know that not everything has to be perfect. Undo function will encourage further exploration of users interface. Users might want to place an undo feature when dealing with single actions, a data entry or a complete group of actions. Any word processor is a good example of this. Ctrl + z are probably one of the most popular key commands out there [19].

2.3.1.7 Make the user feel in control

Experienced users always want to feel like users are in control of the system. Make sure the design makes the users feel in control and not just responding to a situation. I-Google does a good job of this. The system allows users to customize users' workspace, and put only what users want up front [19].

2.3.1.8 Keep it simple

People have a limited short-term memory. Having to keep track of several things at once can leave users frustrated or incapable of using users interface. Try and consolidate multiple pages, reduce unneeded motion, and generally just keep things simple. Keep things simple will go a long way to help user's frustration level. Again Google nailed this [17]. Granted all these seem like common sense. Users are surprised though at how often some of these are missed. So keep an eye out on users interfaces [19].

Analyse

The 8 Golden Rules principle is mostly applied to design interface. 8 Golden Rules principle is important to be used to design webpage that is easier and convenient for users. 8 Golden Rules principle is also used to standardize all the webpage designs within the Internet to avoid confusions among the users. The rules aim to let the Internet users to accelerate the speed of net surfing as well as keeping them simple. Besides, a webpage is designed to be under control of every user around the world and designed to have minimum possible errors which can be done by the users to protect the system.

2.3.2 Ten Usability Heuristics

Below are the ten general principles retrieved from the website above. The rules are for user interface design which has been suggested by Jacob Nielsen. The rules are called heuristics because the rules are more in the nature of rules of thumb than specific usability guidelines [20].

2.3.2.1 Visibility of system status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time. Visibility of system status is related to the header and the main title of the webpage. Visibility of system status is really important as the system status is first impression of every page for viewers. The system status must be clearly mentioned to give a clear image of the contents in whole page. Hence, if the page is about Ipoh Kinta, the title must be straight forward and the image of the header must be related to Ipoh. The Figure 2.3.2.1 is the header for the webpage of Ipoh Kinta. The header should be enhanced as the photo of Kuala Lumpur City used is unsuitable. It brings about confusion in the first impression [20].

Figure 2.3.2.1 Ipoh Tourism Header

2.3.2.2 Match between system and the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order. For example as a travel guide webpage of Ipoh Kinta, the idea to attach the page with information that contains interesting destinations, foods and accommodations which are available in Ipoh is logical for the webpage as shown in Figure 2.3.2.2. Viewers will expect to have that information in the page [20].

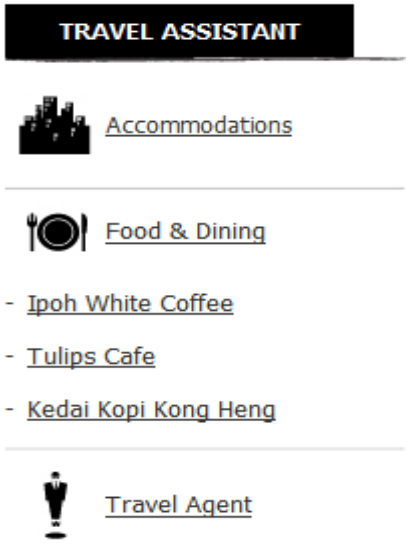


Figure 2.3.2.2 Ipoh Tourism Content

2.3.2.3 User control and freedom

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo. For example in the Figure 2.3.2.3, a viewer can click the 'Accommodations' button available in the page and the hyperlink navigation will lead the viewer to an attached page with ample information various hotels in Ipoh. Then, the viewer just has to click on 'x' of the page to close the page and back to the homepage [20].

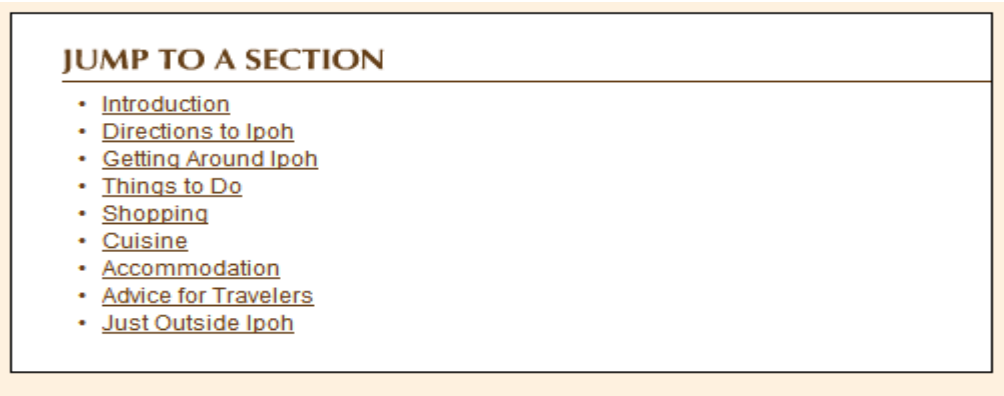


Figure 2.3.2.3 Ipoh Tourism Content

2.3.2.4 Consistency and standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions [20].

2.3.2.5 Error prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action [18].

2.3.2.6 Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The users should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate. For example in the Figure 2.3.2.6, the webpage of Ipoh Kinta should reduce the contents which are too wordy and add in more attractive and colourful photos as well as creative design [20].

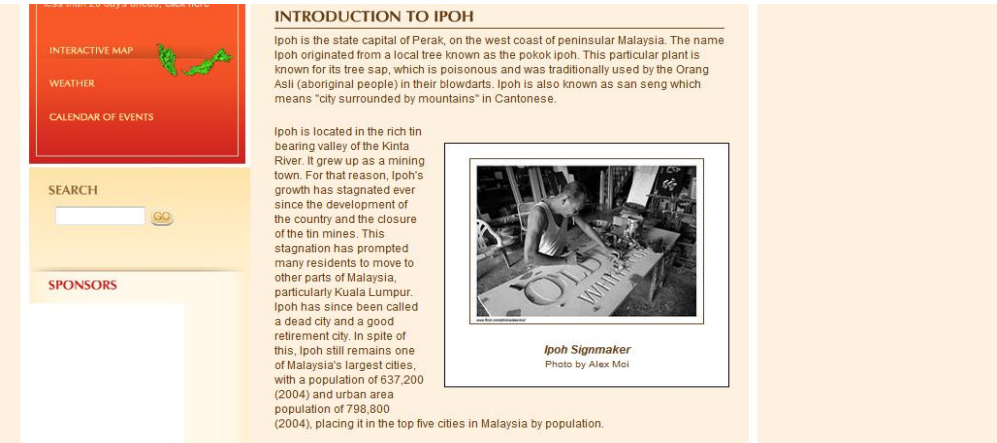


Figure 2.3.2.6: Introduction of Ipoh Tourism

2.3.2.7 Flexibility and efficiency of use

Accelerators - unseen by the novice user - may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions [20].

2.3.2.8 Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes the information's relative visibility. For example in the Figure 2.3.2.8, the contents with too much word in the Ipoh Kinta page should be summarized to reduce the amount of words. Cut off the irrelevant sentences and the points that can be represented by photos or figures are encouraged [20].

JUST OUTSIDE IPOH (travel suggestions)

Pangkor is a fishing village island with many beautiful beaches. There are two famous resorts when mentioning Pangkor: Pangkor Laut (which is on a small 1 resort adjacent island) and Pan Pacific resort. Nearby places such as Lumut, Sitiawan and Pangkor Island offer very good seafood.

Cameron Highlands is Peninsular Malaysia's most famous highland destination. Many vegetable, strawberry and tea farms are to be seen there. The cool weather and beautiful scenery makes it a popular hideaway from the warm weather in the rest of the state. There is a toll-free road to Cameron Highland from Simpang Pulai located at south of Ipoh. It will take about an hour to reach there from Ipoh by car.

Gua Tempurung or Tempurung Cave, Perak's best kept secret, is a must visit if you are an adventurous person. It is located at Gopeng, just 24km south of Ipoh. There are many unique and fascinating limestone formations in the cave. There are a few challenging cave exploration packages that are very exciting where you need to climb, crawl and slide. There is a shuttle bus and tour service at Medan Gopeng bus station in Ipoh. It takes about 30 minutes to get there.

Lata Kinjang waterfalls is a majestic waterfalls that is visible from the North-South highway, after passing the Tapah exit.

Taiping, was the first major township developed by the British in Malaysia. It is a very peaceful and quiet town. Its attractions are beautiful Maxwell Hill (or now known as Bukit Larut) and Taiping Lake Gardens, and Taiping Zoo.

Tg. Tualang is located south of Ipoh and offers very good seafood. Also if you want to see a tin dredger-turned-museum, head to this town. It is still yet to be opened, but you can take a geek at this machine from a far.

Figure 2.3.2.8: Ipoh Tourism Contents

2.3.2.9 Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution [20].

2.3.2.10 Help and documentation

Even though the system is better if the system can be used without documentation, the system may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large [20].

Jacob Nielsen originally developed the heuristics for heuristic evaluation in collaboration with Rolf Molich in 1990 [Molich and Nielsen 1990; Nielsen and Molich 1990]. Jacob Nielsen since refined the heuristics based on a factor analysis of 249 usability problems [Nielsen 1994a] to derive a set of heuristics with maximum explanatory power, resulting in this revised set of heuristics [20].

2.3.2.11 Updated Findings

Jacob Nielsen will present Jacob Nielsen newest usability guidelines in the tutorial on Fundamental Guidelines for Web Usability at the Usability Week 2009 conference in Las Vegas and Berlin [20].

Analyze

The Heuristic Rules principle is applied for usability evaluation. By following the rules, the contents in a page can be showed effectively and provides a better communication between the webpage and the viewer. In other words, one can easily understand the details that a web designer wishes to share or show. Heuristic Rules principle is also packed with needed information and easy to be searched as well as can attract the enthusiasm of viewers. Hence, Heuristic Rules principle is usually used to evaluate a design and ideas are figured out for webpage enhancing effort.

2.3.3 Norman's Principle

Norman has come up with a few basic principles that will help designers design better products. By using these design principles and taking them into consideration when designing everyday products, it can help prevent simple but often overlooked design problems with everyday products [21].

2.3.3.1 Visibility and Feedback

The visibility principle states that designers should make visible the important aspects of a system. Ideally, the actions that a user can perform on a device should be obvious by just looking at the device itself. The feedback principle states that the effect of all user actions should be immediately obvious through some kind of system feedback such as audio or visual cues, or any other form that is easy to detect [21].

2.3.3.2 Natural Mapping

There should be a clear relation or mapping between intentions and possible actions and between actions and actions' effect on a system or device. Norman used to start Norman first lecture on design by asking a student to turn off a given set of lights in the classroom. Usually there are many lights and many switches in a classroom. Finding out which switch corresponds to a given set of lights can be rather hard [21].

One possible, solution is to arrange the light switches in the same pattern as the lights on the ceiling. Users can have a small plate with the room layout printed on top of it, and users can put the light switches in places that directly correspond to the physical location of the lights that users control. In essence this is what Norman has in his house. It is true that every house has different layout and will need a different switch layout thus making the initial installation difficult. However, the task is not impossible. If users think of how many times users hit the wrong switch and spend time correcting the error afterwards, probably it might be worth the effort of getting the mapping straight from the beginning [21].

The problem of mapping gets even worse as the complexity of the device increases. Even the simplest electronic watch has about a dozen functions such as tell date and time, stopwatch, set date and time, and so on. At the same time it comes with about 4 buttons. It is not at all obvious what the mapping is by just looking at the watch [21].

2.3.3.3 Constraints

There are several kinds of constraints: physical, semantic, logical, and cultural. Ideally some or all of these should be used to prevent unwanted actions or sequences of actions that should never be executed on a system or device. For example, one should not put metal plates in a microwave oven. This action is difficult to prevent unless the oven has a metal detector inside which will increase its

price. Thus, the only preventive mechanism that the designers can use is a warning label: "Do not put metal objects in the microwave" [21].

There are other actions, however, that can be prevented easily if the power of constraints is utilized. For example, a car door should not be locked if we left our keys inside the car. The designers must make sure that when the keys are inside the ignition switch the door cannot be locked. The army uses physical constraints to increase security of weapons. It is not possible to launch a nuclear missile unless two keys are turned on at the same time. The keyholes for these keys are physically separated so that it is impossible for a single person to perform the launch [21].

2.3.3.4 Design for Error

Every now and then users hear about an accident which was caused by a "human error". One example that Norman gives is the Soviet Union's Phobos 1 satellite which was lost on its way to Mars not long after launch. Later it was found that the cause for the error was an operator who sent a sequence of digital commands to the satellite but mistyped a single character. Unfortunately, this triggered a test sequence stored in ROM which was supposed to be executed only when the spacecraft was on the ground. The wrong sequence set the satellite in rotation and it was no longer possible to resume control over it; it was lost in space. Science magazine classified the accident as "malignant bad luck" [21].

The report is really strange and Norman rightly so critiques that it should not be called bad luck but rather bad design. The designers of the satellite probably invested a lot of time to make sure that the communication systems are safe from external interference and that the spacecraft is free from mechanical problems. However, the designers never bothered to look into what kind of errors can be caused by humans [21].

Norman argues that the behaviour "human error" is far easier to predict than some other kinds of errors like mechanical and electrical. There are certain models and patterns in the way people make errors and if errors are accounted for in the initial design the number of "human errors" will be dramatically decreased. Probably users should even change our whole attitude towards errors. Users should say that errors occur because the design is bad and not because the users are not careful and made an error [21].

In a well-designed system there should be a way to undo an erroneous interaction and in the rare cases when the action cannot be reversed there should be a warning which is not easy to ignore. Also, if the result of an irreversible action can be potentially disastrous it should not be easy to perform this action in the first place. For example, in computer systems it should be relatively harder to remove a file than to rename the file. The user should be forced to do something different and usually harder than normal [21].

Even if designers do designers' best in designing for error people will still continue to make errors. Certain type of errors, called slips are almost impossible to prevent. Slips occur when designers have a clear idea of what designers want to achieve but for some reason designers use the wrong tool or perform a different action. Slips are done at a subconscious level and happen almost automatically. Even the most experienced people make slips. Therefore, designers should make error discovery possible. The error discovery can be done with appropriate observable feedback to the users so that users can at a later time, discover users' error and correct the errors by using the undo functions [21].

Here is a brief summary of the 4 most important designs for error principles that Norman suggests [21]:

- Understand the causes of error and design to minimize those causes.
- Make it possible to reverse actions - to "undo" actions - or to make it harder to do what cannot be reversed.
- Make it easier to discover the errors that do occur, and make them easier to correct.

- Change the attitude toward errors. Think of an object's user as attempting to do a task, getting there by imperfect approximations. Don't think of the user as making errors; think of the actions as approximations of what is desired

2.3.3.5 Consistency

The consistency principle allows users to get used to a product or system and therefore once users learn how to use it, users can continue to use it because given actions produce the same results so it is consistent every time. Consistency must also be taking into consideration as to other similar products or systems in the market. For examples, VCR, the key pad of cellular phones, and the layout of retail chains such as Home Depot and Starbuck [22].

Analyze

The Norman's principle is used to make the hard task easier for the web users. All the complicated applications are made easier to be operated by every user. The designed page will lead the users step by step in order to explore the whole page. Once the users have gone to the particular page, users can figure out how to open for what users need and the page can tolerate a certain human error. The designed page provides a chance for the user to make everything right. The designed page is a good design.

2.3.4 Summary of three heuristic evaluation of Human Computer Interaction

The summary of three heuristic evaluation of Human Computer Interaction includes [23]:

- "Rules of thumb" or educated guesses that reduce or limit the search for solutions in domains that are difficult and poorly understood.
- May not be applicable to every situation, but provide a useful checklist or summary of the essence of design advice.
- Any designer following these simple rules will produce a better system than one who ignores the designer.
- The most popular ones are Nielsen's ten heuristics for usability evaluation, Shneiderman's eight golden rules of interface design, and Norman's seven principles for transforming difficult tasks into simple ones.

2.4 Proposed System

According to the problem statement highlighted in Chapter 1: Introduction, Chapter 1 indicates that the existing webpage of Kinta Tour Guide require enhancement to fulfil its goal as a tourism webpage to promote information sharing and at the same time able to attract the attention of the viewers. The project needs to be informative and attractive. In additional to that, decision has been made to enhance the webpage with Jacob Nielsen's Heuristic Rules. The Chapter 1 also consists of discussion regarding the weakness of the existing system has been done and a comparison of usability between existing systems is made. Then questionnaire survey has been brought out with 30 chosen respondents. These discussion and results from the survey will be used as reference during the enhancement process.

From the studies of the existing system, there are several weaknesses in the existing system which is highlighted to be upgraded by applying the suitable rules within the Jacob Nielsen's Heuristic Rules.

a) Visibility of System Status: A suitable banner will be inserted into the enhanced system in order to avoid confusion. The banner will have an image of Ipoh City.

b) Match between System and the Real World: The words and language used will as simple as possible and clear for experience users or novice users.

c) User Control and Freedom: The contents of the page will be separated and attached to different hyperlinks for each specific subtopic such as homepage, accommodations, foods, map and so on. This is done in order to avoid the contents of the page to be packed into a single page like in the existing system which makes the page too long and looked messy.

d) Consistency and Standards: This rule will be merged with the 'User Control and Freedom'. The flow of contents will be standardized.

e) Error Prevention: A 'Reset' button function will be applied in the enhanced system in order to allow users to reset the information when input wrongly.

f) Reorganization Rather than Recall: The existing webpage is too wordy. It is more effective to insert more related and interesting photos to promote the tourism destination. Photos will help viewers recognize the specific destination faster. A photo can represent a thousand words.

g) Aesthetic and Minimalist Design: The design of words font size, type of font, layout and colours are enhanced for viewers' maximum visibility. In the other words, the words within the contents of the page can be clearly seen and read by the viewers while the colour contrast of the page is designed to be suitable for all range of viewers include the viewers who suffer from colour blind.

h) Help Users Recognize, diagnose and Recover: A pop out error message box will be available in the enhanced page to help users recover from any possible errors that may occur. For example, if the user fills in the user's information form wrongly, the form cannot be submitted and an error message box will pop out.

In additional to that, besides enhancing the existing system with the rules, the enhanced webpage will be attached with tourism packages offered by local tourism agencies. The idea requires cooperation from the specific organization. The targeted companies include organization from food, accommodations, resorts and so on. In

other words, the design of a webpage which comprises of advertisements is suitable for tourists. The advertisement section is attached with organizations' logos in the enhanced webpage. The design can be concluded that the enhanced system based on the Jacob Nielsen's Heuristic Rules is more interesting and convenience for the viewers.

2.5 Conclusion

The Nielsen's Heuristic Rules is the most suitable rule to be applied in the Enhancement of The Tour Guide Webpage Based on HCI Element for Kinta Tour Guide Webpage project as the Nielsen's Heuristic Rules is mainly used for usability evaluation. The purpose of the used of Nielsen's Heuristic Rules applied is because the project is more to the evaluation and up gradation of an existing webpage. In other words, a chosen webpage will be evaluated and then will be improved according to the Nielsen's Heuristic Rules.

CHAPTER 3

METHODOLOGY

In this chapter will discuss about the methodology that will be using in the development of Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage. For develop Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage, the Research Methodology method was choosing because Research Methodology has several characteristic that is suitable for the development of the Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage. There have three section consists in this chapter. The first section explains about the introduction of the Research Methodology method and the reason to choosing the Research Methodology approach. The next section discuss about the implementation of Research Methodology method in the Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage development. The last section will elaborate the hardware and software that was used in the development of the Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage.

3.1 The Justification of Research Methodology Process

The Research Methodology process is chosen to be the methodology for the enhancement of Tour Guide Webpage based on the HCI elements for Kinta Tour Guide Webpage as shown in Figure 3.1.1. Through Research Methodology process, the webpage enhancement is mainly done by survey base on Jacob Nielsen's

Heuristic Rules. The survey is done by distribution of questionnaire forms to the chosen 30 respondents. The respondents comprise of 15 UMP students who consist of non-IT background, 5 UMP FSKKP lecturers, 5 students who are from IT background, and 5 randomly chosen students. The fundamentals of the Research Methodology process thus include:

3.1.1 Planning Phase

Planning Phase defines the system and methods which are planned to be used for the webpage enhancement base on the Heuristic Usability Rules.

3.1.2. Analysis Phase

Analysis Phase uses proper surveying process to evaluate the existing webpage by using questionnaire.

3.1.3. Implementation Phase

Implementation Phase concentrates on the feedbacks from the analysis. The webpage enhancement will be done according to the feedbacks, based on the Heuristic Rules.

3.1.4. User Design Phase

User Design Phase uses workshops to model the system's data and processes as well as to build a working prototype of the enhanced webpage. The implemented ideas are applied in the design.

3.1.5. Testing Phase

Survey is done to the designed prototype during Testing Phase. Testing Phase is the final user testing and implementation of the application system.

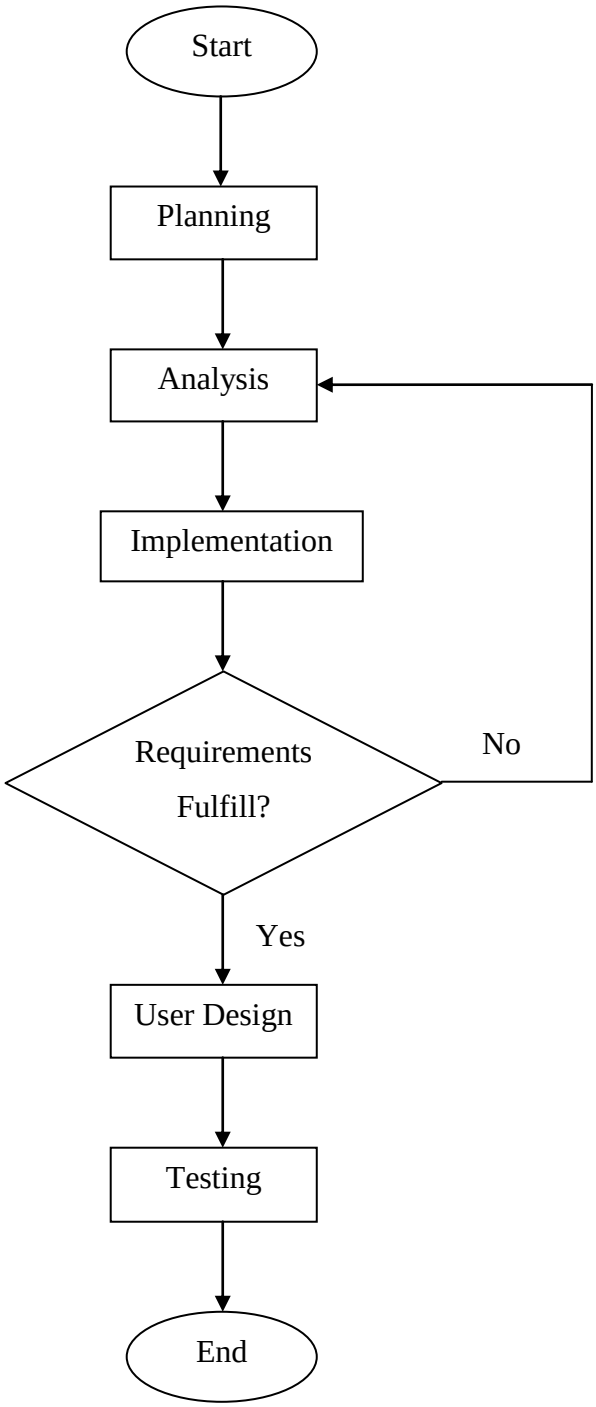


Figure 3.1.1: Research Methodology Process Flowchart Diagram

3.2 Implementation of Research Methodology Process in the Kinta Tour Guide Webpage

Research Methodology process phases will be implemented into the Kinta Tour Guide Webpage which consist of planning phase, analysis phase, implementation phase, user design phase and testing phase.

3.2.1 Planning Phase

The Planning Phase focuses mainly on required project planning work. A well defined project planning is significant for a successful computering project. On the other hand, a weak project planning and analysis will lead to project failure. Most project planning is conducted as part of the Integration Management work, which includes defining the processes necessary to identify, define, combine, unify, and coordinate all project activities for successful project deployment.

a. Plan to search for existing websites in Internet.
b. Identify an existing website that needs enhancement.
c. The Kinta Tour Guide webpage is chosen to be the existing webpage for enhancement.
d. Determine the best Design Rules for the existing webpage enhancement.
e. The Nielsen’s Heuristic Rules is planned to be used to enhance the chosen existing Kinta Tour Guide Webpage. The ten general principles for user interface design which are called "heuristics" because the ten general principles are more in the nature of rules of thumb than specific usability guidelines [24].

- **Visibility of system status**

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time [25]. This rule will be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For instance, Figure 3.2.1.1 shows the heading of the tourism Penang webpage [26]. The header is very important as the header is first impression of every page for viewers. The header must be clearly mentioned to give a clear image of the contents in whole page. Hence, if the page is about Tourism Penang, the title must be straight forward and the image of the header must be related to Penang.

Figure 3.2.1.1: Header of Tourism Penang Website

- **Match between system and the real world**

The system should speak the user's language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making

information appear in a natural and logical order [25]. Match between system and the real world rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For example, Figure 3.2.1.2 shows the Malaysia Tourism webpage's contents [27]. As a travel guide webpage of Malaysia, content is logic for the webpage to attach with information for interesting destinations, activities and travel packages, and so on. The viewers will expect to have that information in the page.

Figure 3.2.1.2: Malaysia Tourism Contents

- **User control and freedom**

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo [25]. User control and freedom rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For instance, Figure 3.2.1.3 shows the buttons of contents that are available for the viewers to click on and lead viewers to the page wanted. Then, the viewer just has to click on 'Home' of the page to back to the homepage of Blog Design Webpage [28].

Hence, user control and freedom rule will let the users to go through the webpage freely.

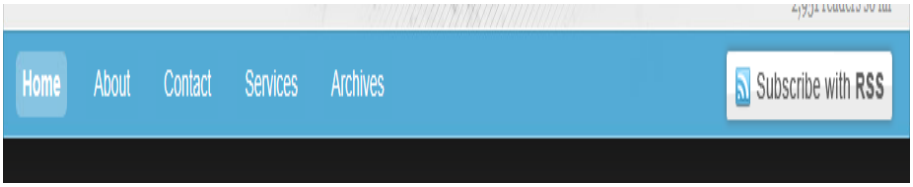


Figure 3.2.1.3: Blog Design Webpage Contents

- **Consistency and standards**

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions [25]. Consistency and standards rule will be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For example, Figure 3.2.1.4 and Figure 3.2.1.5 show the options of Microsoft Word and Microsoft Power Point header which using the same style toolbar with same menu options. The consistency and standard style of the Microsoft Office allows users to have a clear and understanding function of each option [29].

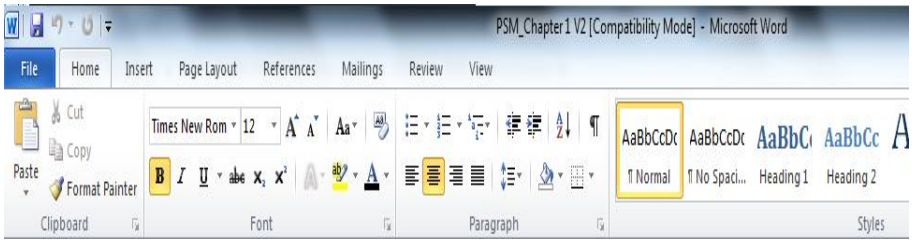


Figure 3.2.1.4: Options of the Microsoft Word Header

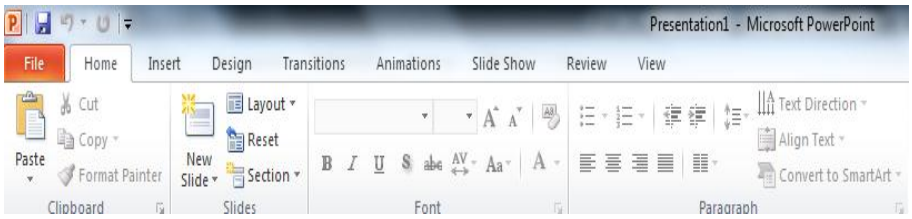


Figure 3.2.1.5: Options of Microsoft Power Point Header

- **Error prevention**

Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action [25]. Error prevention rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For example, Figure 3.2.1.6 shows an error message popped up when the viewer's click on 'Submit Comment' button where viewers insert nothing at the textbox provided which required of the information. The function of the error message is a careful design which prevents viewers from a problem occurred in Hospital Website [30]. The Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage should have this system.

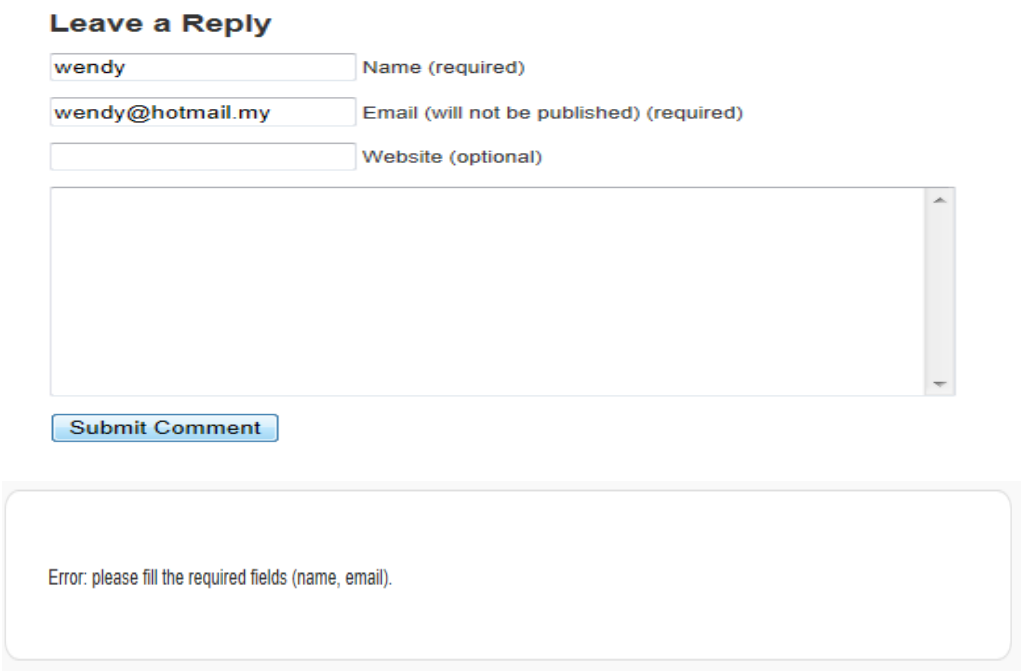


Figure 3.2.1.6: Error Message of the 'Leave Comment' Section

- **Recognition rather than recall**

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate [25]. Recognition rather than recall rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For example, Figure 3.2.1.7 shows a highlighted option of the action chosen by the viewers. The viewers could recognize where the page where the viewers are. Recognition rather than recall rule may minimize the viewers; memory load in order to remember which page the viewers are of the Greenwich Hospital Tale new Heaven Health webpage [31].

Figure 3.2.1.7: Highlighted Option of Action

- **Flexibility and efficiency of use**

Accelerators unseen by the novice user may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions [25]. Flexibility and efficiency of use rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For example, Figure 3.2.1.8 shows the options of the selected action from the toolbar. The function of the previews of a column selected may increase the speed of the interaction between inexperienced and experience users. The function of the previews of a column selected may also reduce the place needed to show the sub-information under one category of Pantai Holding Bhd. webpage [32].

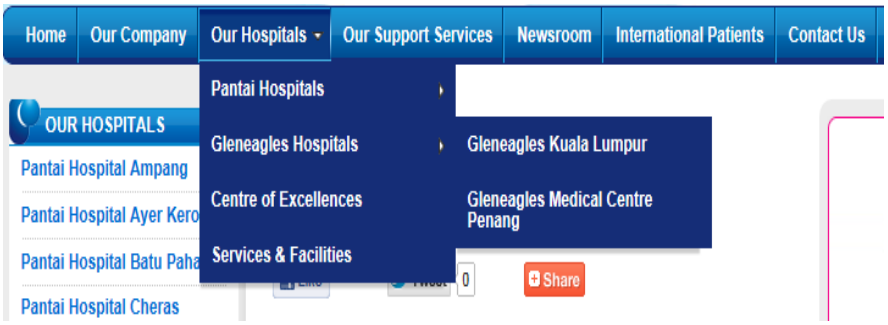


Figure 3.2.1.8: Options of Selected Action

- **Aesthetic and minimalist design**

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility [25]. Aesthetic and minimalist design rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For instance, Figure 3.2.1.9 shows the About Australia webpage's information text layout. The visual layout is respected to the principles of contrast, repetition, alignment, and proximity with the relevant units of information which is diminished to their relative visibility [33].

Figure 3.2.1.9: Information Text Layout

- **Help users recognize, diagnose, and recover from errors**

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution [25]. Help users recognize, diagnose, and recover from errors rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For example, Figure 3.2.1.10 shows a list of languages that allow difference races of viewers choose for. Language selection function could provide viewers an immediate feedback with specific instructions. Each viewers of the webpage will feel comfortable with an understanding language chosen for About Australia webpage [33].

Figure 3.2.1.10: Language Changed of the Webpage

- **Help and documentation**

The designed system is better if the system can be used without documentation, it may require help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too

large [25]. Help and documentation rule is planned to be applied in the Enhancement of The Tour Guide Webpage based on HCI Element for Kinta Tour Guide webpage.

For example, Figure 3.2.1.11 shows a 'Help' button which can provide users a 'Help' tip which is displayed on the top of the right side of Microsoft Word. The 'Help' function is to answering the most likely question about a field or instructions [34].

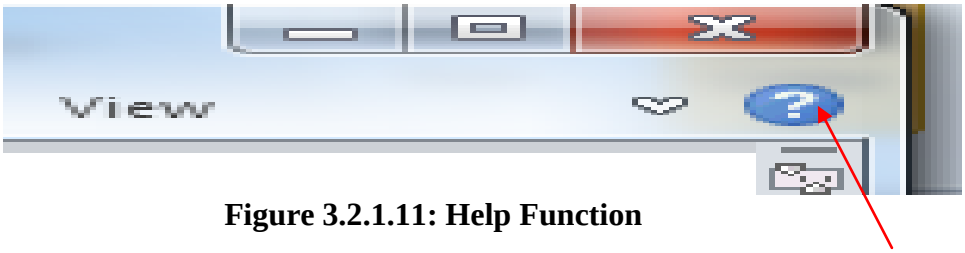


Figure 3.2.1.11: Help Function

f. The survey questions are planned and prepared for questionnaire form as shown in Appendix B.
g. 30 people will be chosen to go through the questionnaire survey regarding the chosen existing Kinta Tour Guide webpage. The respondents comprise of 15 UMP students who consist of non-IT background, 5 UMP FSKKP lecturers, 5 students who are from IT background, and 5 randomly chosen students.
h. Enhancement will be done on the Kinta Tour Guide webpage as the prototype, taking account of the comments and responses given by the 30 respondents to help in the enhancement effort.
i. Second survey will be brought out to the prototype. The prototype is tested by showing it to the 30 respondents who involved in the first survey.
j. The comments and responses to the prototype by the 30 respondents will be taken account to bring out further enhancement.
k. The product will be finalized based on the heuristic rules according to the survey result.

3.2.2 Analysis Phase

Analysis Phase is the second phase of the project development. Prototypes are developed by using the software tools described in Table 3.2.3.3.1. The development of prototypes and techniques of the system is based on the responses and comments from the chosen Internet users via questionnaires. Survey forms are distributed to 30 Internet users, asking for their opinions about the existing webpage of the Kinta Tour Guide as shown in Appendix A. Out of the 30 chosen respondents 15 UMP students who consist of non-IT background, 5 UMP FSKKP lecturers, 5 students who are from IT background, and 5 randomly chosen students. Then, the prototype of the Kinta Tour Guide webpage enhancement will be done based on the 30 Internet users' and tourists' comments in the survey form according to the heuristic features.

3.2.3 Analyze of the Design Rules for Implementation Phase

Webpage enhancement is done by Design Rules. Design Rules includes Shneidermen's Rules, Norman's Eight Golden Rules and Nielsen's Heuristic Rules. However, the Nielsen's Heuristic Rules is chosen for the enhancement of Kinta Tour Guide webpage for its suitability in usability evaluation. The webpage is being evaluated according to the rules and enhancement is done according to the evaluation. The weaknesses of the existing webpage are enhanced by applying the Nielsen's Heuristic Rules. The Nielsen's Heuristic Rules is applied in order to deal with the weaknesses within the existing webpage accurately and accordingly. Therefore, the webpage can be enhanced faster and a better design can be produced. A total of 30 people will be chosen to do a survey regarding the existing webpage. The survey is carried out using questionnaire. The questionnaire comprises of 10 questions regarding the existing webpage and every comment from the surveyors will be considered to be applied in the webpage enhancement.

3.2.3.1 Software and Hardware Tools

Several software and hardware have been used to in the enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage. Hardware is the physical aspect of the computer, while software is a general term or part for the various kinds of programme used to operate computer and other devices.

3.2.3.2 Hardware

The hardware tools used for the enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage system is according to the system requirement of the chosen development tools. Table 3.2.3.2.1 shows the list of hardware used during the development of the enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage.

Table 3.2.3.2.1: Hardware Tools

Hardware	**Specification**	**Purpose**
Laptop	- Intel(R) Core(TM)2 Duo CPU T6500 @ 2.10GHz - 4 GB RAM - 320 GB Hard Disk	To run the operating system for development To run the software tools To execute codes
Printer	Canon PIXMA iP1300	Print out the documentation
External Hard Disk	Eztec 300GB	Backup data
USB Flash Disk	S.L.I.A 4 GB Data Traveller	Transferring data

3.2.3.3 Software

There are variety types of language used in the development of the Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage such as HyperText Markup Language (HTML), Cascading Style Sheet (CSS), JavaScript, JQuery, and ASP.Net. Thus, the development tools are selected based on the chosen programming and script languages' environment. Table 3.2.3.3.1 shows the list of software applied during the development of the enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage system.

Table 3.2.3.3.1: Software Tools

Software	Purpose
Microsoft Visual Web Developer 2010 Express	System interface design and coding implementation
SQL	Database platform
Apache HTTP Server	Web server platform
Microsoft Office - Microsoft Office Word 2010 - Microsoft Office Power Point 2010 - Microsoft Office Project 2010	Documentation, presentation slide, schedule planning and graphical diagram design
7-Zip	File compress and decompress
Foxit Reader 5.1	Reading pdf files
Mozilla Firefox	Browse and test system
Window 7 Professional 32bit Operating System	Operating system used in development
Avira Free Antivirus	Protect from virus and spyware

3.2.4 User Design Phase

The user design is the fourth phase of the project development. During the user design phase, users or the targeted audience of the system will interact with the developer in order to build the models and prototype that would represent the finalize product in terms of processes, outputs and inputs. The existing webpage will be enhanced by a brand new design according to the Nielsen's Heuristic Rules. For example, its content will be rearranged and interesting photos will be inserted in the webpage. Besides that for the sake of viewers' convenience, the webpage will be attached to other webpage that contain the required information. Just a click on the designed application and everything will be shown in front of the viewers. In order to make it a success, a story board is planned to enhance system.

Figure 3.2.4.1 shows the user interface flow diagram of Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage. First of all, the title of the Kinta Tourist Guide is searched online. Then click in the button of the right title and it will lead to the viewer's main page. There will be 'Facilities' hyperlink, 'Advertisement' hyperlink, 'Facilities' button and 'Administration' hyperlink within the main page. Each of the hyperlinks will lead the viewers to different page and each of the buttons has its own function.

When the 'Facilities' hyperlink is clicked, it will lead the viewers into the facilities main page which state about the facilities which are provided in the area of Ipoh, Kinta. There will be a summary of simple introduction about the facilities in the page. Then, there is a 'Choice' hyperlink within the page. The viewers can click the 'Choice' hyperlink and the viewers will be led into the page that has 'About Ipoh, 'Food to Eat', 'Accommodation', Tour Packages', and 'Home Page' hyperlinks. For example, if the viewers want to get into the page with more information about food, then the viewers can choose the 'Food to Eat' hyperlink and the viewers will be led into the food introduction page which has ample details and photos about the interesting local food in Ipoh, Kinta area.

Then, if the viewers click the ‘Advertisement’ hyperlink, the viewers can view a list of logos of a few companies in the Ipoh, Kinta area being advertised within the page. If the viewers have interest to view the information of the advertised company, the viewers can click the ‘Logo’ button within the page and lead to the advertisement information page.

Then if the administrator clicks the ‘Administration’ hyperlink, the administrator will be led to a page, ‘Administrator Login’ page which contains the administration menu. Then when the administrator clicks ‘Login’ hyperlink, the administrator will get into a page that comprises of ‘Administrator Registration’, ‘Database System’ and ‘Logout’ hyperlinks. In this page, the administrator can login the page and update the information of the webpage.

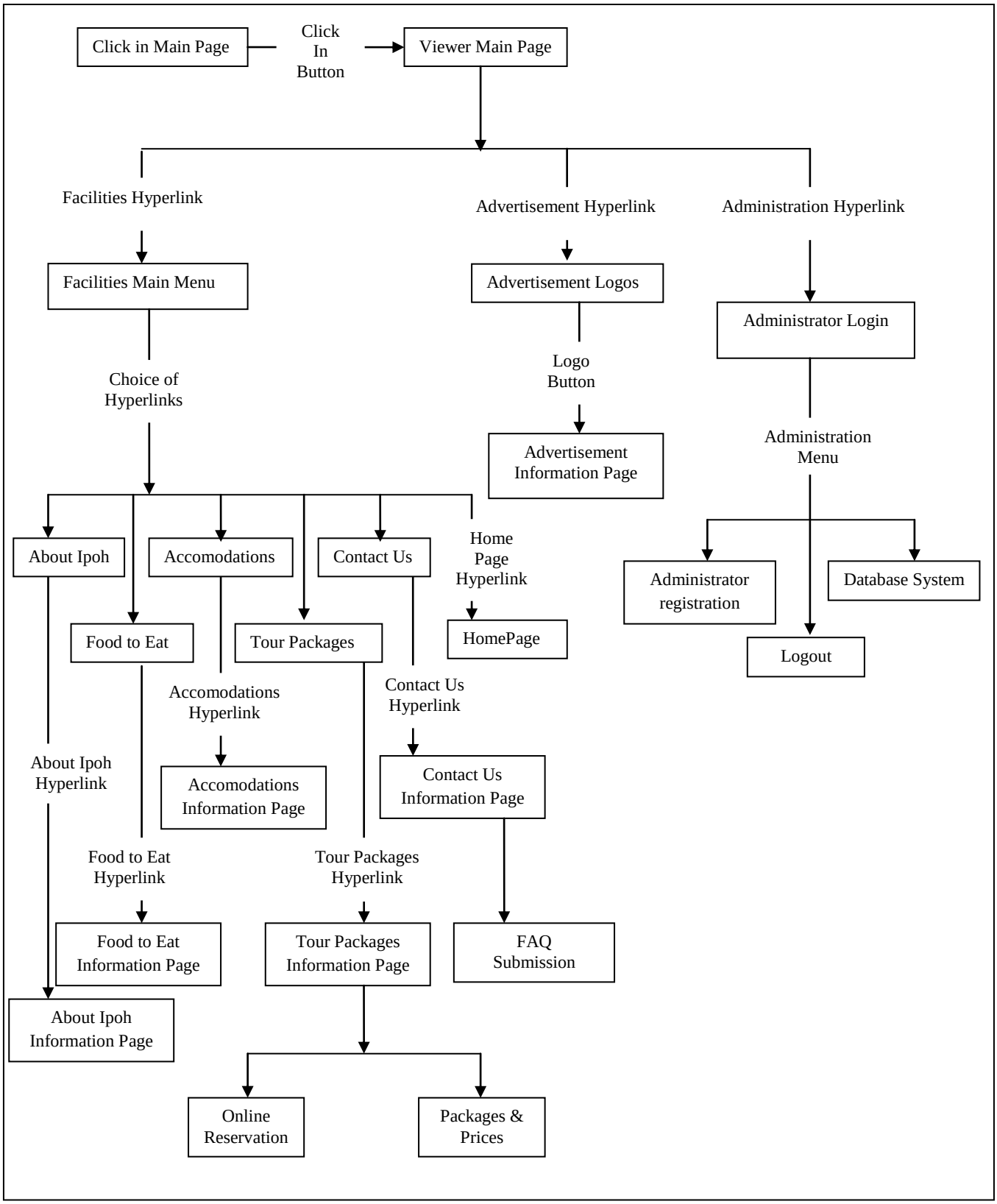


Figure 3.2.4.1: User Interface Flow Diagram of Enhancement of the Tour Guide Webpage based on HCI Elements for Kinta Tour Guide Webpage

3.2.5 Testing Phase

Testing Phase is the final phase of the project development. Testing Phase includes data conversion, testing, changeover to new system and user testing. Unit testing, integration testing, and system testing are carried out to test the system. The prototype of enhanced Kinta Tour Guide webpage will be tested for its usability. The testing will be done by using second survey with the same group of Internet users chosen in the first survey. The result output from the questionnaire regarding the prototype will be used for its further enhancement.

3.3 Research on Current Situation

The chosen existing webpage of Kinta Tour Guide webpage does not reach the standard as a tourism guide webpage. Kinta Tour Guide webpage fails to presents the contents and information well. Therefore, the existing webpage will be enhanced by using the Jacob Nielsen's Heuristic Rules. The parts of the existing webpage that contain weaknesses are being identified. Besides, a survey is done by showing the existing system of the Kinta Tour Guide page to the 30 chosen respondents, 15 UMP students who consist of non-IT background, 5 UMP FSKKP lecturers, 5 students who are from IT background, and 5 randomly chosen students. Meanwhile, every respondent will be given a questionnaire in order to evaluate the existing system and enable the respondents to leave the comments within the questionnaire. The questionnaire comprises of 10 questions which are asked according to the Heuristic Rules. The comments and evaluation from the 30 respondents are seriously considered to be applied in the webpage enhancement, base on the Heuristic Rules.

CHAPTER 4

IMPLEMENTATION & TESTING

4.1 Implementation

4.1.1 Visibility of System Status

The design of banner is clear and attractive as shown in Figure 4.1.1.1. A user will know what the website is all about during their first sight of the banner. Ipoh is also called the 'Bougainvillea City', after its rustic atmosphere and garden-like surroundings, or 'San Cheng', a Cantonese term referring to its magnificent limestone hills.

Figure 4.1.1.1: Banner of Kinta Tour Guide Website

Figure 4.1.1.1 shows the banner of Kinta Tour Guide Website. The Neo-Classic Ipoh Railway Station in Ipoh Old Town is a heritage landmark. Thus the Neo-Classic Ipoh Railway Station is important to be applied in the banner of Kinta Tour Guide Website as a representative of Ipoh's heritage building. On the other hand, the words 'Ipoh' is using yellow colour while 'Perak' is using black colour and

lastly ‘Welcome to Ipoh, The Bougainvillea City’ is using white colour. The 3 types of colours used as the representative of Perak state flag as shown in Figure 4.1.1.2. The flag of the state of Perak, in Malaysia, is a tri-coloured flag, made of three equal horizontal bands coloured white (top), yellow, and black (bottom). The flag of the state of Perak has a ratio of 1:2. The stripes on the flag symbolize the three branches of the Perak royal family. The white stripe represents the Sultan, yellow represents the Raja Muda (the crown prince) and black represents the Raja Di Hilir, which is the next in line after the crown prince. The background colour of blue colour is used to represent the colour of the sky.

Figure 4.1.1.2: Perak Flag

Figure 4.1.1.3 shows the coding implementation for Kinta Tour Guide Webpage’s banner. The banner’s position and size have been set to fit the Kinta Tour Guide webpage.

```
<body>
    <form id="form1" runat="server">
<center>
<table style="width:100%;">
    <tr>
        <td class="style12">
            <img alt="" class="style3" src="Images/visitIpoh.jpg" /></td>
        <td>
            <a id="A1" href="~/Account/Login.aspx" runat="server" style="float:right; margin-right:90px">ADMIN LOGIN</a>
            <img alt="" class="style4" src="Images/IpohBanner.png" /></td>
    </tr>
```

Figure 4.1.1.3: Coding Implementation for Kinta Tour Guide Webpage’s Banner

Besides that, the similar logo, banner, admin login's hyperlink, main menu, and footer will be applied in every page of the website. This is in order to show that all of the particular pages are still under the website of 'Kinta Tour Guide'. The logo applied is the existing system 'Visit Perak' logo as the common Perak tourism logo. The 'Visit Perak' logo has been recognised by all tourists and travellers. With the usage of the logo, users can simply know the website status of what the website is all about. The footer contains a few organizations' logos for advertisement purposes. This is in order to promote the companies or organizations who are interested and agree to involve in the webpage. Priority will be given to the companies which are involved in the local tourism sector such as Air Asia, Cuti-cuti Malaysia and so on. Hence, the related organizations are able to carry out promotion in the page. In additional to that, some common information contents are added beneath the advertisements logo which relates to the website. Figure 4.1.1.4 shows the logo, banner, main menu, and admin login's hyperlink of the 'Kinta Tour Guide Website' and Figure 4.1.1.5 shows the footer together with the organization's logo advertisements of the 'Kinta Tour Guide Website' respectively.

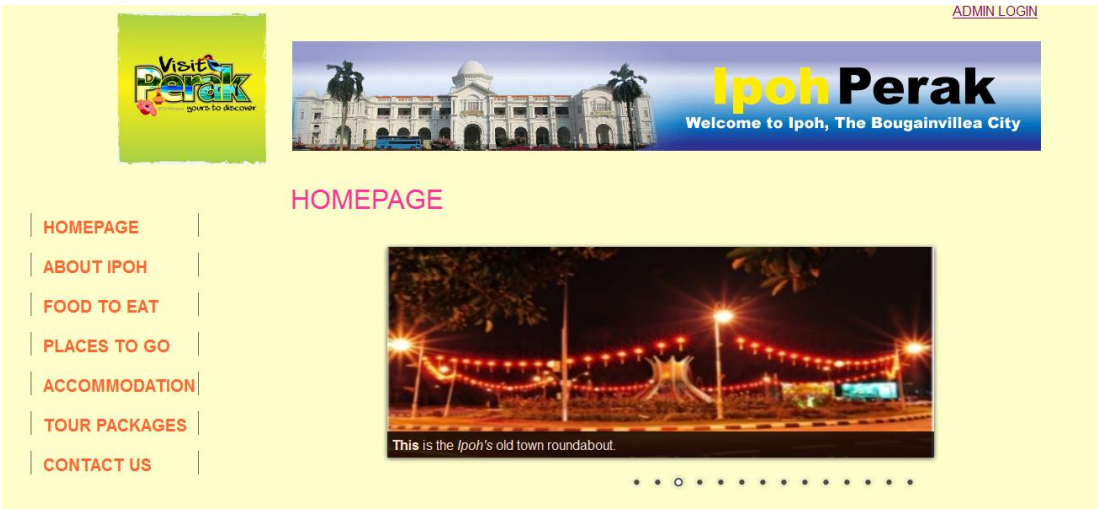


Figure 4.1.1.4: Logo and Banner of Kinta Tour Guide Website

Figure 4.1.1.5: Footer of Kinta Tour Guide Website

Figure 4.1.1.6 shows the coding implementation for logo, banner, main menu of Kinta Tour Guide Webpage where the same logo, banner, main menu will be applied in every webpages.

```
<body>
    <form id="form1" runat="server">
<center>
<table style="width:100%;">
    <tr>
        <td class="style12">
            <img alt="" class="style3" src="Images/visitIpoh.jpg" /></td>
        <td>
            <a id="A1" href="~/Account/Login.aspx" runat="server" style="float:right; margin-right:90px">ADMIN LOGIN</a>
            <img alt="" class="style4" src="Images/IpohBanner.png" /></td>
    </tr>
    <tr>
    <td style="vertical-align:top" class="style12">
    <br />
    <br />
    <div class="listmenu">
                        <ul>
                <li><a id="A8" runat="server" href="">HOMEPAGE</a></li><br />
                <li><a id="A2" runat="server" href="~/Default.aspx">ABOUT IPOH</a></li><br />
                <li><a id="A3" runat="server" href="~/FoodToEat1.aspx">FOOD TO EAT</a></li><br />
                <li><a id="A4" runat="server" href="~/PlacesToGo.aspx">PLACES TO GO</a></li><br />
                <li><a id="A5" runat="server" href="~/PlacesToStay.aspx">ACCOMMODATION</a></li><br />
                <li><a id="A6" runat="server" href="~/TourPackages.aspx">TOUR PACKAGES</a></li><br />
                            <li><a id="A7" runat="server" href="~/ContactUs.aspx">CONTACT US</a></li>
                        </ul>
        </div>
    </td>
    <td><br />
    <div style="color:#FF3399; padding-left:25px; font-size:24pt;" align="left">HOMEPAGE</div><br /><br />
```

Figure 4.1.1.6: Coding Implementation for Logo, Banner and Main Menu of Kinta Tour Guide Webpage

Figure 4.1.1.7 shows the coding implementation for footer of Kinta Tour Guide Webpage where the footer will be applied in every webpages.

```
    Special Links
    <hr style="1" />
    <p>
        <table style="width:100%;">
            <tr>
                <td align="right">
                <a href="http://www.airasia.com/my/ms/home.page">
                    <img alt=""src="Images/asia.jpg" class="style5" /></a></td>
                <td align="center" class="style9">
                <a href="http://www.virtualtourist.com/travel/Asia/Malaysia/Negeri_Pulau_Pinang/Penang-1282036/TravelGuide-Penang.html">
                    <img alt="" src="Images/penangLogo.jpg" class="style6" /></a></td>
                <td align="left" class="style10">
                <a href="http://www.redang.com.my/">
                    <img alt="" src="Images/redang.jpg" class="style6"/></a></td>
                <td align="left">
                <a href="http://www.tourism.gov.my/">
                    <img alt=""  src="Images/malaysia.jpg" class="style7" /></a></td>
            </tr>
        </table>
    </p>
    <hr style="1" />
    <p style="text-align: center">
         </p>
    <p style="text-align: center">
        <span>Copyright © 2003-2012 Templatemonster.com. All Rights
        Reserved. Payments are carried out by Colerno Trade Limited. . </span>
        <br />
        <a href="http://www.templatemonster.com/privacy-policy.php">
        <span>Privacy Policy</span></a><span> | </span>
        <a href="http://www.templatemonster.com/report-spam.php" rel="nofollow">
        <span>Report spam</span></a><br />
        <span>Template Monster - Website Templates | Flash Templates |
        Web Templates Design </span>
    </p>
    <p style="text-align: center">
         </p>
    <script src="nivo-slider/demo/scripts/jquery-1.7.1.min.js" type="text/javascript"></script>
        <script src="nivo-slider/jquery.nivo.slider.pack.js" type="text/javascript"></script>
        <script type="text/javascript">
            $(window).load(function () {
                $('#slider').nivoSlider();
            });
    </script>
    </body>
</html>
```

Figure 4.1.1.7: Coding Implementation for Footer of Kinta Tour Guide Webpage

Besides that, a header as certain topic will always show at the top of the webpages' contents and beneath the website banner. The topics' header is same with the left hand side main topics' menu to ensure that the users to be informed at which webpage the users are and to avoid users from being confused. Figure 4.1.1.8 shows the webpage's header as 'About Ipoh' when users click at the 'About Ipoh' at the

main topics' menu as highlighted with circle in Figure 4.1.1.8. Another example is shown in Figure 4.1.1.9 where the webpage header written as 'Food To Eat' when users click to 'Food To Eat' at main topics' menu as highlighted with circle in Figure 4.1.1.9.

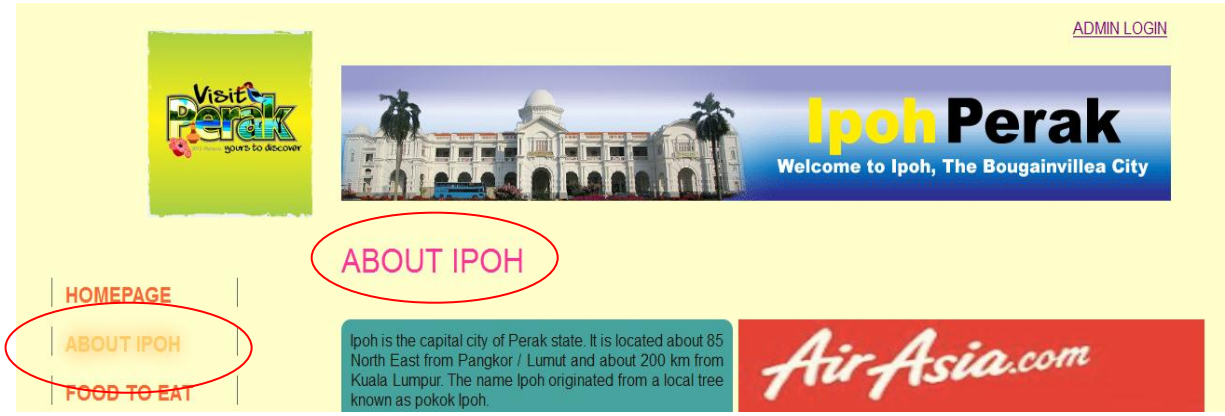


Figure 4.1.1.8: Header of Webpage

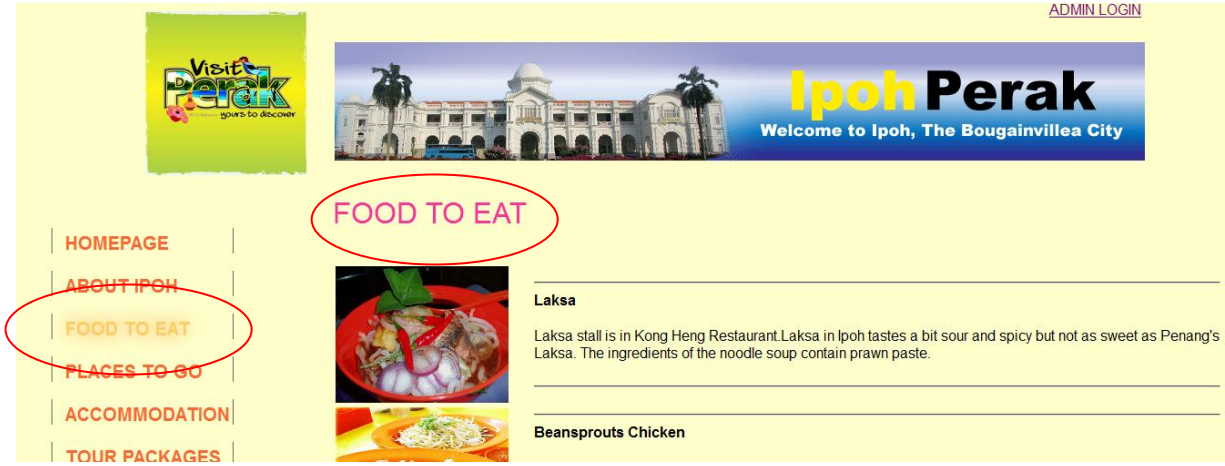


Figure 4.1.1.9: Header of Webpage

Figure 4.1.1.10 shows the coding implementation for a header as certain topic will always shown at the top of the webpages' contents and beneath the website banner. The topics' header is exactly the same with the left hand side main topics' menu selection.

```
.listmenu li{
                position: relative;
                width: 200px;
                margin: 0;
                padding: 0;
                list-style: none;
                font-size: 20px;
            }
        .listmenu li a:hover {

                color:#FFCC66;
                text-shadow: #FF9933 0 0 20px;
            }
            .listmenu li a {
                color:#FF6633;
                display: block;
                border-left:1px solid #666;
                border-right:1px solid #666;
                height:20px;
                padding: 4px 0 4px 14px;
                text-decoration: none;
                font-weight:bold;
            }
            .listmenu ul{
                position: fixed;
            }

<td style="vertical-align:top" class="style12">
    <br />
    <br />
    <div class="listmenu">
                        <ul>
                <li><a id="A8" runat="server" href="">HOMEPAGE</a></li><br />
                <li><a id="A2" runat="server" href="~/Default.aspx">ABOUT IPOH</a></li><br />
                <li><a id="A3" runat="server" href="~/FoodToEat1.aspx">FOOD TO EAT</a></li><br />
                <li><a id="A4" runat="server" href="~/PlacesToGo.aspx">PLACES TO GO</a></li><br />
                <li><a id="A5" runat="server" href="~/PlacesToStay.aspx">ACCOMMODATION</a></li><br />
                <li><a id="A6" runat="server" href="~/TourPackages.aspx">TOUR PACKAGES</a></li><br />
                                <li><a id="A7" runat="server" href="~/ContactUs.aspx">CONTACT US</a></li>
                        </ul>
        </div>
    </td>
```

Figure 4.1.1.10: Coding implementation of a Header's Topic and the Main Menu's Topic

4.1.2 Match Between System and The Real World

The language and words used in the webpage is designed to be as simple as possible for deeper and easier to be understood by a wide range of users as shown at Figure 4.1.2.1. Then, Figure 4.1.2.2 shows the main menu's information within the webpage is designed to appear in a logical and natural order. For example as the webpage is a tour webpage, automatically information about interesting destinations, accommodations and famous local food are introduced.

Figure 4.1.2.1: Contents of 'About Ipoh' Webpage

Figure 4.1.2.2: Menu's of Website Information

Figure 4.1.2.3 shows the coding implementation for the main menu of the Kinta Tour Guide Webpage.

```
<div class="listmenu">
                    <ul>
            <li><a id="A8" runat="server" href="">HOMEPAGE</a></li><br />
            <li><a id="A2" runat="server" href="~/Default.aspx">ABOUT IPOH</a></li><br />
            <li><a id="A3" runat="server" href="~/FoodToEat1.aspx">FOOD TO EAT</a></li><br />
            <li><a id="A4" runat="server" href="~/PlacesToGo.aspx">PLACES TO GO</a></li><br />
            <li><a id="A5" runat="server" href="~/PlacesToStay.aspx">ACCOMMODATION</a></li><br />
            <li><a id="A6" runat="server" href="~/TourPackages.aspx">TOUR PACKAGES</a></li><br />
                        <li><a id="A7" runat="server" href="~/ContactUs.aspx">CONTACT US</a></li>
                    </ul>
      </div>
```

Figure 4.1.2.3: Coding Implementation of Main Menu

Figure 4.1.2.4 shows the coding implementation for ‘About Ipoh’ webpage’s contents. The language and phrases used as contents of the webpage are as simple as possible to be easier understood by various kind of users.

```
<div id="content" style="color:black; padding-left:25px; font-size:16px" align="left">
    Ipoh is the capital city of Perak state.
    It is located about 85 North East from Pangkor / Lumut and about 200 km from Kuala Lumpur.
    The name Ipoh originated from a local tree known as pokok Ipoh.<br />
    Ipoh is also a place where mystical scenes exist when u look through enough.
    Ipoh is located in the rich tin bearing valley of the river. It grew up as a mining town.
    The Ipoh city has a long and turbulent history going back a long time.<br /><br />
    During the British colonial era, Ipoh was Malaysia's second city for administration purposes.
    The "Old Town" is located to the west of the Kinta River while "New Town" is located to the east of the Kinta River.
    </div>
```

Figure 4.1.2.4: Coding Implementation of Webpage’s Contents

4.1.3 User Control and Freedom

Main Menu within the webpage is designed on the left side of the webpage and each of the main topics in the menu is attached to specific informative page which is under particular topic. The Main Menu is a fixed position that is written in the coding part for certain specification and this function is mobilized. In other words, the Main Menu part can move up and down within the page, following the scrolling direction. Figure 4.1.3.1 shows the main menu on its original position before users scroll the webpage. While Figure 4.1.3.2 shows the main menu at bottom position when users scroll the webpage until the end of the webpage. This function is made convenience for the users as the users do not have to scroll upwards to the main menu position in order to view the other subtopics. Thus, the design that allows users to click at other subtopics when users are at the bottom of the webpage without scrolling upwards, is user friendly and convenient when the main menu is designed to be moving with the scrolling direction. Users do not have to scroll all the way back upwards to find for the menu after the users have scrolled down the webpage. The main menu will be always in the viewer’s sight. In other words, disregarding which part the user is scrolling at, the main menu is always on the left side of the webpage, readily to be clicked by the users.

Figure 4.1.3.1: Original Position of Main Menu

Figure 4.1.3.2: Bottom Position of Main Menu

Figure 4.1.3.3 shows the coding implementation of the Main Menu part where the main menu can move up and down within the page, following the scrolling direction. The purpose of the designed main menu function usage is more convenience for users as the main menu is designed to be mobilized and moving along with the users' scrolling direction.

```
.listmenu ul{
            position: fixed;
        }

<div class="listmenu">
                <ul>
            <li><a id="A8" runat="server" href="~/HomePage.aspx">HOMEPAGE</a></li><br />
            <li><a id="A2" runat="server" href="">ABOUT IPOH</a></li><br />
            <li><a id="A3" runat="server" href="~/FoodToEat1.aspx">FOOD TO EAT</a></li><br />
            <li><a id="A4" runat="server" href="~/PlacesToGo.aspx">PLACES TO GO</a></li><br />
            <li><a id="A5" runat="server" href="~/PlacesToStay.aspx">ACCOMMODATION</a></li><br />
            <li><a id="A6" runat="server" href="~/TourPackages.aspx">TOUR PACKAGES</a></li><br />
                    <li><a id="A7" runat="server" href="~/ContactUs.aspx">CONTACT US</a></li>
                </ul>
    </div>
```

Figure 4.1.3.3: Coding Implementation of Main Menu of the Webpage

Besides that, the photos displayed within the webpage are designed in thumbnail pattern with 'Previous', 'Next' and ‘Close’ functions as shown in Figure 4.1.3.4, Figure 4.1.3.5 which shows the ‘Next’ function and Figure 4.1.3.6 which shows the ‘Previous’ function which have been circled respectively. Hence, a user can enjoy the photos freely, one by one because the photos are not controlled by a fixed timeline like the slideshow as shown in Figure 4.1.3.4 with thumbnail photos pattern, Figure 4.1.3.5 and also Figure 4.1.3.6 with ‘Next’ and ‘Previous’ function of photo viewer slideshow.

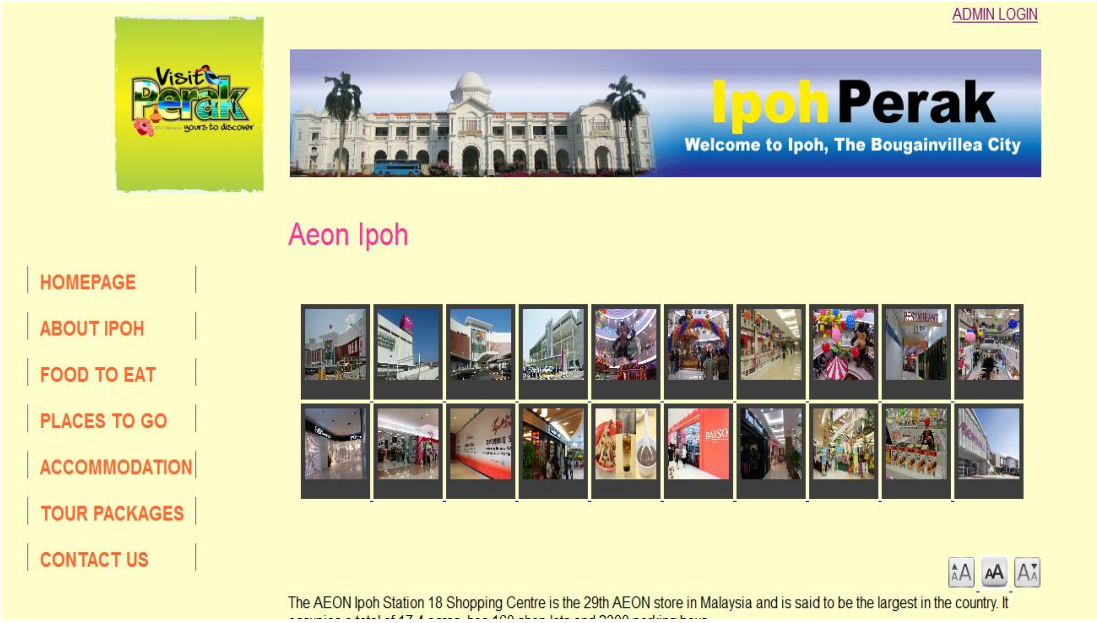


Figure 4.1.3.4: Thumbnail Photos Viewer

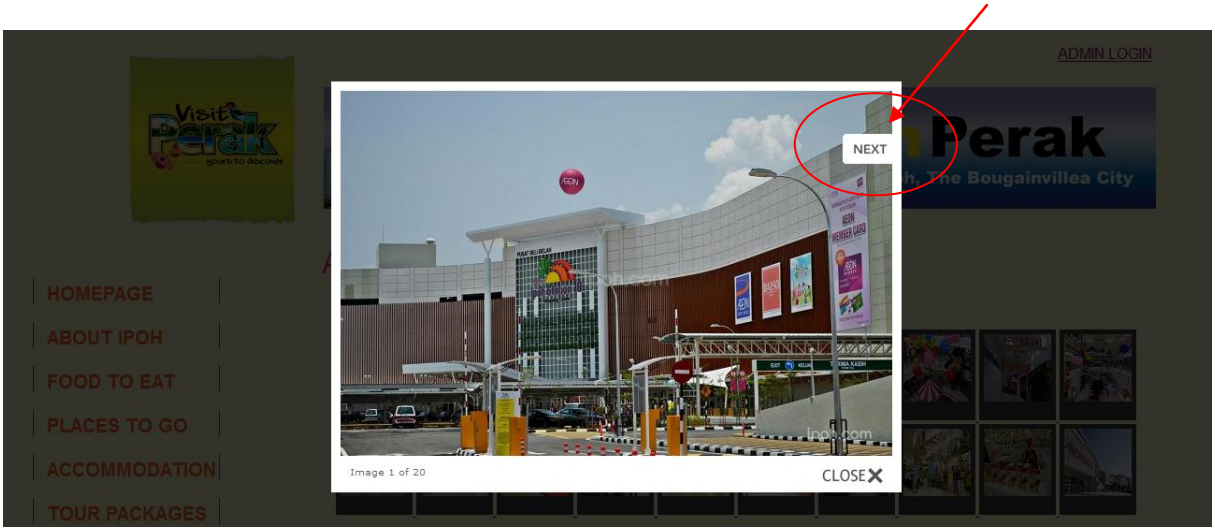


Figure 4.1.3.5: Photo Viewer with 'Next' Buttons Function

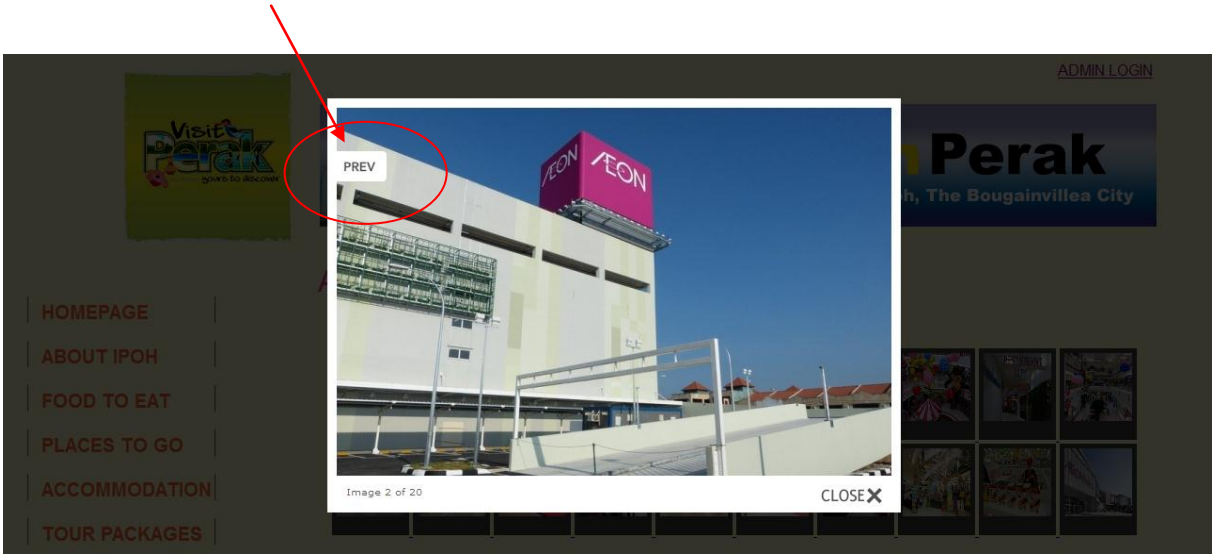


Figure 4.1.3.6: Photo Viewer with 'Previous' Buttons Function

In additional to that, a function within the page that allows a user to adjust the font of the words in the contents is provided. Figure 4.1.3.7 shows the original font size of contents. While Figure 4.1.3.8 shows the increased of font size of contents when users click to the 'Increase Font' icon which has been circled to increase the font size and Figure 4.1.3.9 shows the decreased of font size of contents when users click to the 'Decrease Font' icon which has been circled to decrease the font size of contents.

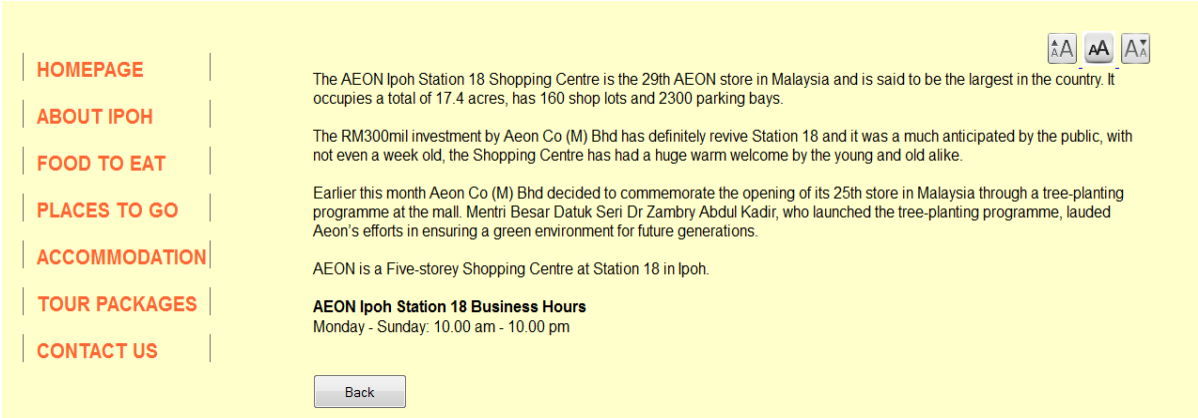


Figure 4.1.3.7: Original Font Size of Contents

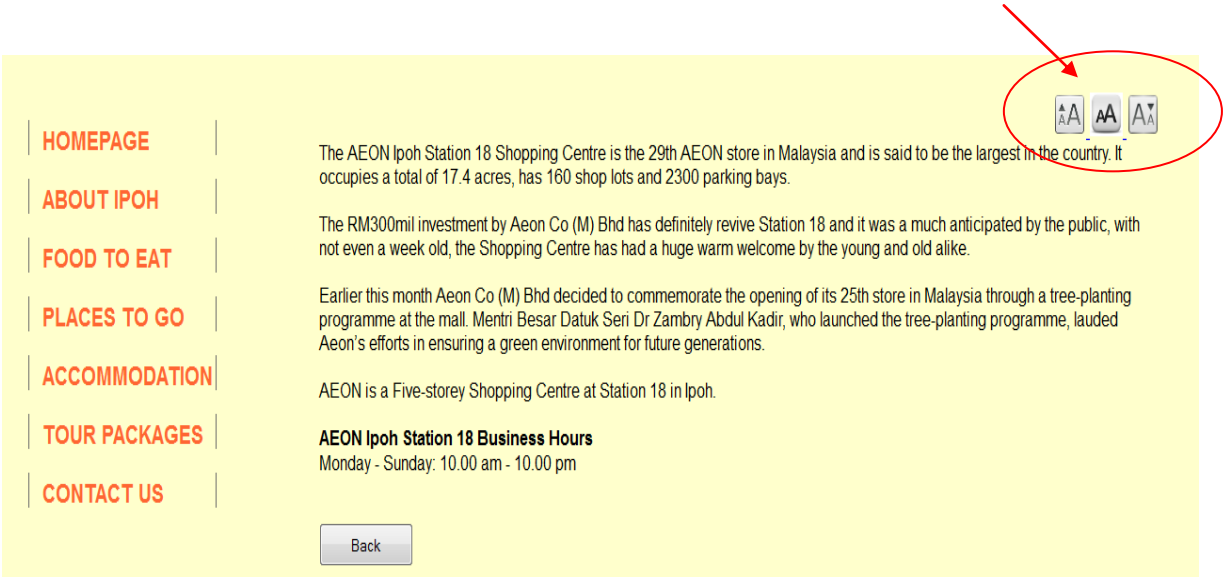


Figure 4.1.3.8: Increased Font Size of Contents

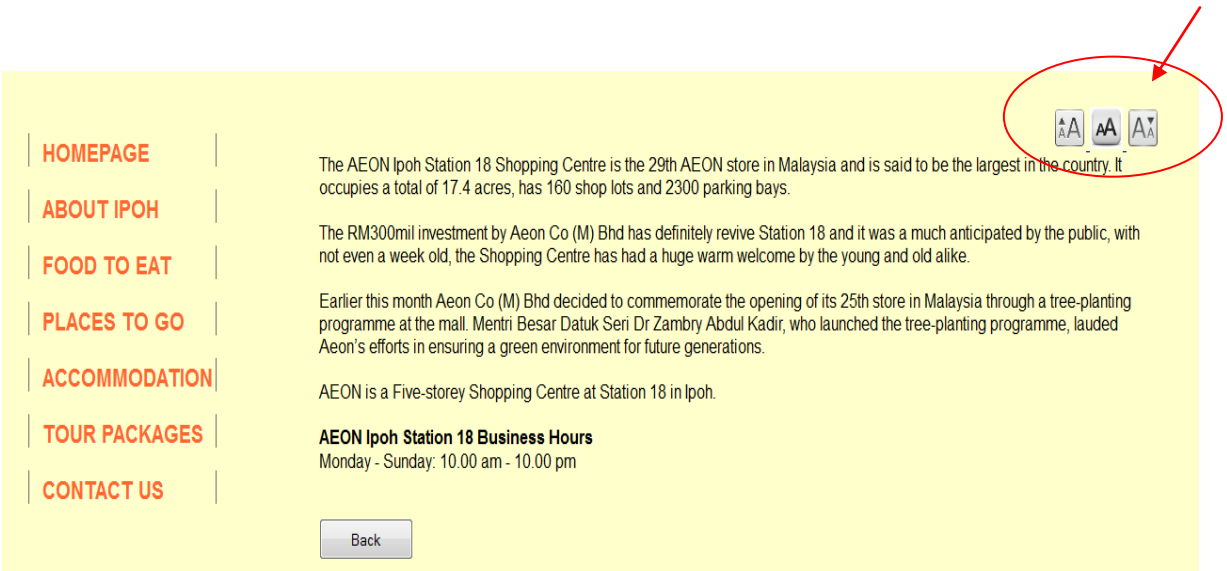


Figure 4.1.3.9: Decrease Font Size of Contents

Figure 4.1.3.10 shows the font size adjustments coding. The coding shown is using JavaScript's function to increase and decrease the font size of contents where a 'click' can be represented by the icon which is being circled in Figure 4.1.3.7 and Figure 4.1.3.8.

```
<%@ Page Language="vb" AutoEventWireup="false" CodeBehind="LingSenTong.aspx.vb" Inherits="IpohTourism.LingSenTong" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html>
<head>
<script type="text/javascript"></script>
    <script type="text/javascript">
    function changeFontSize(element, step) {
        step = parseInt(step, 10);
        var el = document.getElementById(element);
        var curFont = parseInt(el.style.fontSize, 10);
        el.style.fontSize = (curFont + step) + 'px';
    }
</script>
</head>
</body>
<div align="right">
    <a href="javascript:void(0);" onclick="changeFontSize('content','2');">
    <img src="Images/increase.jpg" alt="Plus" title="Increase Font" style="cursor:pointer" width="30" height="30" />
    </a>   
    <a href="javascript:void(0);" onclick="changeFontSize('content',-2);">
    <img src="Images/decrease.jpg" alt="Minus" title="Decrease Font" style="cursor:pointer" width="30" height="30" />
    </a>
    <div id="content" style="color:black; padding-left:25px; font-size:16px" align="left">
    Ling Sen Tong cave temple is located next door to Nam Thean Tong and Sam Poh Tong just off Jalan Gopeng on the southern outskirts of Ipoh.
    Ling Sen Tong probably picks up a lot of tourist visitors who are heading to those more famous cave temples.<br /><br />
    This temple is quite different from its neighbours. The garden in front is decorated with colourful statues of characters from Chinese
    mythology such as the Monkey King from the classic tale Journey to the West. The almost cartoon-like caricatures of dragons, the Goddess
    Kuan Yin and other figures give the temple a children's theme park atmosphere. The cave itself is very shallow and is more like an
    overhang of the hill Gunung Rapat which looms above the temple.<br /><br />
    Although the courtyard outside may resemble a children's garden, the cave temple itself appears to attract serious devotees judging by
    the roof of the cave which has been stained black by the smoke of countless joss-sticks. There is also a newish looking building with
    Tibetan style features, Dudjom New Treasure Buddhist Society.<br /><br />
    </div><br /><br /></div>
    <div style="padding-left:25px; font-size:16px" align="left"">
        <asp:Button ID="Button1" runat="server" Text="Back" Height="35px"
            PostBackUrl="~/Temples.aspx" Width="100px" />
    </div>
</body>
</html>
```

Figure 4.1.3.10: Font Size Adjustment Codes Function

4.1.4 Error Prevention & Help Users Recognize, Diagnose, and Recover From Errors (Combined)

Moreover, a 'Reset' button is applied in the 'Contact Us' page in order to enable a user to redo the user's personal information in case it is done wrongly or contain careless mistake before being submitted as shown in Figure 4.1.4.1 and Figure 4.1.4.2 which have been pointed with an arrow. The design is done as an error prevention step. If the user fill in the information in the page wrongly, the user just have to press 'Reset' button and the user can fill in the page again.

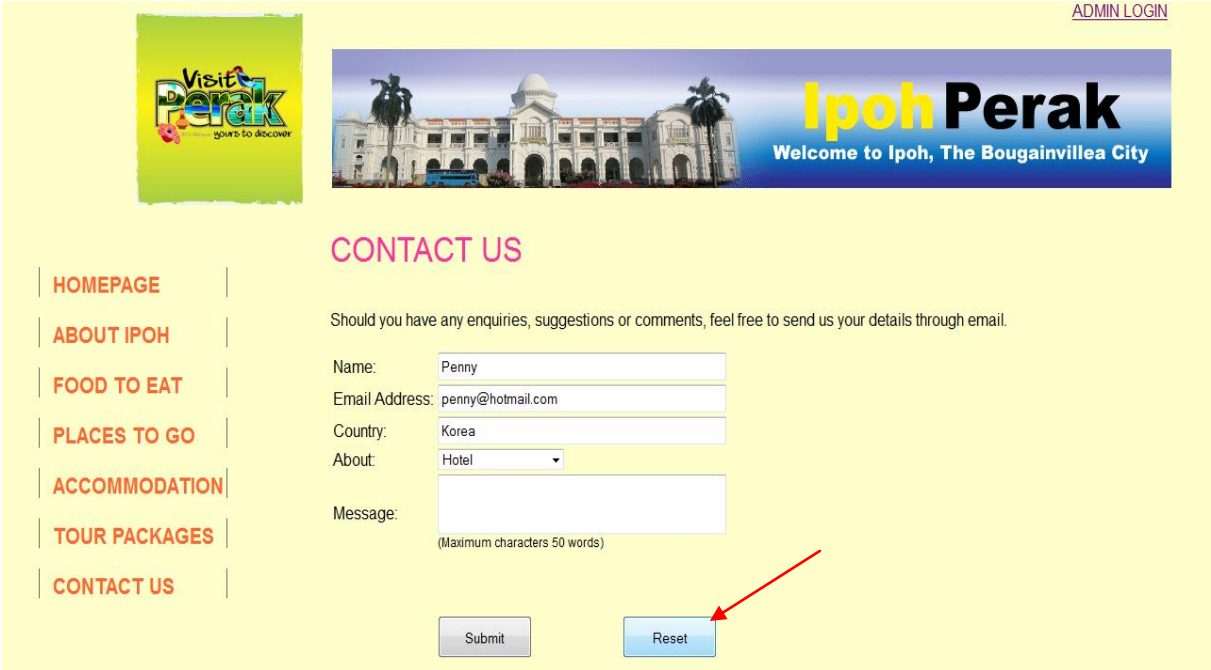


Figure 4.1.4.1: Users' Input Information

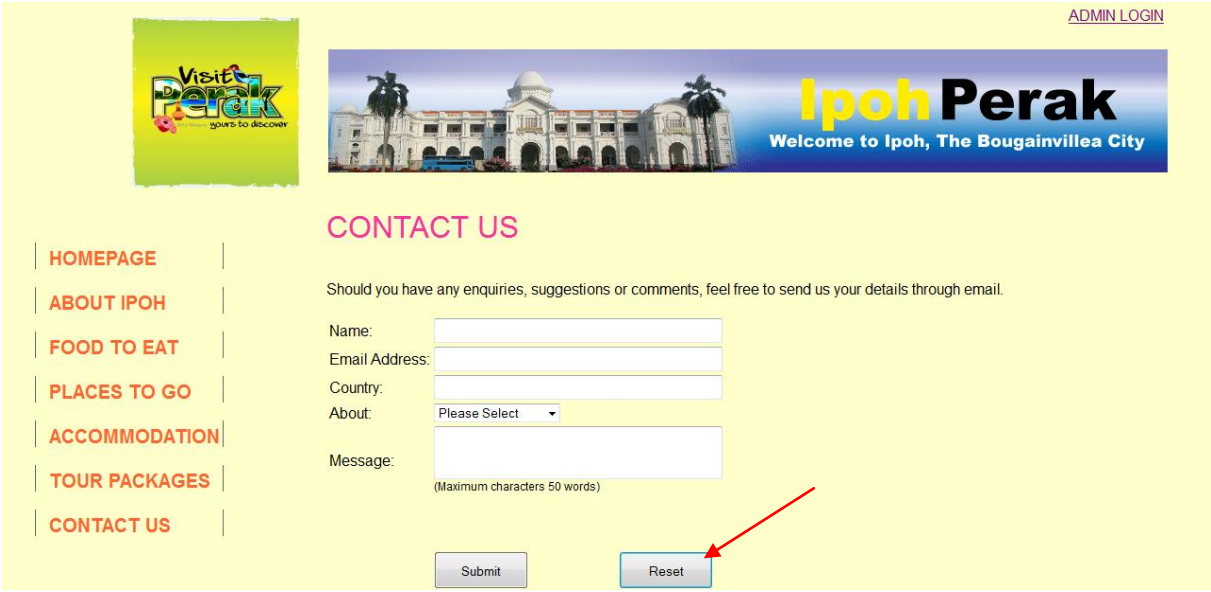


Figure 4.1.4.2: Reset Button Function

Figure 4.1.4.3 shows the coding implementation for 'Reset' button function in order to enable users to correct any wrong input of information.

```
<asp:Button ID="Button1" runat="server" Height="40px" Text="Submit" Width="100px" />
      <a ID="Preview" runat="server" class="style15" href="#dialog" name="modal"
 style="font-size:large" visible="false">Preview</a>             
<a ID="Back" runat="server" class="style15" href="#"
 onclick="history.go(-1);return false;" visible="false">Back</a>     
<input id="Reset" type="reset" value="Reset" runat="server" class="style13"/>
```

Figure 4.1.4.3: Coding Implementation of 'Reset' Button Function

The webpage is designed with error message. For example, Figure 4.1.4.4 shows if the user fills in the users' information form wrongly, the form cannot be submitted and an error message will pop out to help the user to fill up the form correctly in order to recover from errors. The design of error message is an error prevention step which is significant to fulfil the Human Computer Interaction Jacob Nielsen's Heuristic Rules.

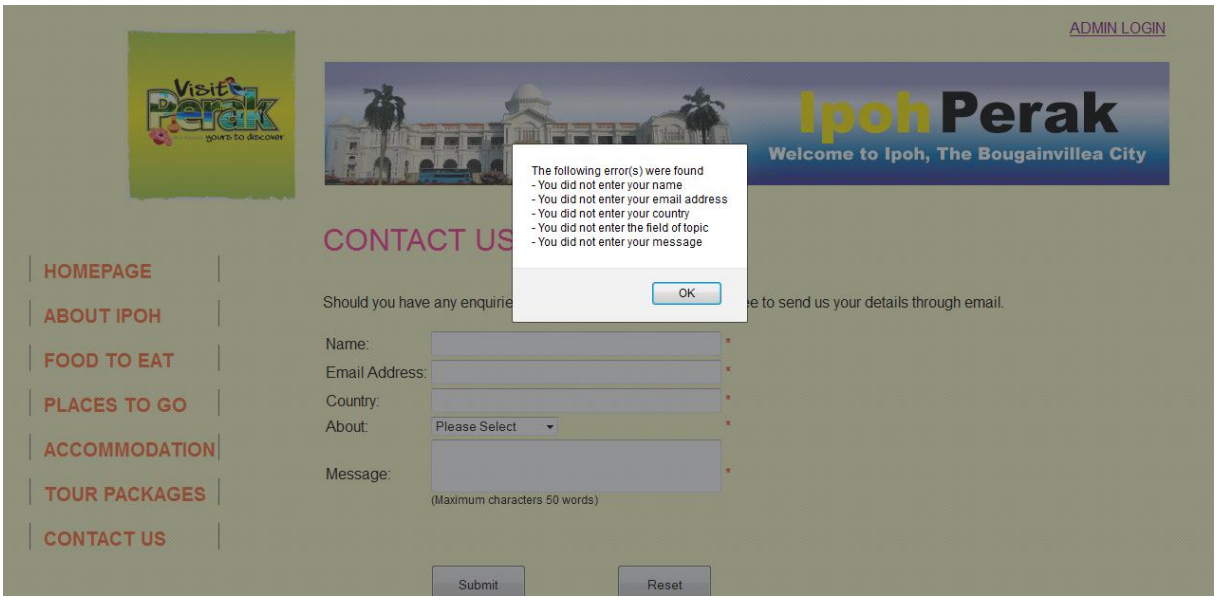


Figure 4.1.4.4: Pop Out Error Message

Figure 4.1.4.5 shows the coding implementation for pop out error message box to inform users that errors occur and users are required to enter the correct information. Error message box is a good error prevention function.

```
<tr>
    <td>
        <asp:ValidationSummary ID="ValidationSummary1" runat="server" ForeColor="Red"
         HeaderText="The following error(s) were found" ShowMessageBox="True"
         ShowSummary="False" />
    </td>
</tr>
```

Figure 4.1.4.5: Coding Implementation of Pop Out Message Box

4.1.5 Recognition Rather Than Recall

Photos are used to represent most of the words in the designed webpage. This will avoid the user from being bored. People will prefer to view interesting and colourful pictures or photos than reading bunch of plain and boring words and this is the nature of human being. Moreover, the user also will have a better understanding through the photos too. This is due to fact that a simple photo can represent a thousand words to the users and an interesting photo of a tourism destination is a significant tool to be used to attract the travellers or tourists. Moreover, a photo can be an important decisive tool for the user, either visiting the particular place or not. In other words, the users' final decision may depend to how much the users are being attracted to the particular tourism destination which is shown in the photo. Recognization of photos is more convenience than to recall words. For example, Figure 4.1.5.1 shows the hotel's images and allows users to have an idea on how the hotels' appearance without wasting time to imagine how the hotels are looked like.

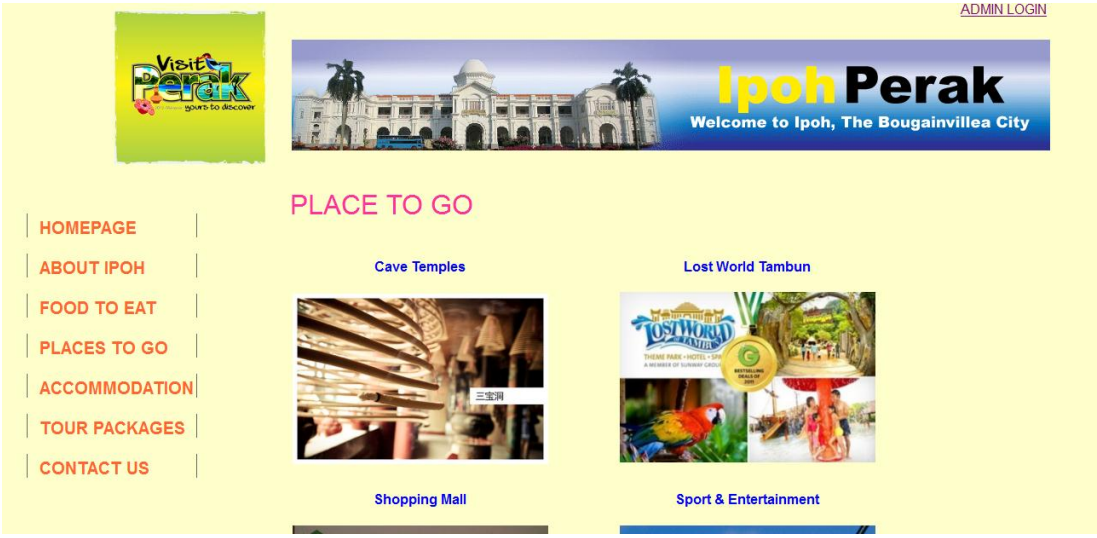


Figure 4.1.5.1: Hotel's Photo Image

Figure 4.1.5.2 shows the coding implementation of photos displayed to represent most of the words in the designed webpage. With the specific photos displayed under certain topic, users can easily understand the meaning of the information provided.

```
<tr>
    <td><p style="color:Silver; font-weight: 700;" align="center">Cave Temples</p>

    </td>
    <td>
                         
    </td>
    <td>
        <p style="color:Silver; font-weight: 700;" align="center">Lost World Tambun</p>
    </td>
    </tr>
    <tr>
    <td>
        <a href="Temples.aspx">
         <img alt="" src="Images/SamPohTong2.jpg" class="style11" /></a>
    </td>
     <td>
                         
    </td>
    <td>
        <a href="LostWorldTambun.aspx">
        <img alt="" src="Images/10.jpg" class="style11" />

    </td>
    </tr>
    <tr></tr><tr></tr><tr></tr><tr></tr><tr></tr><tr></tr>
    <tr>
    <td>
        <p style="color:Silver; font-weight: 700;" align="center">Shopping Mall</p>
    </td>
    <td>
                         
    </td>
    <td>
        <p style="color:Silver; font-weight: 700;" align="center">Sport & Entertainment</p>
    </td>
    </tr>
```

Figure 4.1.5.2: Coding Implementation of Photos Displayed

4.1.6 Aesthetic and Minimalist Design

The contents in the designed webpage has been simplified or summarized in order to reduce the number of words in the page and avoid irrelevant information. The contents are explained with simple words and languages which are understood by users in a short paragraph that is designed to be not more than 1 webpage and the contents are represented by photo images of the specific topics as shown in Figure 4.1.6.1. In the designed page, the usage of bombastic, scientific and mathematical words or terms are avoided to be made suitable for a wide range of Internet users.

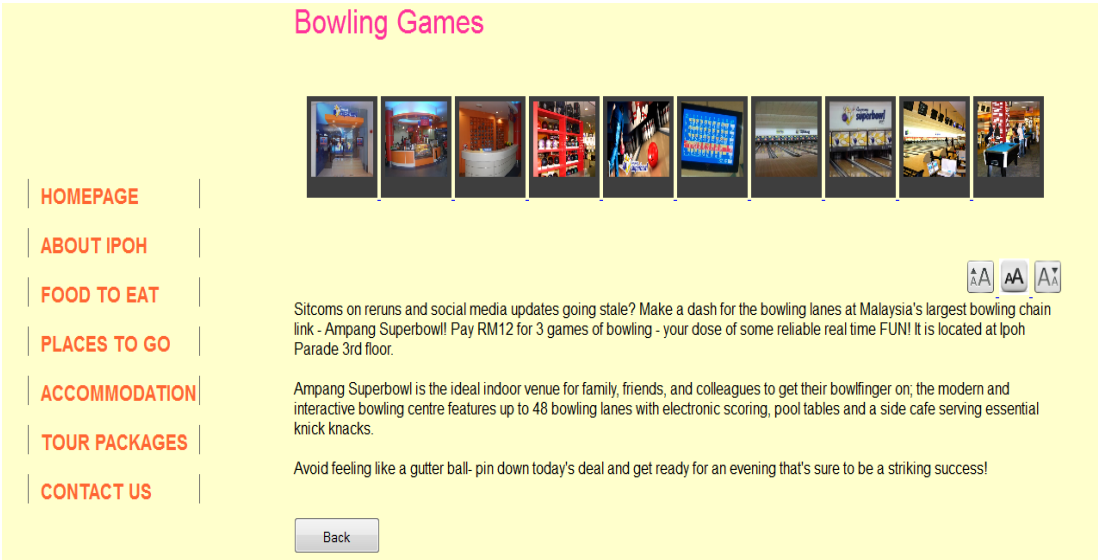


Figure 4.1.6.1: Photo of Images as Contents' Representative

Then, an extra feature is implemented for the administration purposes in order to provide a space for administrator to edit or updating the user information of the tour packages reservation within the same review page without disturbing or changing the codes of the coding system. There is a hyperlink navigation of 'Admin Login' located at the top right hand side above each of the webpages' banner as shown is Figure 4.1.6.2 which has been circled. When administrator wishes to edit website's information or contents, the administrator just need to click on the 'Admin Login' hyperlink, administrator will be led to the 'Admin Login Page' for login as shown in Figure 4.1.6.2.

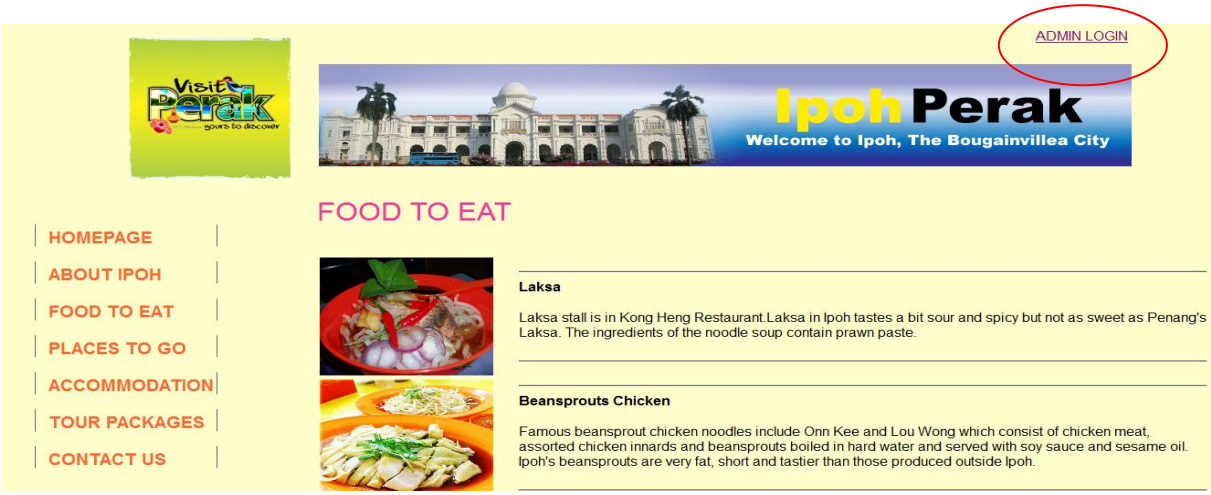


Figure 4.6.2: Admin Login Hyperlink

Figure 4.1.6.3 shows the coding implementation of 'Admin Login' hyperlink navigation where only administrator can login to the administrator webpage where administrator's username and password are required as shown as Figure 4.1.6.4.

```
<tr>
        <td class="style12">
            <img alt="" class="style3" src="Images/visitIpoh.jpg" />
        <td>
            <a id="A1" href="~/Account/Login.aspx" runat="server" style="float:right; margin-right:90px">ADMIN LOGIN</a>
            <img alt="" class="style4" src="Images/IpohBanner.png" />
    </tr>
```

Figure 4.1.6.3: Coding Implementation of 'Admin Login' Hyperlink Navigation

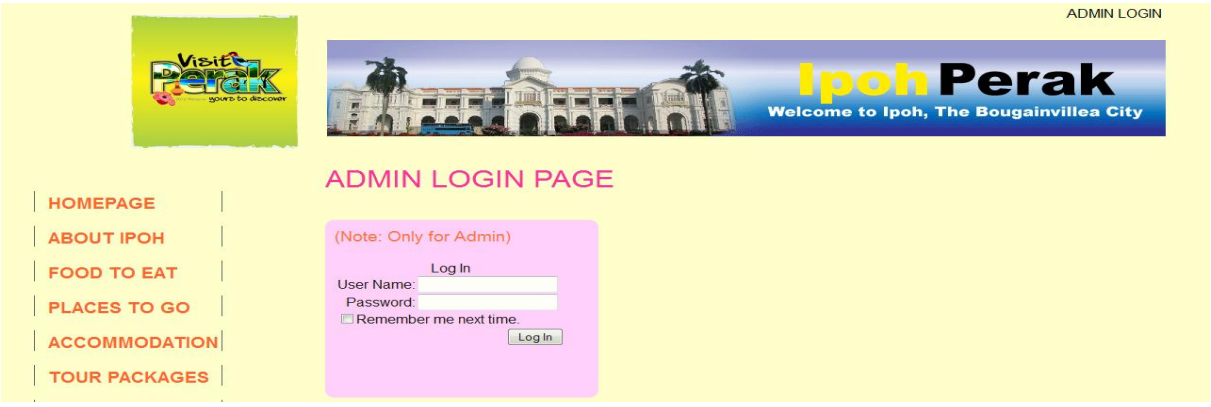


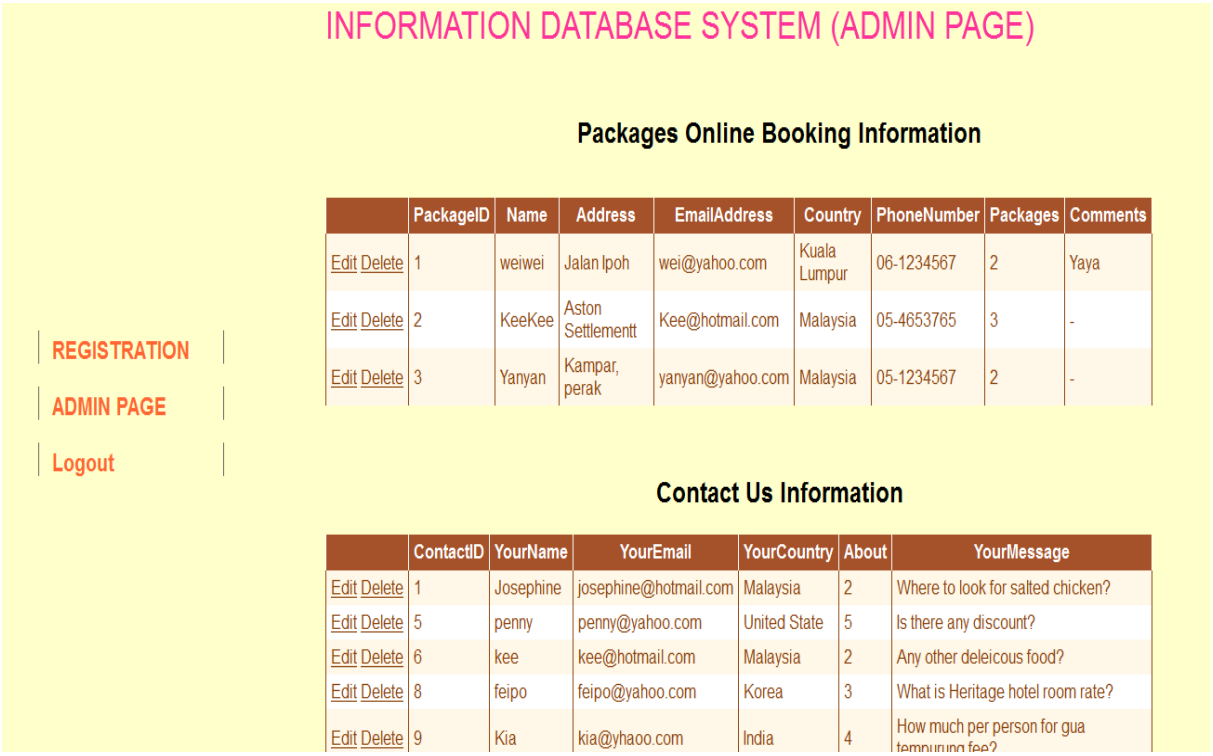
Figure 4.1.6.4: Admin Login Page

Figure 4.1.6.5 shows the coding implementation for ‘Admin Login’ webpage where administrators’ username and password are required in order to login to the administrator webpage.

```
<div style="color:#FF3399; padding-left:25px; font-size:24pt;" align="left">ADMIN LOGIN PAGE<br /><br /></div>
    <div style="padding-left:25px">
    <div class="curved" style="background-color:#FFCCFF">
    <span style="color:#FF6633; font-size:14pt">(Note: Only for Admin)</span>
        <br />
        <br />
        </center>
        <asp:Login ID="Login2" runat="server"
        DestinationPageUrl="~/Admin.aspx"
        ForeColor="Black" Font-Size="Medium">
        <ValidatorTextStyle Font-Names="*" />
        </asp:Login>
   </div></div>
```

Figure 4.1.6.5: Coding Implementation for ‘Admin Login’ Webpage

The administrator can login into the ‘Administrator Page’ to update the information of the users’ ‘Packages Online Booking Information’ and ‘Contact Us Information’ as shown in Figure 4.1.6.6.



	PackageID	Name	Address	EmailAddress	Country	PhoneNumber	Packages	Comments
Edit Delete	1	weiwei	Jalan Ipoh	wei@yahoo.com	Kuala Lumpur	06-1234567	2	Yaya
Edit Delete	2	KeeKee	Aston Settlementt	Kee@hotmail.com	Malaysia	05-4653765	3	-
Edit Delete	3	Yanyan	Kampar, perak	yanyan@yahoo.com	Malaysia	05-1234567	2	-

	ContactID	YourName	YourEmail	YourCountry	About	YourMessage
Edit Delete	1	Josephine	josephine@hotmail.com	Malaysia	2	Where to look for salted chicken?
Edit Delete	5	penny	penny@yahoo.com	United State	5	Is there any discount?
Edit Delete	6	kee	kee@hotmail.com	Malaysia	2	Any other deleicous food?
Edit Delete	8	feipo	feipo@yahoo.com	Korea	3	What is Heritage hotel room rate?
Edit Delete	9	Kia	kia@yhaoo.com	India	4	How much per person for gua tempurung fee?

Figure 4.1.6.6: Information Database System (Admin Page)

Figure 4.1.6.7 shows the 'Registration' webpage where administrators can create new account with new username and password for 'Admin Login' in future access. A 'Logout' hyperlink function is provided in the main menu where administrator can click to logout after editing, cancelling, and updating information in database system.

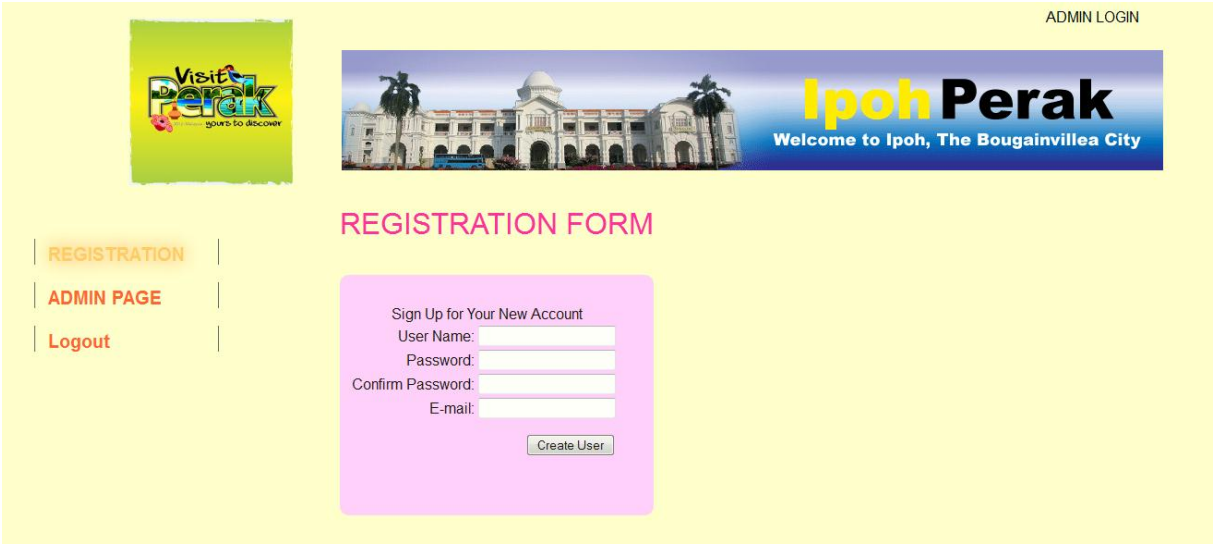


Figure 4.1.6.7: Registration Form

4.1.7 Consistency and Standards

The contents within every webpages are consistent and divided into several paragraphs. Then, every paragraph is standardized to contain 3-5 sentences only as shown in Figure 4.1.7.1 under 'Food To Eat' webpage and Figure 4.1.7.2 under 'Place To Stay' webpage. Besides that, font-size of words of contents applied is the same on every webpages as shown in Figure 4.1.7.3 under 'Place To Go' webpage. In additional to that, for every webpages, logo, banner, main menu, admin login hyperlink, and footer used are the same and consistent to maintain the system status for users. A webpage with consistent and standardized design is well arranged and the users will feel that the webpage is more reliable. No matter how good a delicacy is and how delicious the delicacy is being described in words, the food description needs at least a photo to support those words and make it reliable to the viewer. The

design can be viewed from most of the attractive and standardized webpage from the internet. In other words, the design can be considered as a standard for all interesting webpages.

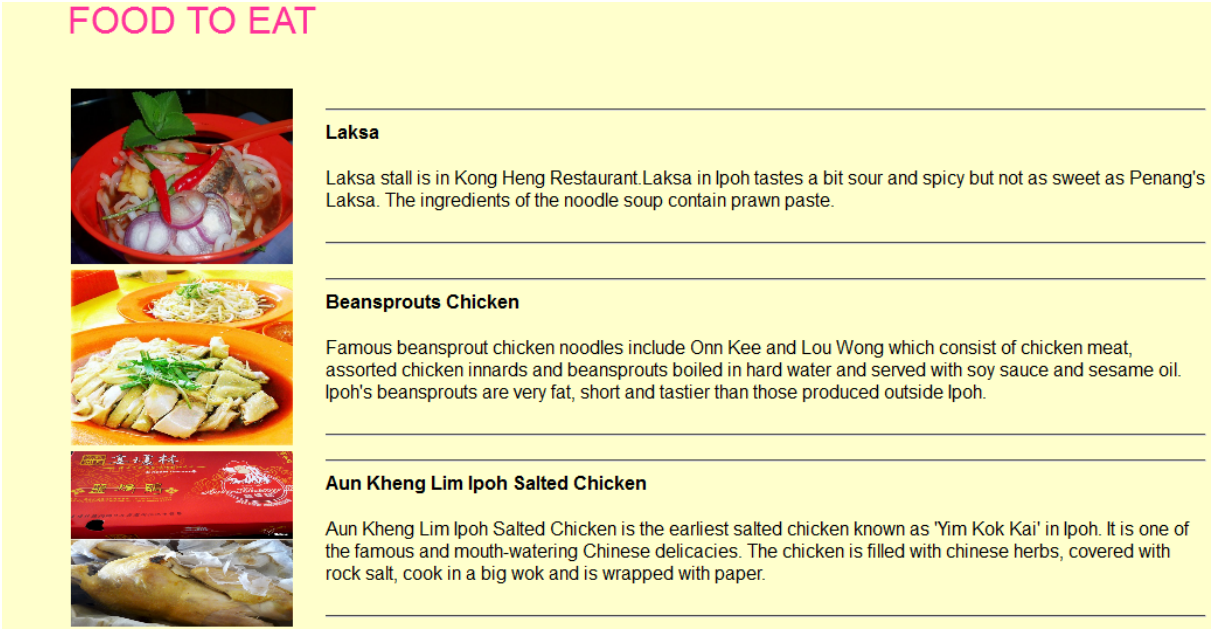


Figure 4.1.7.1: Food To Eat Webpage's Contents

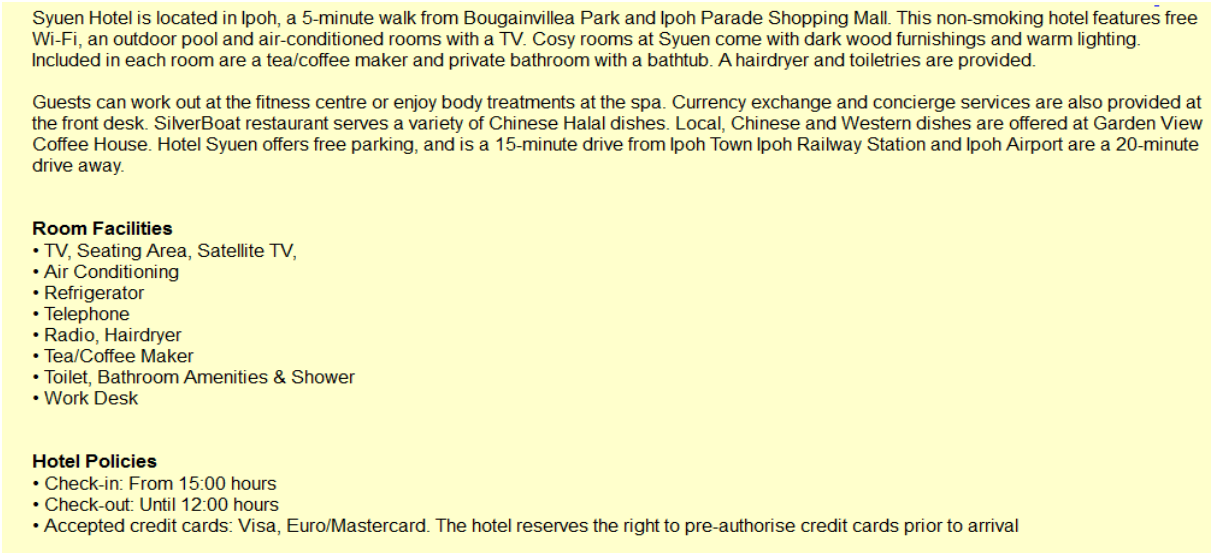
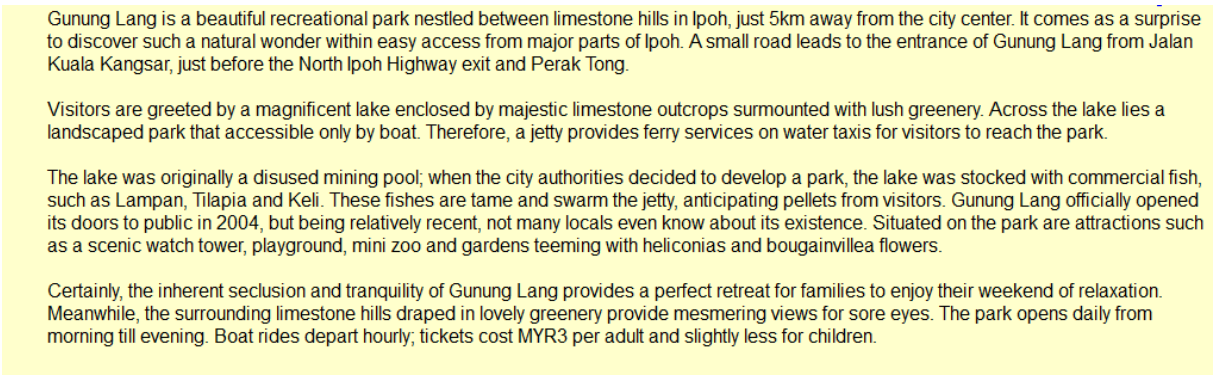


Figure 4.1.7.2: Place To Stay Webpage's Contents



Gunung Lang is a beautiful recreational park nestled between limestone hills in Ipoh, just 5km away from the city center. It comes as a surprise to discover such a natural wonder within easy access from major parts of Ipoh. A small road leads to the entrance of Gunung Lang from Jalan Kuala Kangsar, just before the North Ipoh Highway exit and Perak Tong.

Visitors are greeted by a magnificent lake enclosed by majestic limestone outcrops surmounted with lush greenery. Across the lake lies a landscaped park that accessible only by boat. Therefore, a jetty provides ferry services on water taxis for visitors to reach the park.

The lake was originally a disused mining pool; when the city authorities decided to develop a park, the lake was stocked with commercial fish, such as Lampan, Tilapia and Keli. These fishes are tame and swarm the jetty, anticipating pellets from visitors. Gunung Lang officially opened its doors to public in 2004, but being relatively recent, not many locals even know about its existence. Situated on the park are attractions such as a scenic watch tower, playground, mini zoo and gardens teeming with heliconias and bougainvillea flowers.

Certainly, the inherent seclusion and tranquility of Gunung Lang provides a perfect retreat for families to enjoy their weekend of relaxation. Meanwhile, the surrounding limestone hills draped in lovely greenery provide mesmering views for sore eyes. The park opens daily from morning till evening. Boat rides depart hourly; tickets cost MYR3 per adult and slightly less for children.

Figure 4.1.7.3: Place To Go Webpage's Font-Size Contents

Then, the contents of the page are designed to follow a standardized flow. For example, for each webpages beneath the website's logo and banner, the contents of the webpage will begin with a specific subtopic header to inform users what the selected webpage subtopic is about. Figure 4.1.7.4 with the circled header is an example of that and the users will reach this page when users click on the 'Contact Us' hyperlink at main menu.

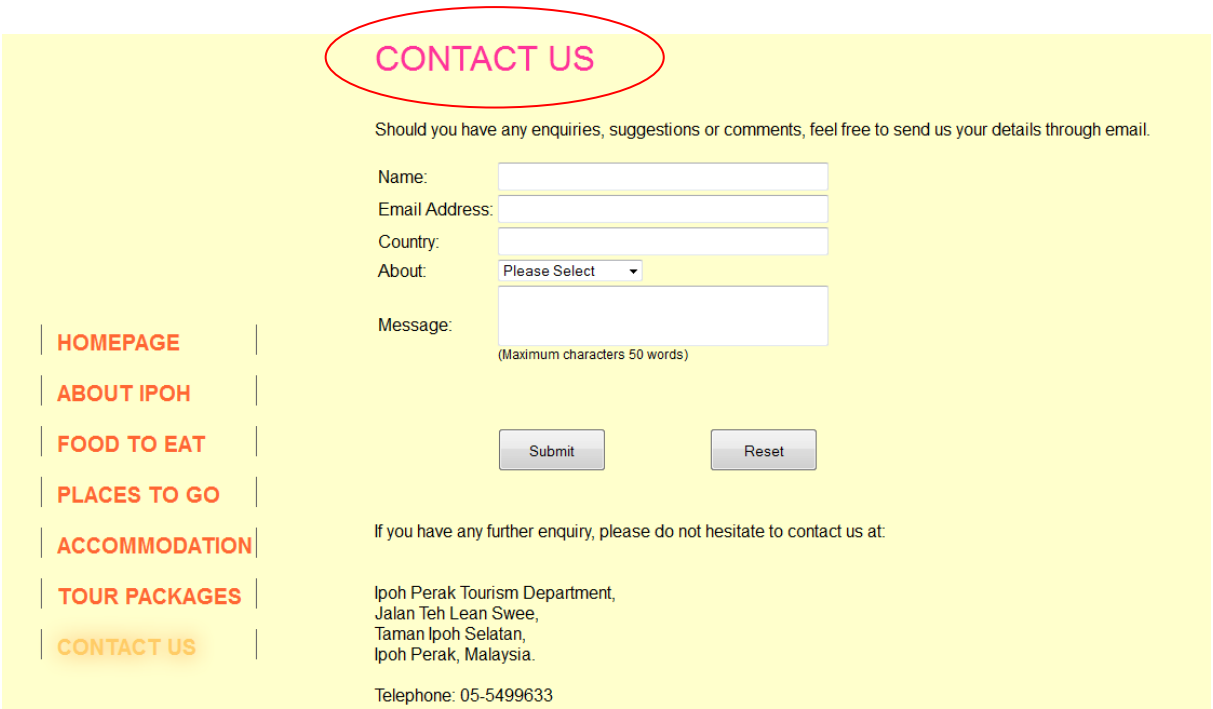


Figure 4.1.7.4: Contact Us Topic's Header

Other than that, the colour used for the background is faded yellow. Faded yellow colour won't be too bright or dull that will make the viewers feel uncomfortable. Then, faded yellow colour is soft and also easy to suit with other colours that will make the contents on the background clearer for the viewers. Figure 4.1.7.5 shows the original selected colour which is faded yellow. Besides that, 2 extra colours used in the 'About Ipoh' webpage which consist of blue greenish colour column for the upper part contents while grey colour column for lower part contents. Both columns contain a brief description about Ipoh. For instance, the contents mainly describe about the history of Ipoh, how does the name of Ipoh is given, location of Ipoh and so on. This is in order to avoid the webpage from being designed with plain layout which may lead to dull and boring effect. Moreover, the colours applied are matched with the background colour which will not be too bright or too dull. Colours are important to make the webpages interesting and attractive. In additional to that, slideshow images is used to make the webpage being more attractive and interesting. The slideshow is designed to show the photos of Ipoh.

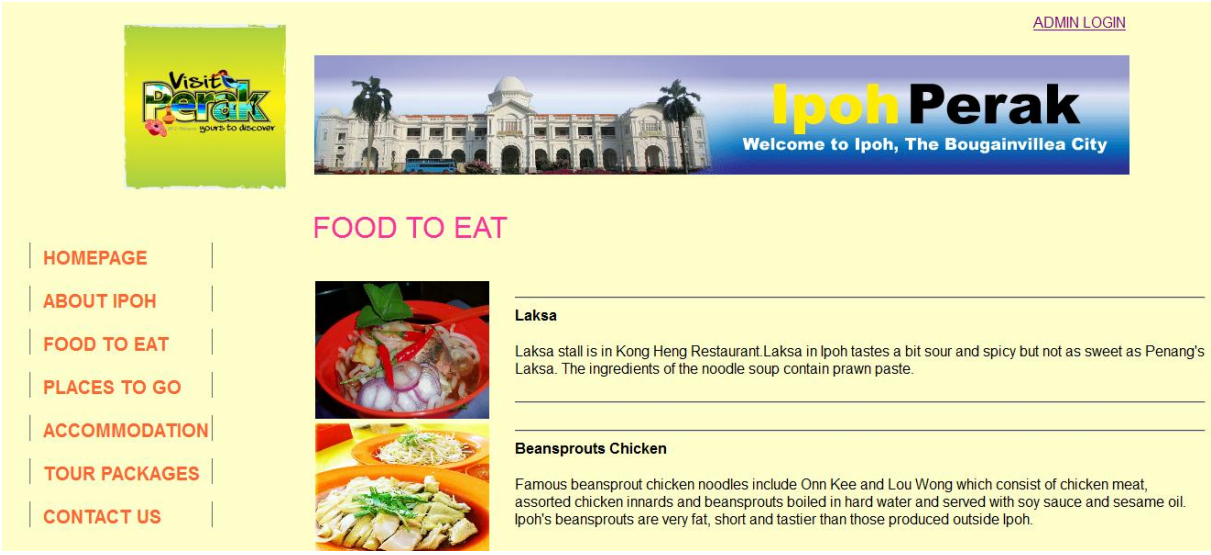


Figure 4.1.7.5: Original Selected Faded Yellow Colour

Figure 4.1.7.6 shows a light blue background colour, and Figure 4.1.7.7 shows a dull colour which is walnut colour which is applied into 'Kinta Tour Guide' webpage. Colours used for Figure 4.1.7.6 and Figure 4.1.7.7 are not encouraged as colours which are too bright and sharp will bring about eyes aching while dull colour will lead to boring atmosphere. Besides that, bright and dull colours are also hard to

be matched with other colours. In additional to that, red, green and yellow colours are not being applied in the design as those colours are inconvenience for colour-blind users. Hence, choosing the colours wisely for the design is very important.

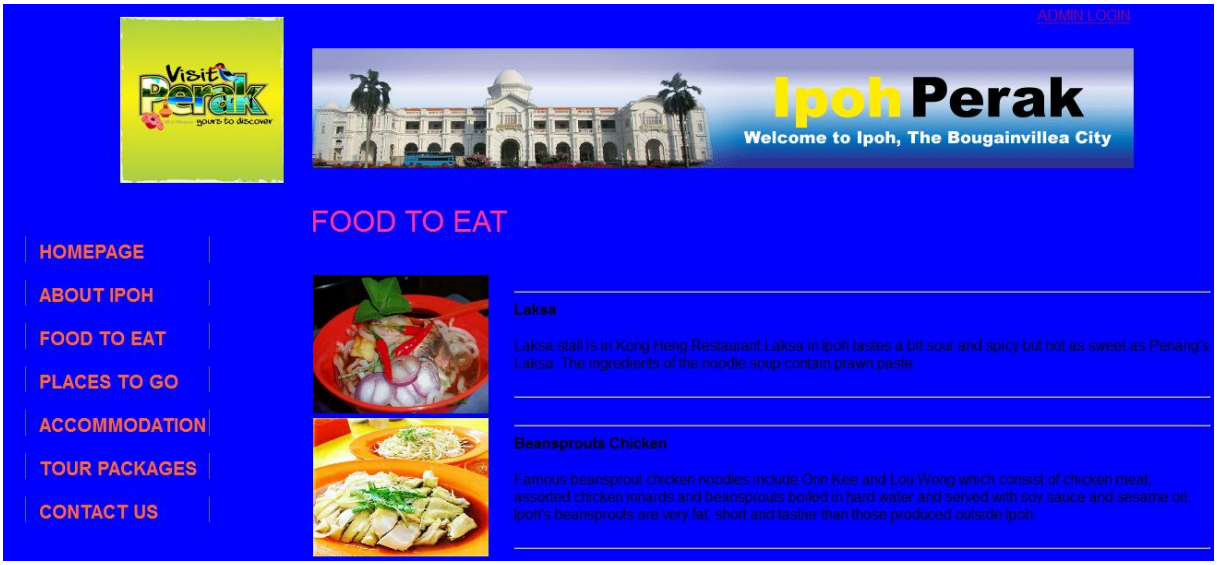


Figure 4.1.7.6: Light Blue Colour

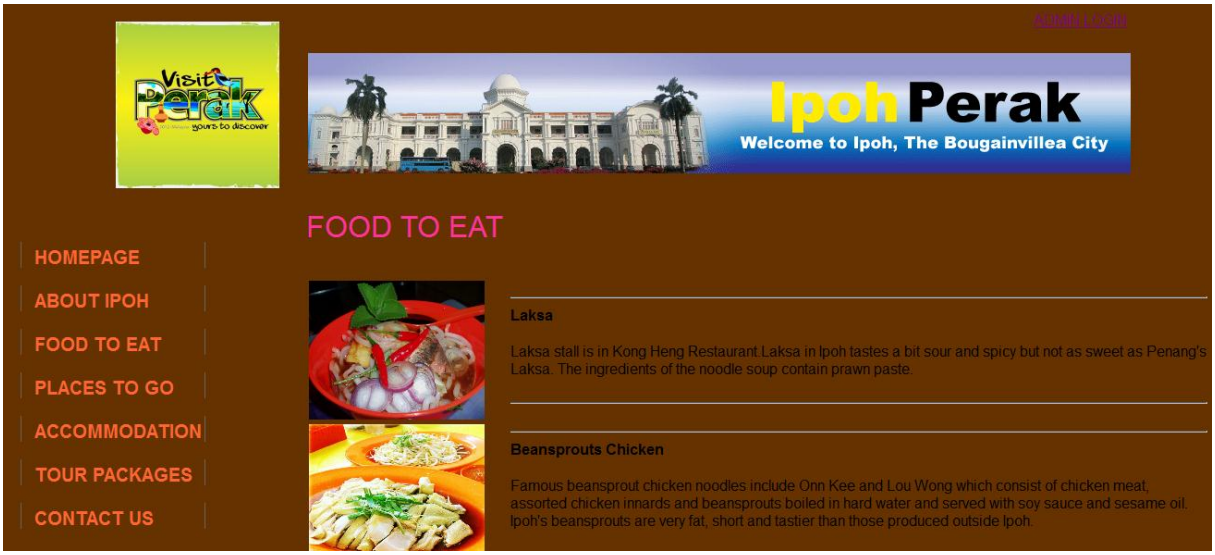


Figure 4.1.7.7: Walnut Colour

CONCLUSION

As a conclusion, the webpage of the Kinta Tour Guide has been successfully enhanced by the application of Jacob Nielsen's Heuristic Rules. The webpage has been enhanced by concerning about the human natures that fond to look for easier things, search for attractive things, be attracted by creative designs and a human nature that like freedom as well as eager to be the one that control things and not otherwise. Hence, the design of the enhanced webpage will be definitely favourable by the users.

4.2 Testing

The questionnaire survey is done regarding the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system for testing as shown in Appendix C. The respondents comprise of 15 UMP students who consist of non-IT background, 5 UMP FSKKP lecturers, 5 students who are from IT background, and 5 randomly chosen students. Majority of the respondents are giving positive comments regarding the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system. Those comments from the respondents are significant and are seriously considered to be applied for future webpage enhancement of the project. The contents of the Kinta Tour Guide webpage are represented by photos and most of the respondents mention that the webpage is easy to control with the provided hyperlink navigations. Then, there are comments about the creativity of the webpage. As a tourist guide page, the design of the page is quite attractive with the background design and colour used. In addition to that, as a tourist guide page, the Kinta Tour Guide webpage is attached with interesting photos regarding the tour destination introduced by the webpage.

CHAPTER 5

RESULT

5.1 Analysis of Data Collection based on Survey Questions

According to the questionnaire survey which has been done regarding the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system throughout 30 respondents which comprise of 15 UMP students who consist of non-IT background, 5 UMP FSKKP lecturers, 5 students who are from IT background, and 5 randomly chosen students, the data collected are shown in Table5.1.1 and Figure 5.1.1 before enhancement as well as Table 5.1.2 and Figure 5.1.2 after enhancement. Figure 5.1.1 and Figure 5.1.2 show the data analysis using graph bar. The survey questions can be referred as Appendix C.

Table 5.1.1: Data Collection Based On the Survey Questions of Existing Website

Questions No.	Number of Respondents				
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1	15	9	4	2	-
2	3	7	13	5	2
3	9	11	9	1	-
4	2	10	9	8	1
5	10	15	5	-	-
6	-	-	4	11	15
7	6	11	6	7	-
8	-	1	12	17	-
9	8	15	5	2	-
10	4	7	15	4	-

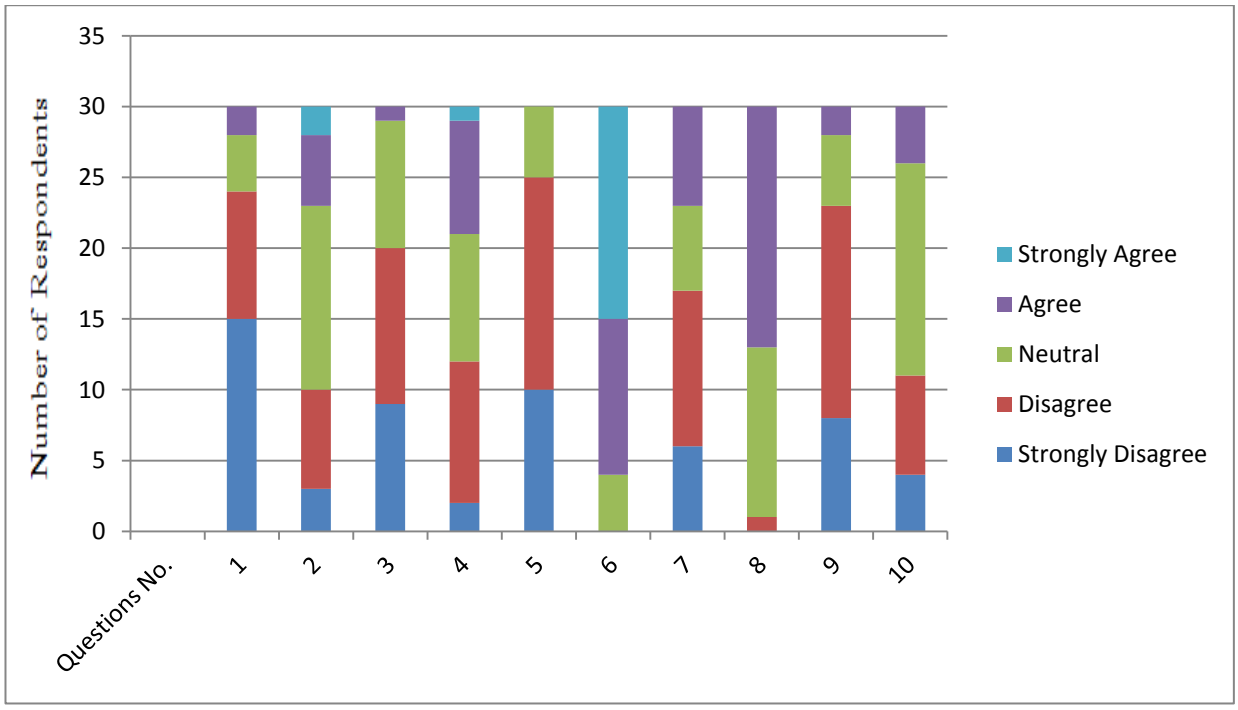


Figure 5.1.1: Graph Bar of the Existing Website before Enhancement

Table 5.1.2: Data Collection Based On the Survey Questions of Enhanced Kinta Tour Guide Webpage

Questions No.	Number of Respondents				
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1	-	-	-	10	20
2	-	-	-	7	23
3	-	-	-	15	15
4	-	-	-	6	24
5	-	-	-	11	19
6	14	12	4	-	-
7	-	-	-	9	21
8	-	-	-	13	17
9	-	-	-	10	20
10	-	-	-	10	20

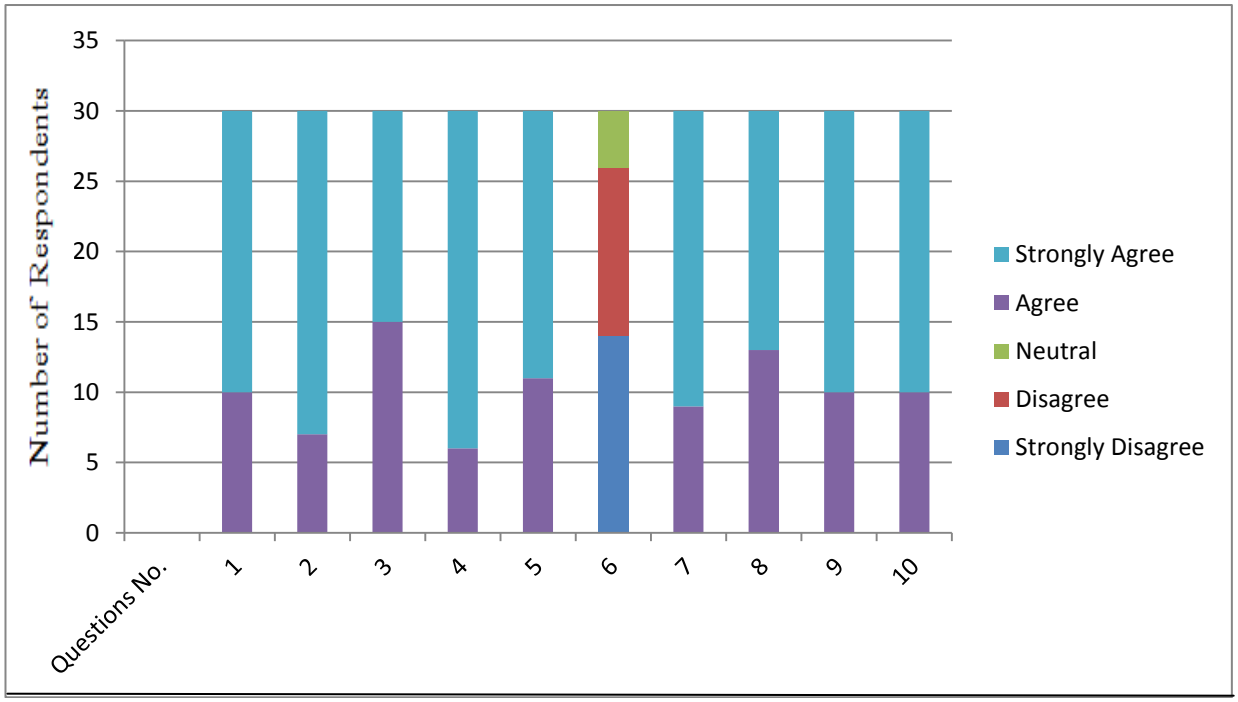


Figure 5.1.2: Graph Bar of the Kinta Tour Guide Webpage after Enhancement

5.2 Analysis of Survey Questions Result

Figure 5.2.1 illustrates the analysis of 30 respondents various cumulative responses which is made according to the first survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide (after enhancement) respectively. Based on the pie chart for the existing system analysis, there are 50% strongly disagree, 30% disagree, 13.33% neutral, and 6.67% of total respondents who are agreeing with the idea that the banner applied in the existing Tour Guide Webpage is suitable to be inserted in the webpage.

On the other hand, the pie chart of the enhanced webpage analysis shows that 33.33% agree and 66.67% of the total respondents are strongly agreeing with the idea that the banner applied in the Kinta Tour Guide Webpage is suitable to be inserted in the enhanced webpage. The survey result shows that the percentage of respondents who agree that the banner in the enhanced webpage is suitable is more than the percentage of respondents who agree that the banner in the existing webpage is suitable. In other words, the result indicates that the designed banner in the enhanced webpage is more suitable to be inserted in the Kinta Tour Guide Webpage than the banner in the existing webpage. A suitable banner to be inserted into the webpage is very important to enable users to know what the website is all about during users' first sight of the banner. The purpose to allow users to have a clear understanding during users' first sight fulfil the Human Computer Interaction (HCI) elements based on Jacob Nielsen's heuristic rule of 'Visibility of System Status'.

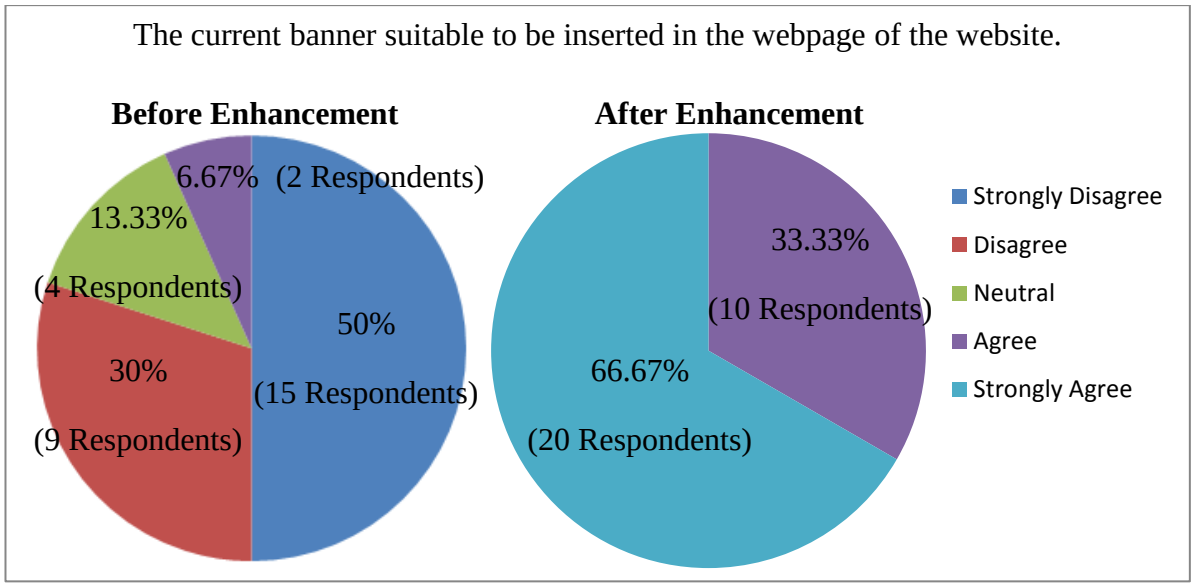


Figure 5.2.1: Percentage shown based on question number 1

Figure 5.2.2 shows the image of the banner in the existing Tour Guide website while Figure 5.2.3 shows the suitable banner to be inserted throughout the enhanced webpage which easily presenting the enhanced webpage is about Ipoh Perak Tourism Webpage. The image of the building used is the famous Ipoh Perak's heritage building.

Figure 5.2.2: Banner of the Existing Tour Guide Website

Figure 5.2.3: Banner of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.4 shows the analysis of various cumulative responses from the 30 respondents which is made according to the second survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 10% strongly disagree, 23.33% disagree, 43.33% neutral, 17.67% agree, and 6.67% of respondents who are strongly agree with that the usage language words and phrases used in the webpage of the existing Tour Guide Webpage are understandable.

On the other hand, there are 23.33% agree and 76.67% strongly agree with that the language words and phrases used in the webpage of the Kinta Tour Guide Webpage after the enhancement of the webpage are understandable respectively. The result shows that the total respondents who are agreeing with that the words and phrases which are used in the enhanced webpage are understandable, are more than the respondents who agree that the words and phrases which are used in the existing webpage of Kinta Tour Guide are understandable. In other words, the words and phrases which are used in the enhanced webpage of Kinta Tour Guide are easier to be understood. According to Jacob Nielsen's heuristic rule of 'Match Between System and the Real World', the language and words used in the webpage is designed to be as simple as possible for deeper and easier to be understood by a wide range of users.

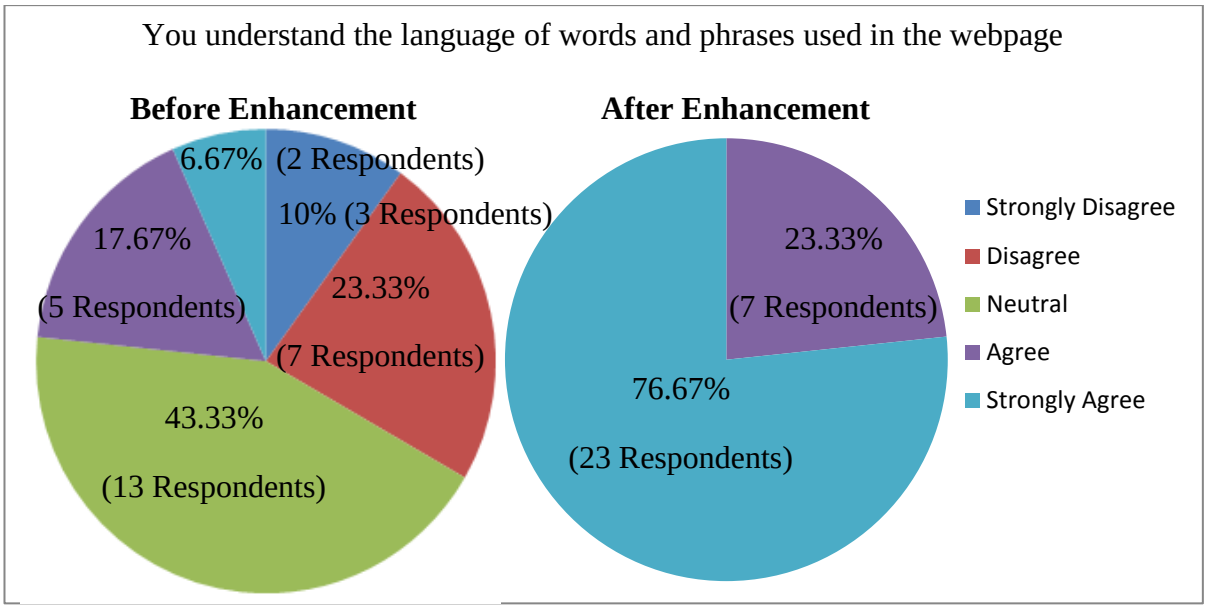
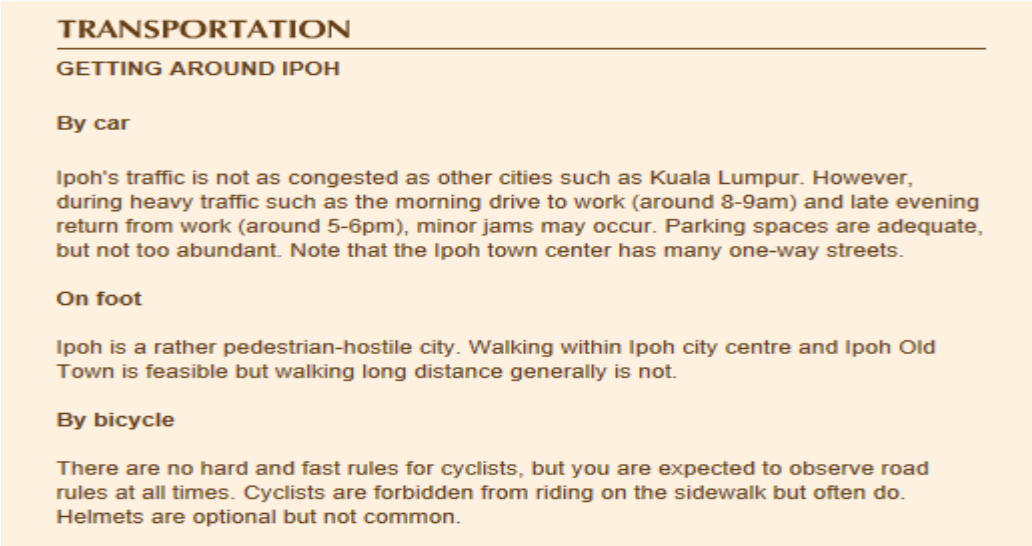


Figure 5.2.4: Percentage shown based on question number 2

Figure 5.2.5 and Figure 5.2.6 show the images of some of the contents which comprises of different types of sentence structures in the existing Tour Guide Website and enhanced Kinta Tour Guide Webpage respectively.



TRANSPORTATION

GETTING AROUND IPOH

By car

Ipoh's traffic is not as congested as other cities such as Kuala Lumpur. However, during heavy traffic such as the morning drive to work (around 8-9am) and late evening return from work (around 5-6pm), minor jams may occur. Parking spaces are adequate, but not too abundant. Note that the Ipoh town center has many one-way streets.

On foot

Ipoh is a rather pedestrian-hostile city. Walking within Ipoh city centre and Ipoh Old Town is feasible but walking long distance generally is not.

By bicycle

There are no hard and fast rules for cyclists, but you are expected to observe road rules at all times. Cyclists are forbidden from riding on the sidewalk but often do. Helmets are optional but not common.

Figure 5.2.5: Language Contents of the Existing Tour Guide Website

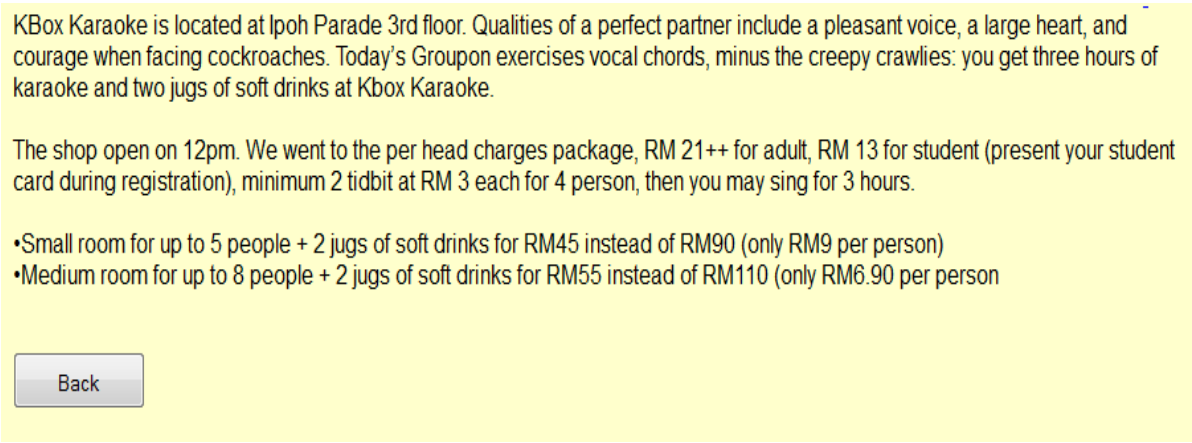


Figure 5.2.6: Simple Language Used of Contents of the Enhance Kinta Tour Guide Webpage

Figure 5.2.7 illustrates the analysis of various cumulative responses from the 30 respondent which is made according to the third survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 30% strongly disagree, 36.67% disagree, 30% neutral, and 3.33% agree with that the existing webpage offer viewers the maximum freedom to control with the usage of hyperlink navigations and control tools such as 'Back' button to link to the previous webpage of the existing Tour Guide Webpage.

On the other hand, 50% agree and 50% of the total respondents are strongly agreeing with that the enhanced webpage offer viewers the maximum freedom to control with the usage of hyperlink navigations and control tools such as 'Back" button to link to the previous webpage of the Kinta Tour Guide Webpage after the enhancement of the webpage. The result shows that the total respondents that are strongly agreeing with that the enhanced webpage offer viewers the maximum freedom to control with the usage of hyperlink navigations and control tools such as 'Back' button to link to the previous webpage of the Kinta Tour Guide Webpage after the enhancement of the webpage are more than the respondents who agree with that the existing webpage offer viewers the maximum freedom to control with the usage of hyperlink navigations and control tools such as 'Back' button to link to the previous webpage of the existing Tour Guide Webpage. In other words, the design of

hyperlink navigations and control tools in the enhanced webpage offers more freedom to the users. According to Jacob Nielsen's heuristic rule of 'User Control and Freedom', 'Next', 'Back', and so on button is very important to enable users to have the maximum control of the system without refreshing a whole webpages in order to look for a tiny specific information.

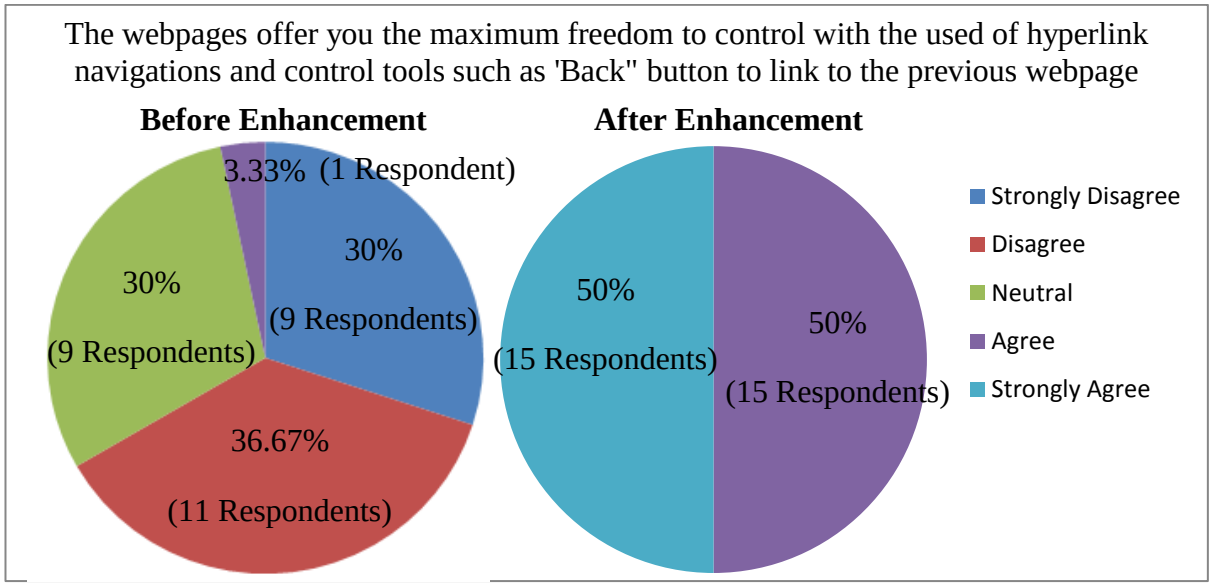


Figure 5.2.7: Percentage shown based on question number 3

Figure 5.2.8 shows the circled arrow icon which acts as a hyperlink 'Back' function while Figure 5.2.9 shows the circled 'Next' button of the webpages that allows users to return to the previous webpage without going back to the homepage.

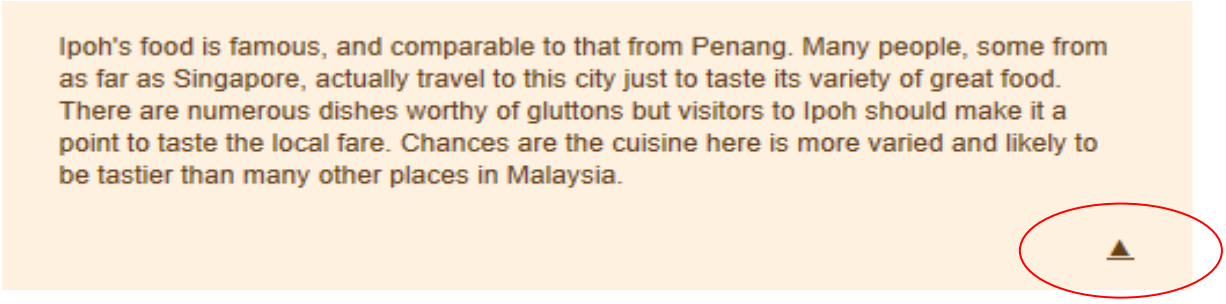


Figure 5.2.8: Arrow Icon as Hyperlink 'Back' Function of the Existing Tour Guide Website

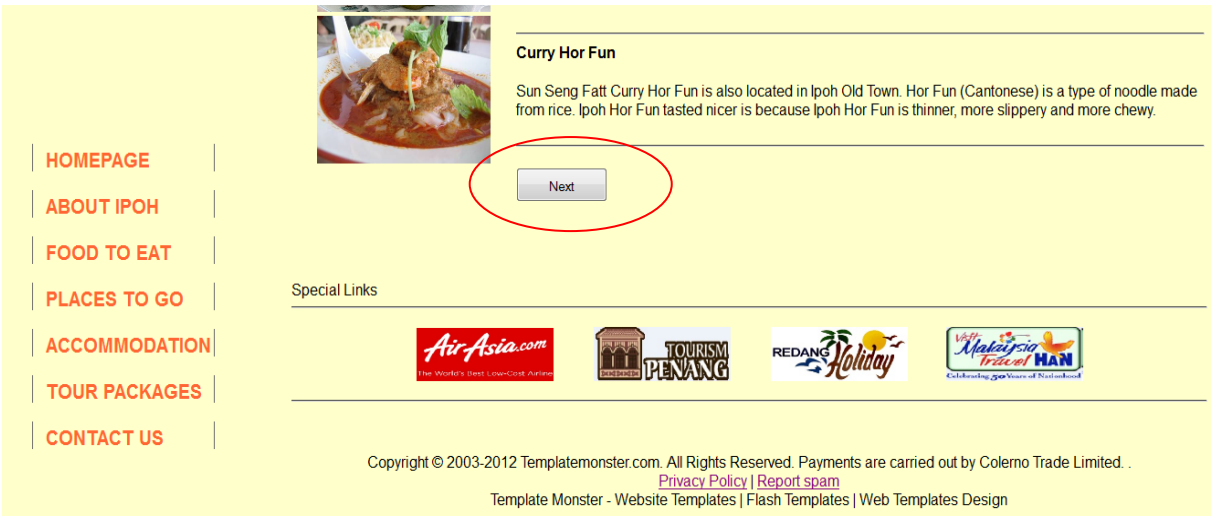


Figure 5.2.9: 'Next' Button of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.10 illustrates the analysis of various cumulative responses from the 30 respondents which is made according to the fourth survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of the Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 6.67% strongly disagree, 33.33% disagree, 30% neutral, 26.67% agree, and 3.33% strongly agree that that the hyperlink navigations lead you to the appropriate information of contents needed of the existing Tour Guide Webpage respectively.

Besides that, there are 20% agree and 80% strongly agree that the hyperlink navigations lead you to the appropriate information of contents needed of the Kinta Tour Guide Webpage after the enhancement of the webpage respectively. According to Jacob Nielsen's heuristic rule of 'User Control and Freedom', the usage of hyperlink navigation help users to link to the needed webpages with a fast manner where the hyperlink navigations are applied on the main menu of the enhanced webpage . Users just have to click to the hyperlink navigations with the selected topic and users will be led to the needed webpage immediately.

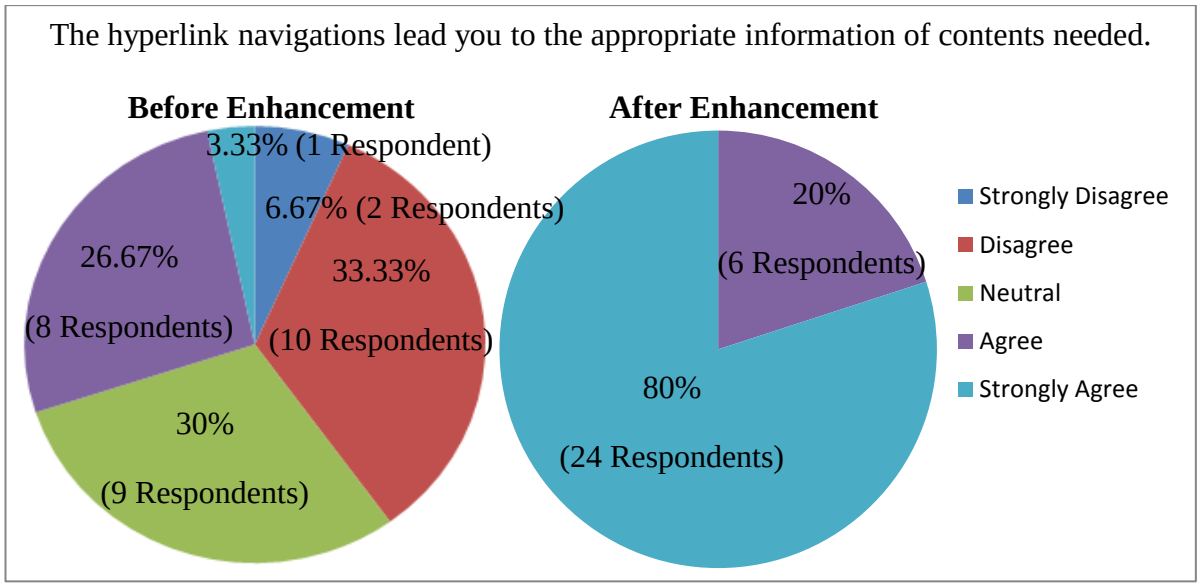


Figure 5.2.10: Percentage shown based on question number 4

Figure 5.2.11 shows the image of the hyperlink navigations that is applied in the 'Jump to A Scetion' menu while Figure 5.2.12 shows the hyperlink navigations which is applied in the main menu of the enhanced webpage respectively.

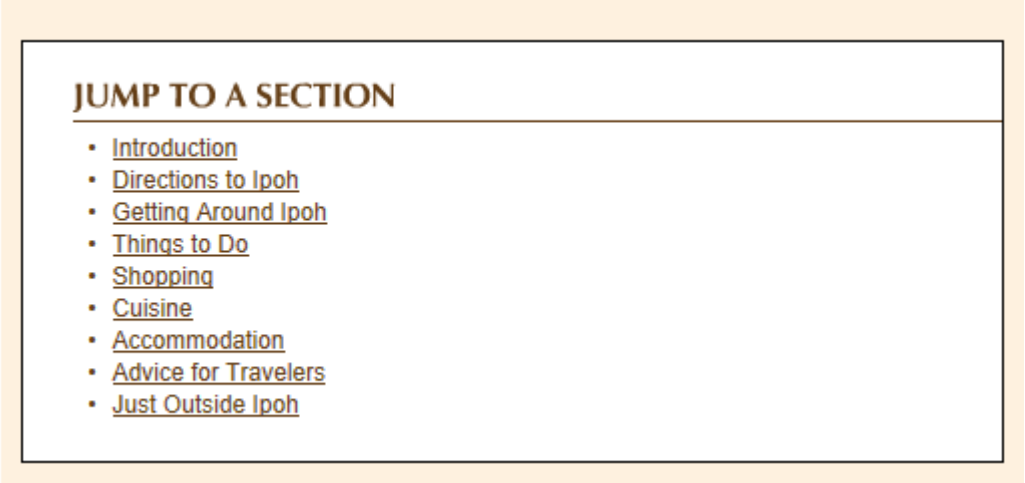


Figure 5.2.11: Hyperlink Navigations Menu of the Existing Tour Guide Website

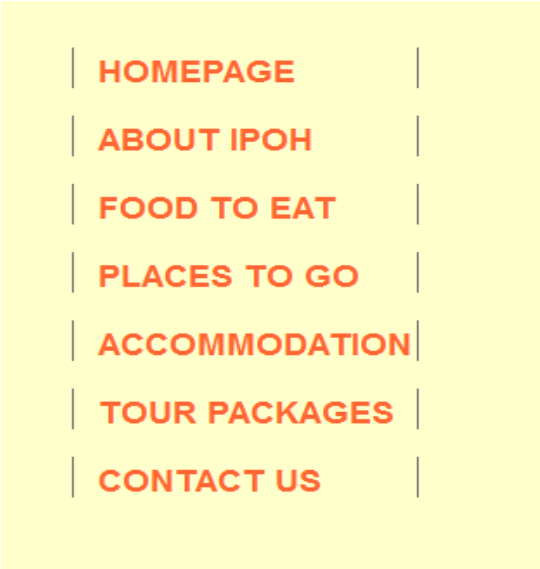


Figure 5.2.12: Hyperlink Navigation Main Menu of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.13 shows the analysis of various cumulative responses from the 30 respondents which is made according to the fifth survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 33.33% strongly disagree, 50% disagree, and 16.67% neutral to that the existing webpage offer the users a good error prevention system to recover from errors such as error messages box. For example, an error message box will pop out when errors occur of the existing Tour Guide Webpage.

On the other hand, 36.67% agree and 63.33% of total respondents are strongly agreeing with that the enhanced webpage offer users a good error prevention system to recover from errors such as error messages box. For example, an error message box will pop out when errors occur of the Kinta Tour Guide Webpage after the enhancement of the webpage. The result shows that the total respondents that strongly agree with that the enhanced webpage offer users a good error prevention system to recover from errors such as error messages box is more than the the total respondents who strongly agree with that the existing webpage offer the users a good error prevention system to recover from errors such as error messages box. In other

words, the Kinta Tour Guide webpage offers a better error control system after being enhanced. According to Jacob Nielsen's heuristic rule of 'Help Users Recognize, Diagnose, And Recover From Errors', the webpage is designed with error message. For example, if the user fills in the user information form wrongly, it cannot be submitted and error message will pop out to help the user to fill up the form correctly. Existing Tour Guide Website is not designed to have pop out error message box.

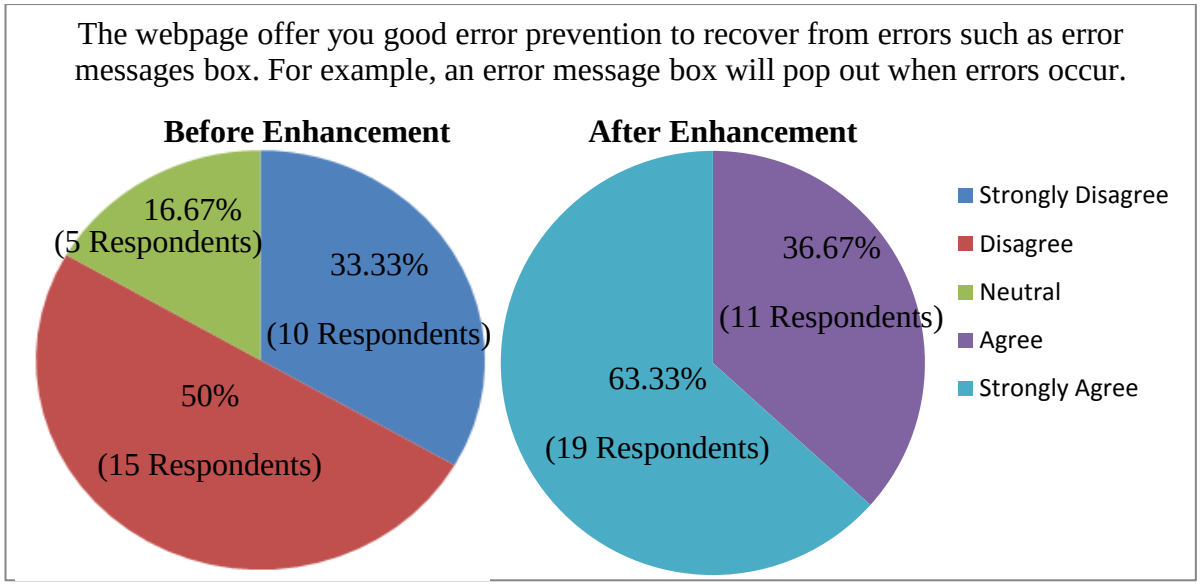


Figure 5.2.13: Percentage shown based on question number 5

Figure 5.2.14 shows the pop out error message box when error occurs in the Enhanced Kinta Tour Guide Webpage.

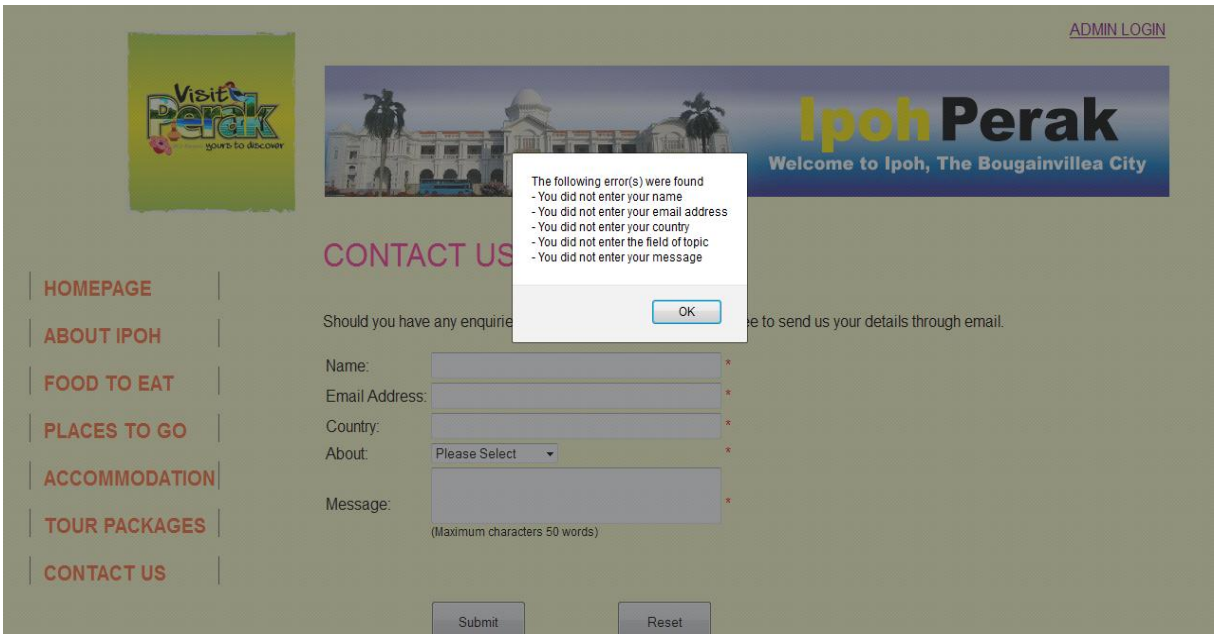


Figure 5.2.14: Pop Out Error Message Box of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.15 indicates the analysis of various cumulative responses from the 30 respondents which is made according to the sixth survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 13.33% neutral, 36.67% agree, and 50% of respondents who strongly agree that the contents of the existing webpage is containing too much of words for Tour Guide Webpage.

On the other hand, there are 46.67% strongly disagree, 40% disagree, and 13.33% neutral with that the contents of the enhanced webpage of Kinta Tour Guide is containing too much of words of the Kinta Tour Guide Webpage after the enhancement of the webpage. According to Jacob Nielsen's heuristic rule of 'Aesthetic and Minimalist Design', too much words will be led to unattractive and bored feeling. Users are wish to look for an attaractive website which compromises many attractive photos, videos, and something interesting compared to dull, wordy and boring website.

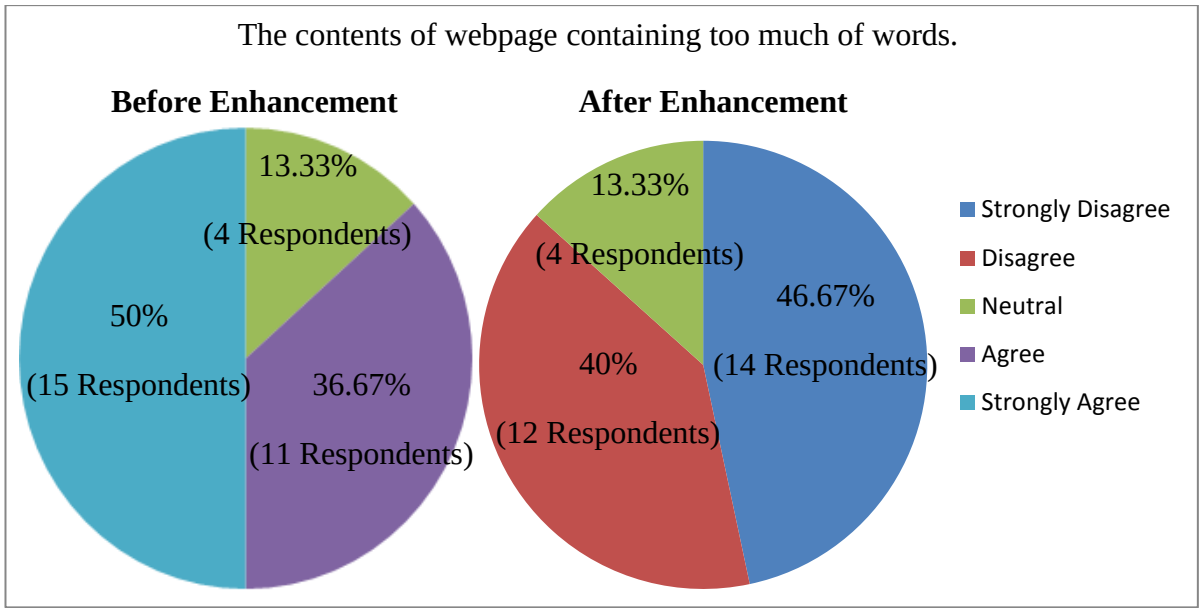
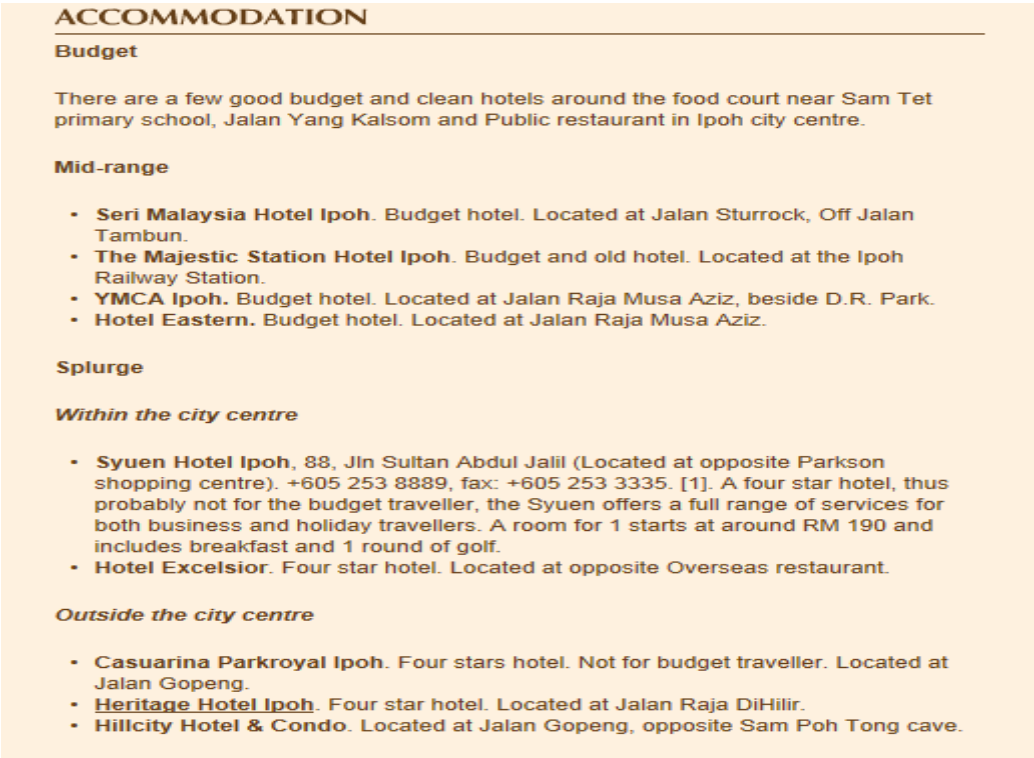


Figure 5.2.15: Percentage shown based on question number 6

Figure 5.2.16 shows the image of the contents of webpage's accommodation while Figure 5.2.17 shows the image of the contents of foods introduction that just comprises of 2 or 3 sentences of contents.



ACCOMMODATION

Budget

There are a few good budget and clean hotels around the food court near Sam Tet primary school, Jalan Yang Kalsom and Public restaurant in Ipoh city centre.

Mid-range

- **Seri Malaysia Hotel Ipoh**. Budget hotel. Located at Jalan Sturrock, Off Jalan Tambun.
- **The Majestic Station Hotel Ipoh**. Budget and old hotel. Located at the Ipoh Railway Station.
- **YMCA Ipoh.** Budget hotel. Located at Jalan Raja Musa Aziz, beside D.R. Park.
- **Hotel Eastern.** Budget hotel. Located at Jalan Raja Musa Aziz.

Splurge

Within the city centre

- **Syuen Hotel Ipoh**, 88, Jln Sultan Abdul Jalil (Located at opposite Parkson shopping centre). +605 253 8889, fax: +605 253 3335. [1]. A four star hotel, thus probably not for the budget traveller, the Syuen offers a full range of services for both business and holiday travellers. A room for 1 starts at around RM 190 and includes breakfast and 1 round of golf.
- **Hotel Excelsior**. Four star hotel. Located at opposite Overseas restaurant.

Outside the city centre

- **Casuarina Parkroyal Ipoh**. Four stars hotel. Not for budget traveller. Located at Jalan Gopeng.
- **Heritage Hotel Ipoh**. Four star hotel. Located at Jalan Raja DiHilir.
- **Hillcity Hotel & Condo**. Located at Jalan Gopeng, opposite Sam Poh Tong cave.

Figure 5.2.16: Accommodation Contents of the Existing Tour Guide Website

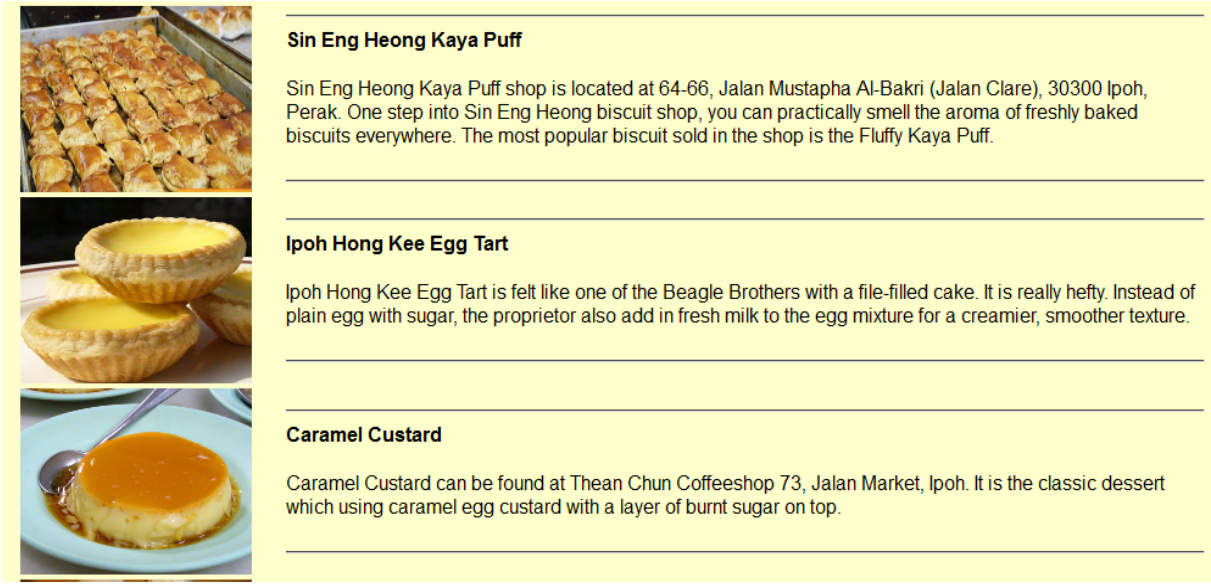


Figure 5.2.17: Few Sentences of Contents of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.18 indicates the analysis of various cumulative responses from the 30 respondents which is made according to the seventh survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 20% strongly disagree, 36.67% disagree, 20% neutral, and 23.33% of total respondents who are agreeing with that the existing webpage's design such as the type of words, font size of words, and page border is suitable for the Tour Guide Webpage website.

On the other hand, there are 30% agree and 70% of total respondents who are strongly agreeing with that the enhanced webpage's design such as the type of words, font size of words, and page border suitable for the Kinta Tour Guide Webpage website respectively. In other words, the webpage design after the enhancement process is more suitable for the Kinta Tour Guide webpage. According to Jacob Nielsen's heuristic rule of 'Aesthetic and Minimalist Design', type of words, font size of words, page border, and webpages' layout have to be consistent and easy to be applied to various kind of users. Type of words used throughout the enhanced Kinta Tour Guide Webpage is San-Serif while users can adjust the font size of contents freely with the icon of size adjustment provided. Font size of the contents

in the existing Tour Guide Website are fixed and no font size adjustment function is being provided in the existing webpage while Figure 5.2.19 shows the image of the circled adjustment icon for the enhanced webpage's contents.

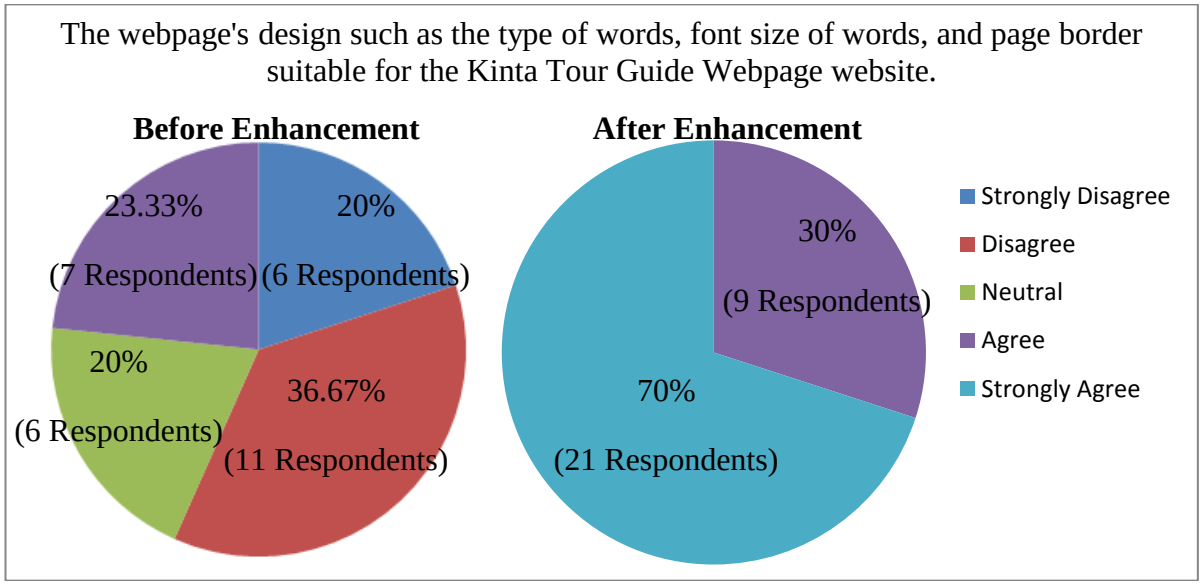


Figure 5.2.18: Percentage shown based on question number 7

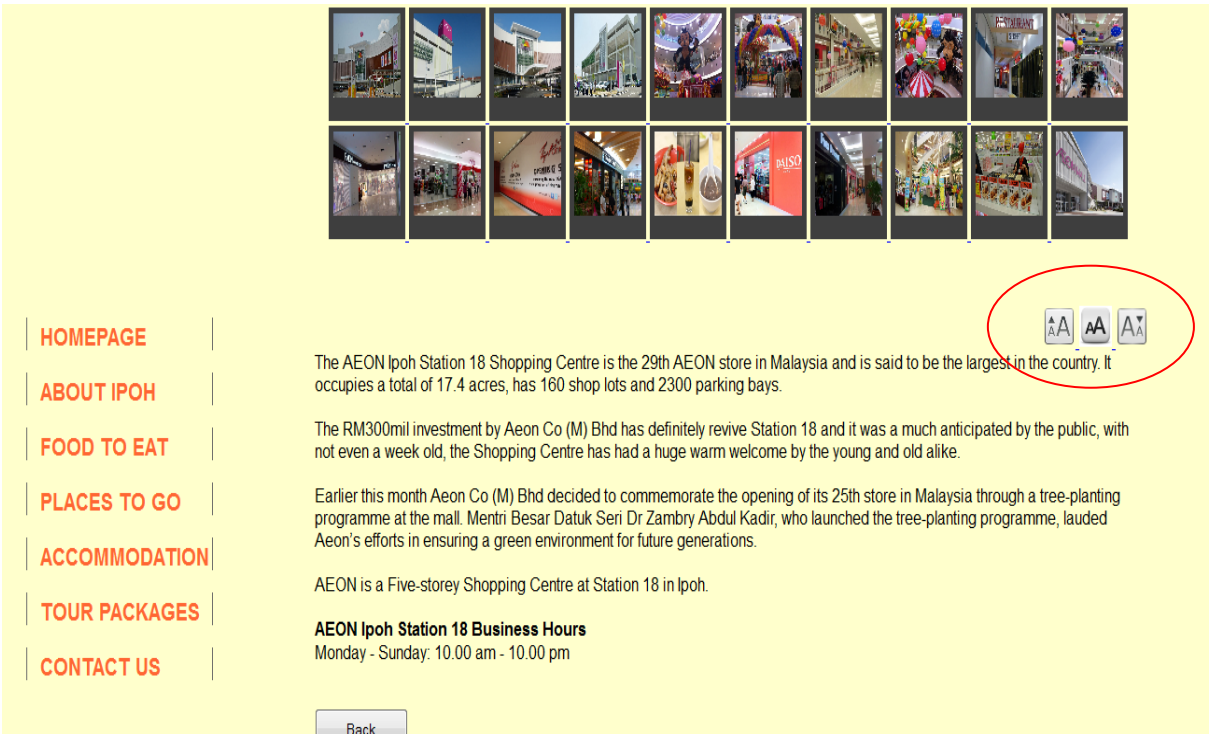


Figure 5.2.19: Font Size Adjustment for Contents of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.20 illustrates the analysis of various cumulative responses from the 30 respondents which is made according to the eighth survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 3.33% disagree, 40% neutral, and 56.67% of total respondents who are agreeing with that the existing Tour Guide Webpage's background colour matches with the colours applied for the webpages' topics' header and contents.

On the other hand, there are 43.33% agree and 56.67% strongly agree that the enhanced Kinta Tour Guide Webpage's background colour matches with the colours applied for the webpages' topics' header and contents respectively. According to Jacob Nielsen's heuristic rule of 'Consistency and Standard', background colour used has to be consistent where the same background colour has to be applied in every webpages. Colours used are considered for colour blinded people. For instances, red, yellow and green are prohibited. Other than that, too bright or dull colours are not recommended.

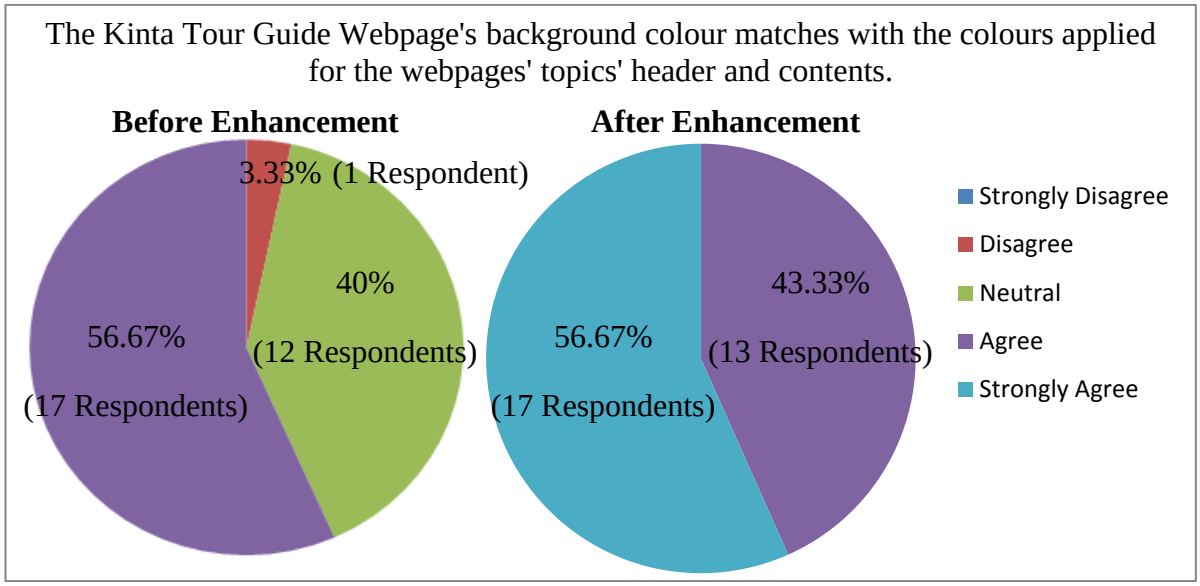


Figure 5.2.20: Percentage shown based on question number 8

Figure 5.2.21 shows the background colour of the existing Tour Guide Website while Figure 5.2.22 shows the background colour of the enhanced Kinta Tour Guide Webpage.

Figure 5.2.21: Background Colour of the Existing Tour Guide Website

Figure 5.2.22: Background Colour of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.23 illustrates the analysis of various cumulative responses from the 30 respondents which is made according to the ninth survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide(after enhancement) respectively. According to the pie chart for the existing system analysis, there are 26.67% strongly disagree, 50% disagree, 16.67% neutral, and 6.67% of the total respondents who are agreeing with that the photos displayed in the existing webpage are designed to provide a clearer visualisation of the given information to the viewer of the existing Tour Guide Webpage.

On the other hand, there are 33.33% agree and 66.67% of total respondents who are strongly agreeing with that the photos displayed in the enhanced webpage are designed to provide a clearer visualisation of the given information to the viewer of the Kinta Tour Guide Webpage after the enhancement of the webpage. According to Jacob Nielsen's heuristic rule of 'Recognition Rather Than Recall', photos displayed to represent the word of contents is more attractive and interesting compared to words. Users will feel easier to visualise the topics through photos displayed.

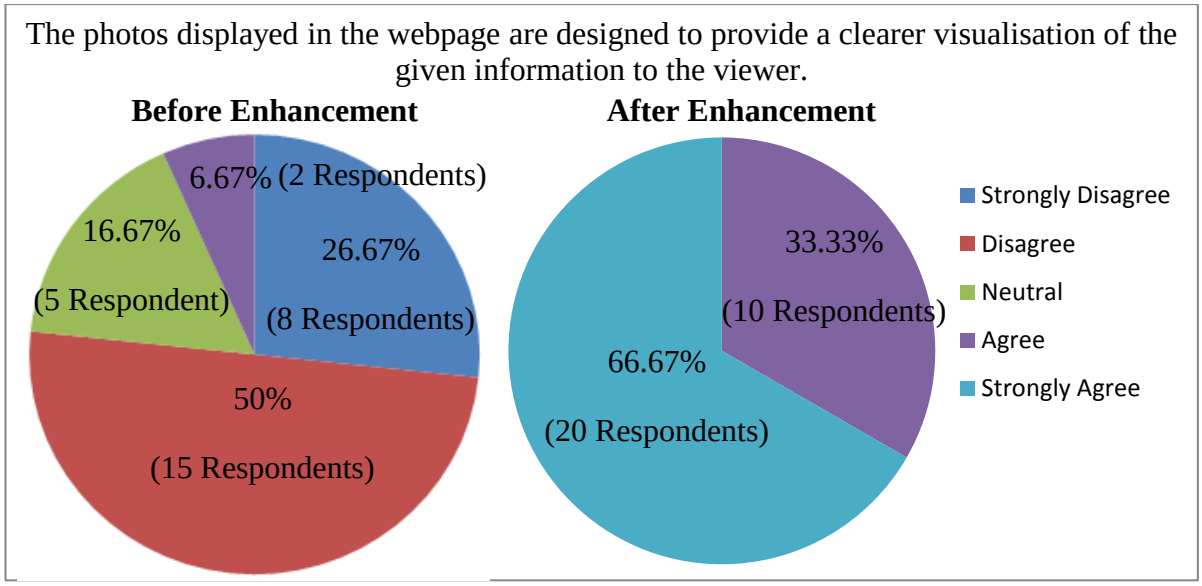


Figure 5.2.23: Percentage shown based on question number 9

Figure 5.2.24 shows that there is only a piece of photo which is being shown to represent the contents in the existing Tour Guide Website while Figure 5.2.25 shows the image of the series of photos which are being displayed to show the Ipoh's cave temple, 'Perak Tong Temple' of the enhanced Kinta Tour Guide Webpage without using much words.

Figure 5.2.24: Only a Piece of Photo Displayed to Represent Contents of the Existing Tour Guide Website

Figure 5.2.25: Photo Displayed of 'Perak Tong Temple' of the Enhanced Kinta Tour Guide Webpage

Figure 5.2.26 illustrates the analysis of various cumulative responses from the 30 respondents which is made according to the tenth survey question based on the existing webpage of Kinta Tour Guide (before enhancement) and the enhanced webpage of Kinta Tour Guide (after enhancement) respectively. According to the pie chart for the existing system analysis, there are 13.33% strongly disagree, 23.33% disagree, 50% neutral, and 13.33% of the total respondents who are agreeing with that the existing webpage offers viewers a standardised and consistent layout design.

On the other hand, there are 33.33% agree and 66.67% strongly agree that the webpage offers viewers a standardised and consistent layout's design of the Kinta Tour Guide Webpage after the enhancement of the webpage. According to Jacob Nielsen's heuristic rule of 'Consistency and Standard', the layout design is very important to have a same design of webpage's layout where the logo, banner, main menu, header of the contents topic, and footer remain the same at every page of the webpages.

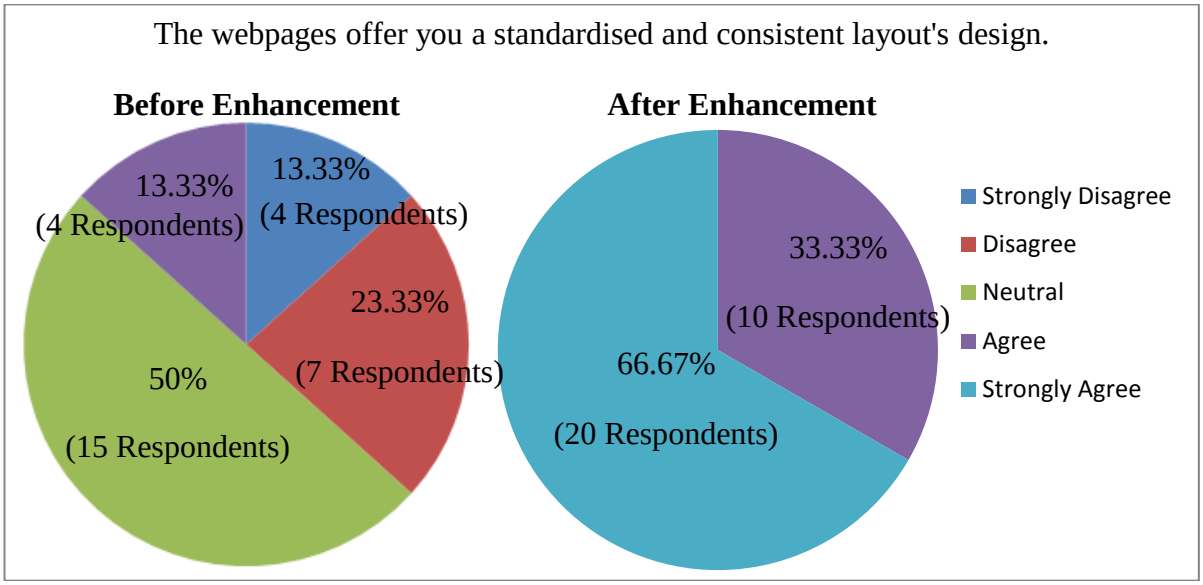


Figure 5.2.26: Percentage shown based on question number 10

Figure 5.2.27 shows the image of the layout design for the existing Tour Guide Website while Figure 5.2.28 shows the logo, banner, main menu, topic's header, and footer of the enhanced Kinta Tour Guide Webpage.

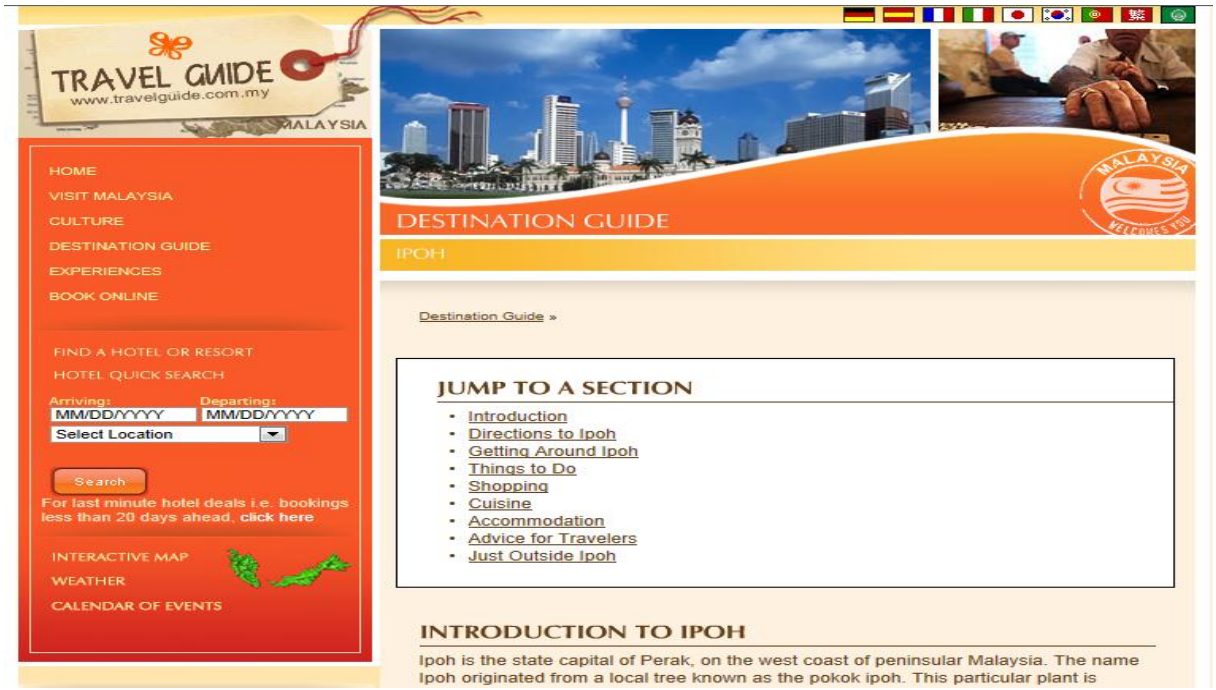


Figure 5.2.27: Layout Design of the Existing Tour Guide Website

Figure 5.2.28: Webpage's Layout Design of the Enhanced Kinta Tour Guide Webpage

CONCLUSION

As a conclusion, the enhanced webpage of the Kinta Tour Guide is indeed more attractive and preferred by viewers. According to the results of the surveys that have been carried out for the existing webpage and enhanced webpage of Kinta Tour Guide, most of the viewers are strongly agreeing with design of the enhanced webpage. In other words, the problems and weaknesses of the existing webpage of Kinta Tour Guide have been accurately targeted and have been successfully overcame by the implementation of the Jacob Nielsen's Heuristic Rules.

CHAPTER 6

CONTRIBUTION, LIMITATION, FUTURE RESEARCH & CONCLUSION

6.1 Contribution

An amount of efforts have been contributed in the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system. A lot of time has been spent in order to develop the project. Many researches have been done to get deeper knowledge of Human Computer Interaction (HCI). Time needed to understand the difference between the types of rules in Human Computer Interaction (HCI) field.

In order to write a report for the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen System, meeting with supervisor once a week is compulsory to ensure that the report is correctly written and rules are ensured to be applied in the correct way. Advices from supervisor are used as guidance and try to improve if there is any mistake or errors occur. Always discuss with supervisor when facing problems or difficulties when developing or writing for the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system report.

Moreover, appointments and meetings have been made with other lecturers who are professional in the particular field in order to obtain different kind of advices and guidance. It is a benefit to get new ideas and opinions from different experts as

an additional knowledge of the system design which can be applied into the system enhancement process. In additional to that, the survey questions for the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system are conducted to 30 respondents provide defer opinions and requirements among respondents which consist of different kind, level and status of people.

6.2 Limitation

The limitations faced during the development of the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen are as following:

a. The time to finish the project is limited as the time given is just one semester period of lecture time. Besides that, there is a need to allocate time for other projects and assignments for other subjects too.

b. In order to conduct the second survey questions to 30 selected respondents during the first survey done, the respondents consist of 15 non-IT background UMP students, 5 UMP FSKKP lectures, 5 IT background UMP students, and 5 randomly chosen students. There is a need to redo the first and second survey to a new chosen group of respondents. This is due to the failure to upload the enhanced system into UMP server as UMP server is failed to support ASP.Net application. The problem occurred has prevented the second survey to be conducted to the same group of respondents where most of the respondents are outsider which is not belonged to UMP students. It is difficult to look for the respondents from different state and city due to transport facilities problem and time constraints.

c. Due to the lack of knowledge in Human Computer Interaction (HCI) elements by Jacob Nielsen gained, it is hard when applying the heuristic rules

into the enhanced system. For examples, not sure where should the rule be applied on and not sure the rule applied onto the correct part.

d. There is a limit for administrator functions. According to some expert of Human Computer Interaction (HCI), the main function of the developed system is concern about the design of system based on the heuristic rules by Jacob Nielsen where the designed system is convenience to be used by either experienced users or inexperienced users. The enhanced system should be easy to use and understandable. Based on the reason mentioned above, administrator functions for the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system are registration for new account, updating the table information of database's system, and logout from the database administrator's page.

e. There is a comment from expert lecturers on the enhanced system's main menu design which contain a big white space between the main menu from the top line's page when the users scroll the page upwards or onwards as the main menu is set to be 'fixed' where the main menu looked like is moving when users scroll the page upwards and onwards. Many guidance and advice given by the expert lecturers to overcome the problem the white space but it is still a failure to recover the problem. As the time given is limited and to overcome the white space, there is required a lot of time for exploring.

6.3 Future Research

For future research of the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system, it is recommended to enhance the administrator functions where administrator can edit all the information of contents of the website. For instances, administrator can edit the information of contents, uploading new photos, and so on without opening the whole folder of system application and edit at the coding parts.

Besides that, add in the comment function on the photo displayed under certain specific topics where users are free to leave a comment on the space provided either next to the photo displayed or beneath the photo displayed. The design of the comment function can refer to the 'Facebook' as guideline. The design of the suggested idea can make the webpage look lively like chatting, more attractive and users won't feel boring just by viewing the photos.

The Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system can offer for the accommodation online reservation function where interested users can straight away make reservation for the ideal hotels through the accommodation online reservation by filling all the requirement information details and click 'Submit'. Users can pay online or bank in the accommodation fees. Users will be provided a printed receipt via the Enhancement of Tour Guide Webpage for Kinta Tour Guide Webpage based on Human Computer Interaction (HCI) elements by Jacob Nielsen system. Users just have to bring along and show the receipt to the receptionist of the selected hotels.

Moreover, in order to display only photos with different kind of JQuery effect, the enhanced system is recommended to allow users to view the photos which are being displayed via video. Video displaying photos or events make the system look lively and more attractive. Although video displaying is more attractive, time loaded for the video usage has to concern at as long loading time of certain application throughout a system is a serious mistake where system designers are avoided to apply into the enhanced system base on the Human Computer Interaction (HCI) elements.

Further enhancement can be done by using the other three rules within the Jacob Nielsen's Heuristic Rules which includes 'Flexibility and Efficiency of Use', 'Help Users Recognize, diagnose and Recover from Errors' and 'Help and Documentation'. Those rules can help to speed up the interaction between the viewers and the system, provide error message precisely in the enhanced webpage and can help in an easier way to search for information. Last but not least, HCI is

able to be applied in order to enhance and improve the relationship between human and computer.

6.4 Conclusion

As a conclusion, not every existing system which is being published in the Internet can fulfil Internet users' requirements and some of the webpages even not managed to be understood by the users. Hence, those are the webpages that fail to reach the users' main goal in supplying information to the Internet users especially regarding to the tour guide webpage such as the Kinta Tour Guide webpage. Thus, a suitable method or rules must be used to evaluate the existing webpage and enhance the webpage into a better webpage for the users. In the project of Enhancement of the Tour Guide Webpage Based on HCI Elements for Kinta Tour Guide Webpage, the most suitable rule to be applied is the Jacob Nielsen's Heuristic Rules. After the webpage of Kinta Tour Guide has been enhanced, more Internet users are attracted to view the page and the enhanced webpage has been more convenience for the viewers. Besides, the enhanced webpage is more informative, creative and innovative. The Kinta Tour Guide webpage is creatively designed and compact with useful details. All the contents in the enhanced webpage are clear, simple and straight forward. Therefore, the enhanced Kinta Tour Guide webpage is very helpful for the travellers who are interested to visit Ipoh, Kinta. As a circumstance, the enhanced webpage is undeniable that the webpage can assist in increasing the number of tourists from around the world to visit Malaysia. In other words, a well-established tour guide webpage can help in developing the Tourism Industry of Malaysia along with the slogan of 'Cuti-cuti Malaysia'.

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APPENDICES

APPENDIX A:

GANTT CHART

APPENDIX B:

SURVEY QUESTIONS 1

Survey Questions 1

Existing Website: http://www.travelguide.com.my/guide-ipoh.htm

1. The current headre suitable to be inserted in the webpage of the website.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

2. You understand the language of the words and phrases used in the webpage.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

3. The webpage easy to be controled and it offers you the maximum freedom to manage it with the used of hyperlink navigations.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

4. The webpage's flow of contents is standardized to be a page that is suitable for travelling guidance.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

5. The arrow of navigation located at the bottom of the right hand side convenience for you.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

6. The content of the webpage containing too much words.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

7. The hyperlink navigations lead you to the appropriate information needed.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

8. The webpage's design such as the type of words, font size of words, and page border suitable for tourism webpage.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

9. The Ipoh tourism webpage's background colour matches with the displayed photos.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

10. The webpage offers you an easy and a quick search of information needed.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Comments:

Signature,

_____

( )

APPENDIX C:

SURVEY QUESTIONS 2

Survey Questions 2

1. The Kinta Tour Guide Webpage's banner suitable to be inserted in the webpage of the website.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
   Comments:

2. You understand the language of words and phrases used in the webpages.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
   Comments:

3. The webpages offer you the maximum freedom to control with the used of hyperlink navigations and control tools such as 'Back' button to link to the previous webpage.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
   Comments:

4. The hyperlink navigations lead you to the appropriate information of contents needed.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
   Comments:

5. The webpages offer you good error prevention to recover from errors such as error messages box. For example, an error message box will pop out when errors occur.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
   Comments:

6. The contents of webpage containing too much of words.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
   Comments:

7. The webpage's design such as the type of words, font size of words, and page border suitable for the Kinta Tour Guide Webpage website.

   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

   Comments:

8. The Kinta Tour Guide Webpage's background colour matches with the colours applied for the webpages' topics' header and contents.

   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

   Comments:

9. The photos displayed in the webpage are designed to provide a clearer visualisation of the given information to the viewer.

   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

   Comments:

10. The webpages offer you a standardised and consistent layout's design.

    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

    Comments:

Signature,

_____

( )

APPENDIX D:
RESULT OF SURVEY QUESTION 1 (BEFORE ENHANCEMENT)

APPENDIX E:
RESULT OF SURVEY QUESTION 2 (AFTER ENHANCEMENT)