COLLABORATIVE-BASED WEB RECOMMENDER SYSTEM FOR COMMUNITY-DRIVEN HOMESTAY PROGRAMMES

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Abstrak

Program Homestay adalah sejenis inisiatif pelancongan yang mana penduduk tempatan menjemput pelancong untuk berinteraksi dengan mereka dan mengikuti aktiviti harian masyarakat dan budaya, termasuk pilihan untuk penginapan. Kesan program homestay kepada masyarakat dapat dilihat melalui pembangunan ekonomi, modal sosial, infrastruktur dan alam sekitar. Oleh itu, program homestay menggalakkan pelancongan berasaskan komuniti (CBT) dan bertindak sebagai pemangkin kepada pembangunan masyarakat luar bandar. Kebanyakan program homestay terletak di kawasan luar bandar, dan dengan itu, secara langsung dapat memperkenalkan pelbagai budaya Malaysia. Walaupun pelancongan homestay adalah industri yang semakin meningkat di negara membangun, namun terdapat beberapa cabaran yang dihadapi dalam pengendalian program homestay di Malaysia, memandangkan CBT ini tidak dapat berkembang seperti mana inisiatif pelancongan lain. Semua cabaran ini telah membawa kepada punca utama, iaitu, kekurangan promosi dan pemasaran disebabkan oleh ketidakupayaan pengusaha homestay untuk menggunakan teknologi. Oleh itu, untuk mengatasi masalah ini, satu sistem baru, iaitu sistem *Collaborative-Based Web Recommender* (CBWR) yang memenuhi kriteria tertentu untuk penyampaian perkhidmatan homestay yang berkesan dan cekap dibangunkan. Sistem CBWR ini bertindak sebagai rangkaian pangkalan data yang berfungsi sebagai perantara antara pengguna (pengunjung) dan pembekal perkhidmatan, iaitu, pengusaha program homestay. Tambahan pula, CBWR ini juga boleh mewujudkan perkongsian antara pangkalan data homestay dan laman *web recommender* homestay dengan mengumpul butiran pengguna dan menyimpannya, yang mana dilakukan oleh *profiler*. Seterusnya, kriteria yang sesuai diwujudkan. Semua operasi ini dijalankan serentak untuk meningkatkan fungsi sistem CBWR ini. Justeru itu, kajian ini menyumbang kepada pembangunan pangkalan data web tertentu dan sistem CBWR. Selain itu, sistem CBWR ini menyediakan algoritma *recommender* sokongan yang dijalankan dalam persekitaran yang membolehkan dan menyokong web dalam masa sebenar. Dengan itu, pengguna boleh melayari program homestay yang tersedia dengan keunikan produk serta perkhidmatan yang ditawarkan.

Kata kunci: Program homestay, Pelancongan berasaskan komuniti, Promosi homestay, Sistem Collaborative-Based Web Recommender

Abstract

A Homestay Programme (HP) is a kind of tourism initiative where local residents welcome tourists to stay and interact with them and experience the community's daily activities and culture, including an option for lodging. The effects of HPs on the community are reflected in the development of the economy, social capital, infrastructure and environment. Hence, a HP promotes community-based tourism (CBT) and acts as a catalyst for rural community development. Most HPs are located in the rural areas, and thus, are directly linked to showcasing the various Malaysian cultures. Although homestay tourism is a growing industry in developing countries, there are some challenges faced in operating the Malaysian HPs since this CBT does not seem to be flourishing in a similar manner as the other tourism initiatives. All of these challenges have led to the main cause that is, lack of promotion and marketing due to the inability of homestay operators to utilize technology. Therefore, to overcome this, an enhanced Collaborative-Based Web Recommender (CBWR) system that meets certain criteria for an effective and efficient homestay service delivery is developed based on the user and item approach. This CBWR system acts as a database network that serves as an intermediary between users (visitors) and the service providers, who are the HP operator. Furthermore, this CBWR can also create a partnership between the homestay database and the homestay recommender website by capturing the users' details and storing it, which is done by the profiler. Consequently, the profiler recommends several websites that suit to the user's request. All these operations are carried out simultaneously to boost the functions of the CBWR system. Hence, this research contributes to the development of a specific unique web database and a CBWR system, which is adopted from collaborative algorithm. In addition, the CBWR system provides a supportive recommender algorithm which is carried out in a web enabling environment in real time. This enables users to find the available personalized website and unique HPs with their signature products and services.

Keywords: Collaborative-Based Web Recommender system, Homestay programme, Community-Based Tourism, Homestay promotion

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Table of Contents

List of Tables

List of Figures

List of Appendices

CHAPTER ONE
INTRODUCTION

The United Nations World Tourism Organization (UNWTO), in its publications, shows that the tourism industry has experienced sustained development and diversity to become the biggest and most rapidly growing economic sector of the many sectors in the world (UNWTO, 2013; Tan, Sasidaran & Ye, 2016). Tourism has become one of the instrumental forces for a country's socio-economy progress (Platzer, 2014). Tourism has been able to produce an estimated gross production of US $7.2 trillion (WTTC, 2016). The tourism industry has bright prospects based on the World Tourism Organization (WTO) report which stated that two billion tourists have travelled around the globe in 2015. Tourism is advancing rapidly and contributing to the growth of not only developed countries but developing countries as well. Furthermore, tourism and its potential for developing countries have been determined as a significant predictor for the growth of global tourism (Palmer, 2002; Honey, 1999; Mowforth & Munt, 1998).

1.1 Tourism in Malaysia

The tourism is the second biggest contributor to the Malaysian economy. The efforts taken by Malaysia for the growth of and in promoting tourism have produced notable outcomes. In the year 2013, 25.72 million tourists visited Malaysia resulting in a RM 65.44 billion income to its economy. This amount represents a growth of 11% in the number of tourists and 10.4% in earnings in comparison with year 2012. The growth is considered remarkable provided the problematic and challenging situation

domestically, accompanied by the economic slowdown in the world and the rise of the price of oil in the year 2012.

Tourism has made its presence felt in Malaysia for quite some time, and the reason behind it is because its products are nature and culture-based, especially in the rural areas. Tourism, in most developing countries, generally contributes to the growth of small-scale enterprises, and that directly enhance the standard of living (Honey, 1999). It also facilitates the development of any community, and one of its major contributions is employment opportunities.

1.1.1 Employment Opportunities

The industry related to tourism generally has significant impact on the growth of the Malaysian economy and social development of the country. Of late, the tourism sector has become a source of employment with potential of about 956,000 jobs related to the industry (WTTC, 2017). In addition to that, it is a facilitator of rural and urban redevelopment. A study by Briedenhann and Wickens (2004) shows that many developing countries view tourism as a vehicle for diversifying their economic bases. In order to establish or develop an industry which is associated with tourism, communities that are in rural areas are striving to change from a commodity production economy to a consumption economy (Gill & Reed, 1997). Tourism has the potential to contribute positively to an economy.

1.1.2 Community Development

The people of a community work in groups to improve the future prospects of their respective communities. The growth of a community is known as community

development. Community development concerns economic growth and the organization of the community. This is the procedure whereby members of a community work in groups to perform action collectively and produce answers to problems that are common in nature (Etzel, 2003). The standard of living of people from the rural area will see growth in tandem with the development of the community. One way to enhance this standard is through tourism activities that are related to the community. There are many forms of tourism, such as ecological tourism (ecotourism); green tourism; rural tourism and agro-tourism; community tourism; equitable tourism; and solidarity and responsible tourism. According to Liu (2007), community development works as an alternative to help develop the standard of life of the rural people and to bring about positive changes. Another study by Jones (2008) shows that the enterprises which are small or medium sized are able to develop to the extent of the progress associated with the society or community (Liu, 2007; Jones, 2008). Community development can directly improve the economy in the non-urban areas. This initiative is a component of community based tourism (CBT).

1.2 Community Based Tourism

Community Based Tourism (CBT) is a tourism initiative which involves the participants of a community with the aim of improving the livelihood of the community (Hall, 2000; Nyaupane, Morais & Dowler, 2006). In order to improve tourism in a manner which is more appropriate to the rural community, CBT has come to the forefront and is also suggested by Harris (2009). CBT is a diversified mechanism that changes the general livelihood of a community (Mizal, Fabeil and Pazim, 2014) and is an essential tool for rural tourism (Alves, Bcerro & Martins, 2010) where opportunities have a greater impact on the community.

The involvement of the community under CBT includes many strategies (tourists and demand, community and location and tourism destination) which can help the non-urban areas particularly to grow and partake in the tourism sector nationally (Amin & Ibrahim, 2015). One of the tourism strategies which is based on the community is the homestay programme (HP) in the non-urban areas.

1.3 Homestay as CBT

Homestay is a form of accommodation whereby visitors will get the chance to stay with a chosen house owner or host. Similarly, homestay is a place to stay at a residence by a traveler and especially by a visiting foreign resident who is hosted by a local family (Mapjabil & Ismail, 2012). Furthermore, Lanier and Bermanis (1993) define that homestay as a home in which rooms are rented for the purpose of supplementing income. Many of the homestays in Malaysia are privately-owned and not confined in the rural and city outskirts. However, the HP, from the Malaysian perspective, is a group of villagers who are certified to operate the HP by the Ministry of Tourism and Culture (MOTAC), Malaysia. A study shows that in the 1970s, the HP began informally in Malaysia with some involvement of the local communities who provided accommodation in their own homes to foreign tourists by charging a very minimal price compared to hotels or resorts (Hamzah, 2008; Kayat, 2008; Ibrahim and Razzaq, 2010). The HP is a form of tourism initiative where local residents welcome tourists to visit their community with the provision of overnight accommodation provided in their residences (Brohman, 1996; Hatton, 1999). Tourists will experience local community life and other experiences for a certain amount of payment to the host or local resident (Tosun, 2009). A HP is considered as a promotion of CBT, which also serves as an option for lodging. This means tourists

can stay with chosen families, interact with the locals and experience the daily activities and culture of the host country. A Homestay programme is one of the programmes out of many programmes, under CBT (Mapjabil, 2010).

This kind of optional accommodation for tourists is also known by various other terms, such as farm stay (Sherpley & Sherpley, 1997); culture homestay (Laffer, 1981); heritage homestay; quality life homestay; education homestay (Richardson, 2002); voluntary homestay (Albaladejo-Pina & Diaz-Delfa, 2009); private accommodation; leisure stay; and cottage stay (Albaladejo-Pina & Diaz-Delfa, 2009; Barnett, 2001; Goh, 2008).

Homestay tourism, which is generally referred to the HP perspective in this thesis, offers alternative accommodation facilities to the tourists as well as to Malaysians. Based on this homestay concept, its implementation involves the local community. Therefore, the impact of the programme on the local community is indirectly related to the impact on Malaysian tourism. The HP is therefore another important tourism product. A HP is initiated by those who are at the grass roots level, and these people prepare facilities and services for a tourist during his/her stay in the community to experience the everyday way of life of the family and the community in both a direct and indirect manner (Homestay Guidelines, 1995).

Since most HPs are in rural vicinities or outskirts of big cities, their activities are mostly culture-related, and it is therefore normally regarded as a rural-cultural-community-based tourism product (Hu, Chancellor & Cole, 2011). The HP promotional banner would state that guests can experience rustic life in a village, the

activities of their host in daily life, including home-cooking lessons, fruit harvesting during fruit seasons, playing traditional games (Hunter, 1997), and so on and so forth, all of which come under CBT.

Abdul Kadir and Abd Rashid (2010), in their study, show that through the HP, rural communities are encouraged to organize among themselves to transform their residence into homestay facilities and offer hospitality services to local and international tourists. The HP is an activity that occurs in a rural area and is directly linked to Malaysian culture (Yunis, 2004). The money paid to the host family includes accommodation, meal and organized cultural lifestyle and leisure activities and jungle trekking. Many prior studies (Zhong, Deng, Song & Ding, 2011; Kim, Uysal & Sirgy, 2012; Zhang & Lei, 2012) have shown that homestay planning has undergone a significant evolution in development and planning that is more comprehensive, flexible, responsive, systematic and participatory. This evolution has become an agent of cultural and economic development, especially in rural community development. The HP works as a catalyst for rural community development. The effects of the HP towards the community can be seen in the development of the economy, social capital, infrastructure and environment. Based on studies done by Yunis (2004) and Ashley (2001), homestay tourism is growing faster in developing countries than in the developed countries, and there are many reasons why homestay tourism is particularly well placed to meet the needs of the rural people. However, there are some challenges to operate HPs in Malaysia such that they become success stories, which enjoy the vast tourism‘s economic cake.

1.4 Challenges on HP

The HP faces many challenges. For example, it does not enjoy certain economic benefits. There are some challenges and problems for this programme to be successful, which are discussed below, such as low number of visitors, lack of promotion, and inability to utilise technology.

1.4.1 Low Number of Visitors

Tourists play an important role in the HP but a study by Kayat (2008) shows that the number of tourists is decreasing daily in HPs in Malaysia and this is agreed by Amin and Ibrahim (2015). One of the reasons behind this, as stated by Hall, Kirkpatrick & Mitchell (2005), is the lack of preparedness for the changes associated with tourism and limited opportunities, leading to a huge decrease in the number of tourists. Only tourists can contribute to the growth of tourism. Community Based Tourism improving mechanisms are used to empower people to take part in community development. A recent study (The star online, 2014) has shown that there is increasing conflict in the management of tourism in Malaysia faced by tourism managers, stakeholders, governments, cultural heritage managers and the local community itself, to the extent that international tourists are losing interest in Malaysian tourism, contributing subsequently to a decrease in the number of incoming tourists. In order to maintain, conserve and preserve the resources and assets of tourism in Malaysia, a system or management needs to be developed (Ayob & Masron, 2014), that will take into consideration all issues and challenges faced, so that the decision-making process is able to optimize the values of the tourism industry in Malaysia. A good system of management can increase the number of tourists, but lack of promotion will be an obstacle to overcome as well.

1.4.2 Lack of Promotion

Promotion plays an important role in the marketing process. The HP in Malaysia is facing problems due to lack of promotion in the media (Millar, 1989; Hardy, 1990; Amin & Ibrahim, 2015). Consequently, this lack of promotion for tourism in Malaysia badly affects the number of visitors (Lordkipanidze, Brezet and Backman, 2004). Lack of advertising is a problem in the HP in Malaysia (Abu Hassan and Omar, 2009) as well. Promotion with the aid of technology, such as the Internet can overcome the problem (Hoffman and Novak, 1996). Therefore, by the advance of internet-based promotion can promote the HPs all over Malaysia and worldwide.

1.4.3 Inability to Utilize Technology

Study by Ibrahim (2013) shows that the current homestay administrators and operators do not use technology because they do not have proper guidance. As shown by Buhmann (2001), the ability to use technology can contribute to developing the HP. According to Gnaniah, Stan and Stephen (2006), several projects have been introduced to the community to familiarize homestay owners with technology. But homestay operators need to have awareness of technology in order to be able to use the various types of technologies which can improve their HPs and promote Malaysia as a place to visit.

Technology awareness is very important for homestay operators and administrators (Ibrahim, 2013). Most homestay owners and operators are not aware or not well exposed to the technology that is available to help them with their homestay business initiatives. The lack of technology awareness related to homestay amongst operators in Malaysia is being recognized, and this awareness is highly needed for the operators

and administrators of homestay in Malaysia (Yusof, 2012). However, there are other challenges that are related and need to be overcome, such as low skills and capabilities of homestay operators or owners.

Studies by scholars (Herrero & Martin, 2012; Inversini, Rega, Pereira & Bartholo, 2015) have shown that among the rural communities, most of the people have low skill levels and technology adaption. Homestay operators are still using a paper-based system for managing their operations (Hamzah, 2008). In addition, homestay operators or owners have been slow to adopt information and communication technologies (ICTs) to increase their market value (Alam, 2009). In fact, there is a clear disparity in the diffusion of ICT among rural homestay communities (Bhuiyan, Siwar and Ismail, 2013). Furthermore, the lack of ICT usage is because the rural community's knowledge of ICT and skills is at a lower level compared to city dwellers. This is also caused by low connectivity and literacy rates (Mohamad, Lo, Songan, and Wee, 2010).

1.5 Promotion and Marketing

In relation to the challenges which lead to the main issue of technology usage in promoting and marketing the HPs, there are five types of internet-based promotion approaches introduced. They are collaborative-based recommender, content-based recommender, demographic-based recommender, utility-based recommender and knowledge-based recommender. Brief description of each approached is given but further details of these approaches are discussed in section 3.4.

1. Collaborative-based recommender system is based upon finding similarities among users (Chien and George, 1999). To do that, there must be a generated profile for each user (Burke, Mobasher, Bhumik & Williams, 2005; Logesh and Subramaniyaswamy, 2016). As shown by Michael, John and Joseph (2010), collaborative-based recommender is an effective recommender system that predicts on the basis of the behavior of other users in the system and ratings. Furthermore, this recommender system is able to forecast based on the conduct of other users‘ assessments (Burke, Mobasher, Bhumik & Williams, 2005). In addition, it is an efficient tool to rate user behavior from online users (Michael, John and Joseph (2010). As recommended by Chien & George (1999), this system can also help to promote desired sites to operators.

2. Content-based recommender system is a recommendation system that works on the basis of matching items with similar attributes (Balabanovic and shoham, 1997; Deepa and Govind, 2016). In this approach, a user profile is also applied, attributed with items highly appreciated by the user (Mooney & Roy, 2000). For matching of items to be possible, information must be textually extracted from the items (Pazzani, 1999).

3. Demographic-based recommender system is a system that aims to categorize the users on the basis of personal attributes and makes interactive dialogue (Burke, 2002; Priyanka & Vijendra, 2016). The user‘s responses are matched against a library of manually assembled user stereotypes. Some more recent recommender systems have also taken up this approaches, and used

demographic groups from marketing research to suggest a range of products and services (Krulwich, 1997; Laila & Akram, 2013).

4. Utility-based recommender system is a system that makes suggestions based on a computation of the utility of each object for the user (Burke, 2002; Scholz, Dorner, Franz & Hinz, 2015). Of course, the central problem is how to create a utility function for each user (Alan, 2013). For example, Tête-à-Tête and the e-commerce site, PersonaLogic, each have different techniques for arriving at a user-specific utility function and for applying it to the objects under consideration.

5. Knowledge-based recommender system attempts to suggest objects that are based on inferences about a user‘s needs and preferences (Burke, 2002; Jacek, 2013). In the simplest case, as in Google, it may simply be the query that the user has formulated. In other cases, it may be a more detailed representation of the users‘ needs (Towle & Quinn, 2000, Chen & Feng, 2013). The entry system and several other recent systems, for example, employ techniques from case-based reasoning for knowledge-based recommendation (Schmitt & Bergmann, 1999; Debashis, Laxman & Sujoy, 2017).

Consequently, the collaborative-based recommender system is proposed as the effective recommender system in this research. Its capabilities and advantages are highlighted by the Chien and George (1999), Burke, Mobasher, Bhumik and Williams (2005), and Michael, John and Joseph (2010), Logesh and Subramaniyaswamy (2016) as emphasized in the above discussions, in comparison to the other four types of system.

1.6 Problem Statement

The Malaysian homestay programmes do not seem to gain the economic impact brought by the tourism industry. This disconnectivity is partly due to ineffective communication gap between HP owners and potential visitors/users: while potential visitors are turning away from traditional medium (Wakaba, 2011), HP owner are ill-prepared to adapt to the new medium. Potential visitors or consumers are turning away from the traditional sources of advertising, such as radio, television, magazines and newspapers (Wakaba, 2011). Consumers also consistently demanding more control over their media consumption. They require on-demand and immediate access to information at their own convenience (Vollmer & Precourt, 2008). This can be done through the internet leading to websites. Promotion-related role of social media is important and unique (Reuber & Fischer 2010). Customers or users can use it to communicate with one another. However, the current website for the Malaysian HPs is static and not much useful information is available. On top of that, there is no centralized portal or website available for the Malaysian HPs. Furthermore, there is no specific website also for each HP, with exception of a few. Hence, a good and effective website is much needed as it can give more meaningful information regarding the HPs to tourists. In order to overcome all these issues a Collaborative Based Web Recommender (CBWR) website is needed.

As a result a CBWR system is proposed in this study. The CBWR system is a type of content management system (CMS) in the form of a website. It works on the basis of matching visitor likings with corresponding attributes (Terven & Hill, 2001). The CBWR is more flexible (Lina, Smith & Yunis, 2003) and could even do matching with authentication. The CBWR system can generate a better recommendation

through product variety if compared to the demographic-based recommender system which is intended to provide a variety of products and services only (Park, Saem & Cho, 2015). Furthermore, it can also recommend products or services that are based on user utility. This user utility is such as behavior of online visitors for specific website. Hence, this research intends to utilize the collaborative-based recommender system to get out of drawbacks and reach expected goals. The basis of the recommendation itself is on making comparison and matching dissimilar user profiles as suggested by Long, Xu, Liao and Chen (2014).

The present research provides improvement to the recommender system by the help of user view (Burk, 2002) and CiteUlike functions. As shown by studies done under the collaborative-based recommender system, a model, such as a machine learning model or a probabilistic model normally collects users‘ information based on the highest user ratings, and that model is applied to foretell ratings of items (Cheng et al., 2003; Yin, Zhimin, Xiang & Zhang, 2014). Subsequently, the Google Sites is an easy accessible portal potential for use related to homestay tourism in Malaysia. Hence, the proposed CBWR system adapts the collaborative filtering (CF) which could exclude the inadequate features and problems related to over-specialization regarding the CF technique.

1.7 Research Questions

Based on the above problem statement, this study attempts to answer the following questions:

1.7.1 What are the attributes of a HP, requirements of CBWR system and criteria for an effective website to develop an effective collaborative based web recommender website?

1.7.2 How can a collaborative based web recommender website for homestay programmes be developed?

1.7.3 How can the collaborative based web recommender website be validated and evaluated?

1.8 Research Objectives

The main objective of this research is to develop a content management system to promote the HPs globally, such as a collaborative based web recommender (CBWR) system. To achieve this objective, certain specific sub-objectives are employed as follows:

1.8.1 To categorize the HP attributes the requirements of CBWR system and criteria for an effective website for the development of the proposed collaborative based web recommender homestay website.

1.8.2 To develop the collaborative based web recommender homestay website that will support the business initiative of the HPs in the community network.

1.8.3 To validate and evaluate the collaborative based web recommender system‘s performance in the homestay programme initiative.

1.9 Scope of the Study

The scope of study covers the Northern Corridor Economic Region (NCER). There is a total of 26 homestay programme in the NCER. In this research, the privately owned homestays are not considered as they are not community-based. Hence, throughout the thesis, the term homestay is referred to the HP. Out the 26 HPs, the reseacher collected data from seven HPs in Kedah and Perlis, the northern state of Malaysia in NCER. The researcher examined the limitations of NCER portal and identified the challenges to help Northern Corridor Implementation Authority (NCIA) to expand the existing tourism economic sector by transforming the promotional effort to increase the demand of contemporary business initiatives. A drastic effort is needed to transform NCER for mutual benefit. It is felt that the proposed CBWR website could play a subtle role; as an agent of change that hopefully will bring a remarkable return in the tourism industry, especially the CBT.

Hence, developing the CBWR homestay website focusing on various important aspects of the HP in the NCER is the scope of this research. The proposed website could be linked to the main NCER portal as an added value which will be a huge potential for economic growth through the untapped wonders of rural and cultural attractions.

1.10 Research Significance

The significance of the research can be described as below. Brief descriptions are presented here in this section, while the details are expressed in section 6.2 in the final chapter.

1.10.1 To the Body of Knowledge

Mainly, the research contributes a new information or knowledge to improve the HP business initiative through the establishment of a unique recommender system, that is the CBWR system. It can deliver user-exact information in real time on user environment. This contribution is in the methodological aspect, where a collaborative-based approach is introduced in the CBT case.

1.10.2 To the Potential Tourists

Malaysia can be promoted as an attractive destination for homestay tourists. Tourists can find the right location according to their budget or any specific location, and the CBWR system can provide the best choice for the user by utilizing specific applications, such as electronic maps and recent top used page. Moreover, users or potential visitors can also make numerous selections from the recommender website.

1.10.3 To the Policymakers

The output of this research can help Tourism Malaysia to promote HPs in Malaysia globally, precisely for the NCER. It can help the government to revive culture in the rural areas cheaply. The homestay website does not only solve the existing problems faced by the homestay operators in Malaysia but it can also be used for other applications such as benchmarking proposed.

1.10.4 To the Rural Communities

The CBWR website promotes the rural homestay business initiative highlighting the signature products and services. The rural communities are able to improve their

livelihood through technology-based promotion strategy; this could also improve their ICT knowledge.

1.11 Outline of the Thesis

Overall, this thesis consists six chapters, which chapter one introduced background of homestay programmes in Malaysia. The discussion leads to the construction of the problem statement and description of the objectives that need to be achieved in this research.

Chapter two presents the homestay programme issues for promotion and marketing. It briefly explained the literature related to promotion and marketing. Also, it introduced the new contemporary technology-based promotion strategies.

Chapter three further explained the homestay promotion such as the recommender system. The discussion focused on the modern recommender technology and background of each type of the recommender system.

In chapter four, we present the methodology of how to construct the recommender model then develop a collaborative based web recommender (CBWR) system. This chapter is divided into two parts. The first part is on how to build a website for homestay programmes in the NCER. The second part is on the integration of CBWR system with selected homestay websites.

In chapter five, the CBWR system is presented as the output of this research, where it is able to provide the rating and ranking of the HPs based on the frequency of the

website being accessed. Thus, the CBWR website can be considered as a new recommender and an effective promotional tool for the Malaysian HPs.

Chapter six provides the summary and contributions of the CBWR website. Some limitations are discussed with suggestions for future work.

CHAPTER TWO

MARKETING AND PROMOTION OF HOMESTAY

Homestay plays a significant role in the development of tourism in Malaysia. The HP can enhance the growth of the economy if marketing of the HP is done using technology. Homestay operations could be easier by introducing technology for homestay promotion. However, HP operators face a lack of knowledge on technology and systematic management. This chapter attempts to review some of the earlier works that have been done. These earlier works are in relation to the objectives to innovate a technological application to promote rural homestay, which fall under service marketing of a type of tourism product.

2.1 Service Marketing

Service marketing is a particular subdivision of marketing (Sanjeev & Mishra, 2014). Service marketing focuses on the advertising of financial activities obtainable business to clients (Lovelock & Wirtz, 2006). It might include the process of giving service such as telecommunications, health treatment, financial, hospitality, car rental, air travel, and professional services (Lovelock & Gummesson, 2004). A HP provides unique hospitality and services in the non-urban areas, thus being considered as a CBT initiative. Therefore, specific effort on tourism marketing is important to boost the industry.

2.2 Tourism Marketing

Tourism marketing is the commercial discipline related to tourists being fascinated to a specific place (Monika, 2012; Obed, 2017). It is based on the approach of

thematic fields (Monika, 2012). There are various types of tourism marketing approaches that exist nowadays such as e-marketing, brochure, leaflet and other conventional marketing approaches. Among these approaches, e-marketing has become the most favorable to tourism operators (Brodie et al. 2007). E-marketing is fast emerging as it involves the usage of the internet and other interactive technologies aiming to have communications between the company or provider and consumers (Coviello et al. 2001). Hence, tourism marketing with the support of technologies is influential and potential to increase the number of tourists and the revenues for CBT in Malaysia.

2.3 Homestay Promotion

Homestay promotion is an important part of tourism marketing and it is defined as advertising through electronic and mass media (Stock 2000). However, there are many ways to promote homestay tourism through advertising.

For the actual opening of a homestay, promotions in brochures, leaflets and travel magazines are generally used. Modern civilization has made websites and the Internet a major medium for promoting homestay. Studies conducted by Balasubramaniyan (2010) and Baeza-Yates, Castillo and López (2005) show that a social network can be used for homestay promotion, such as Facebook and Twitter. Loban (1997) also agrees that computer-assisted travel counseling (CATC) is one of the promotion tools for tourist counseling. Technology can play a big part in promoting homestay if correctly used. However, conventional promotion strategies are briefly discussed in the following subsections.

2.3.1 Brochures and Leaflets

The brochure is a combination of spatial pictures in a paper format (Houts, Doak, Doak & Loscalzo, 2006). Although brochures and leaflets are extremely instructive, their main purpose is persuasive (Gotti, 2006). Brochures are among the most used and respected sources for promoting and marketing tourism as well as for homestay initiatives. Studies by Becken & Gnoth (2004), Beerli & Martin (2004), Crompton (1979), Etzel & Wahlers (1985) and Goodall (1990) all agree that brochure contents and descriptions about the residence and homes can attract tourists (Víctor & Antonio, 2011). However, marketing through brochures and leaflets are lack of visualization to users, which the visualization can be enhanced through internet-based marketing.

2.3.2 Travel Magazine

Travel magazines carry information about a travel destination (Goossens, 2000). Travel magazines are intended to be a tourist destination advertising medium in a paper format and potential visitors can enjoy and get excited by reading travel magazines (Bierzynski, 2011). Travel magazines are one of the mechanisms to broadcast the tourism sector (Hsu & Song, 2012). Nowadays, travel magazines can promote tourism through attractive pictures and more lengthy articles but it is still not possible to access all tourists around the world (Amin & Ibrahim, 2016). Hence, the role of travel magazines is limited, as it cannot reach all potential local and foreign tourists. For a more global reach, technology adaptation is crucial.

2.4 Homestay Promotion and Technology Use

In the 21th century, people are using Facebook, blogs and Twitter for promoting products. Tourism products, such as homestay initiatives, can really benefit from such

technology. A study conducted by Isa (2010) shows that a blog is a significant medium to promote and gather operator‘s views. Parsons, Shiffman, Darling, Spillman and Wright (2014) say that Twitter is an additional promotion tool which provides an extra comprehensive and rational devaluing of construction through concentrating of ICT. Whereby the success of homestay business initiatives is based on Internet utilize chains (Werthner & Klein, 1999). However, all the information gathered from various resources as mentioned above is not enough for a tourist or traveler to select and book a homestay destination. That is why a recommender system is important to attract tourists by providing information on specific locations with specific promotions.

2.4.1 Facebook

Facebook is one of the foremost social-interactive media, with millions of users therefore, marketing via social media has been studied extensively, particularly in promoting homestay via Facebook (Itoga & Lin, 2013; Admic et al., 2002). In addition, homestay promoters used Facebook for their advertising and announcements (Barnes & Coatney, 2014). Thus, Facebook is an alternative social network to improve tourism including HPs (Van Grove, 2010). Although Facebook is popular among the younger generation, it however cannot provide specific promotion to all tourists around the world.

2.4.2 Blog

A blog (a blend of the term ―web log ―) is recognized as a type of website. Xiang and Gretzel (2010) said that it is one of the social media, slowly becoming an important medium for tourists. According to Lin and Lin (2009) and Fahada and Rahman

(2017), the advertising procedure in blogs is being affected by changes to travel and homestay. Social networking features, such as blogging would be compulsory in the website for homestay operators to attract users and potential travellers (Hiang, 2008; Zhang & Hitchcock, 2017).

2.4.3 Twitter

Twitter is a micro-blogging facility used by tourists and operators and is fast becoming popular (Kwak, Lee, Park & Moon, 2010). For example, an online user guide for tourists in Greece has been developed using Twitter as a promotion tool for homestay tourism (Papadopoulos & Dionysopoulou, 2015). Twitter is considered as an interpersonal communication tool to encourage live interactions among the users and homestay tourists (Demirtas, 2012). But Twitter is only popular for some societies. It is not appropriate to promote to all local and foreign tourists.

2.5 Traditional Homestay Promotion

Traditional homestay promotion is an effort on how a homestay business was run in the earlier days (Mapjabil & Ismail, 2012). Potential tourists are required to go through travel agents and they will prepare the accommodation and suggestions of available activities for incoming tourists (Werthner & Klein, 1999) as exhibited in Fig 2.1.

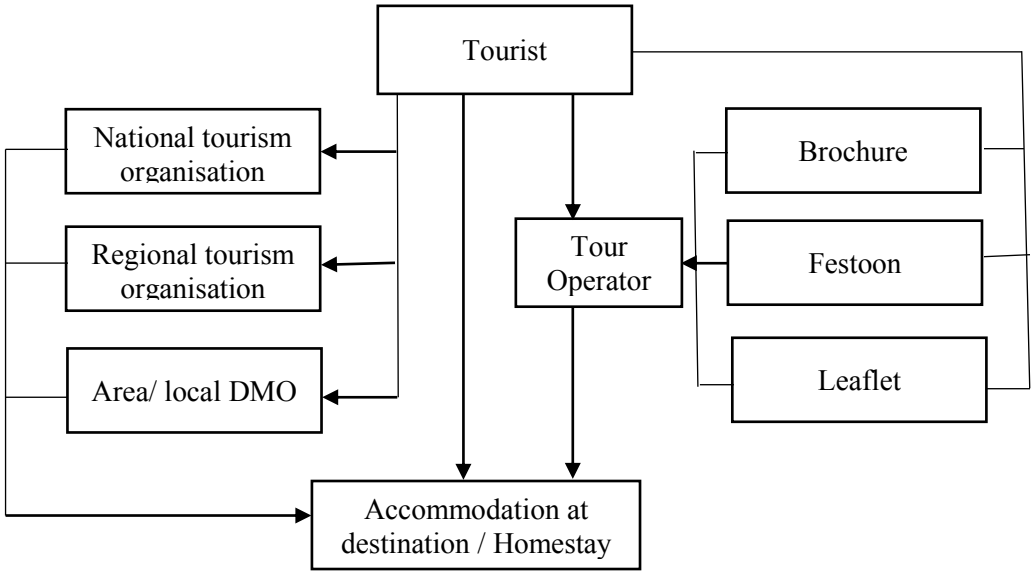

Figure 2.1. Traditional promotional activities for Homestay business initiatives.

Source: (Werthner & Klein, 1999)

2.6 Technology-based Homestay Promotion

Internet-based homestay promotion is a technology that shows homestay upgrades and advertising on Internet protocol (Garzotto et al., 2004). A homestay initiative model is a portrait of homestay promotion. It shows how Internet works to promote it (Werthner and Klein, 1999). Previously, the system does not help users to give opinions on their choices. Hence, a web recommender system can help users to view and recommend homestay destination sites (Shani & Gunawardana, 2011). A web recommender system is a significant tool for collecting, storing and promoting information. Furthermore, this system also provides prediction and verdict models for product promotion (Littlestone & Warmuth, 1994). However, many homestay recommender systems and techniques have been replicated. Recommender systems can now be found in many applications (Herlocker et al., 2002; Logesh & Subramaniyaswamy, 2016). Such systems classically provide recommended items they strongly favor, or forecast how much they might prefer an item (Das et al.,

2007). These systems help operators promote appropriate items, and ease the task of finding and choosing items in the assortment (Das et al., 2007). Many variables are involved in the homestay model as mentioned in Figure 2.2.

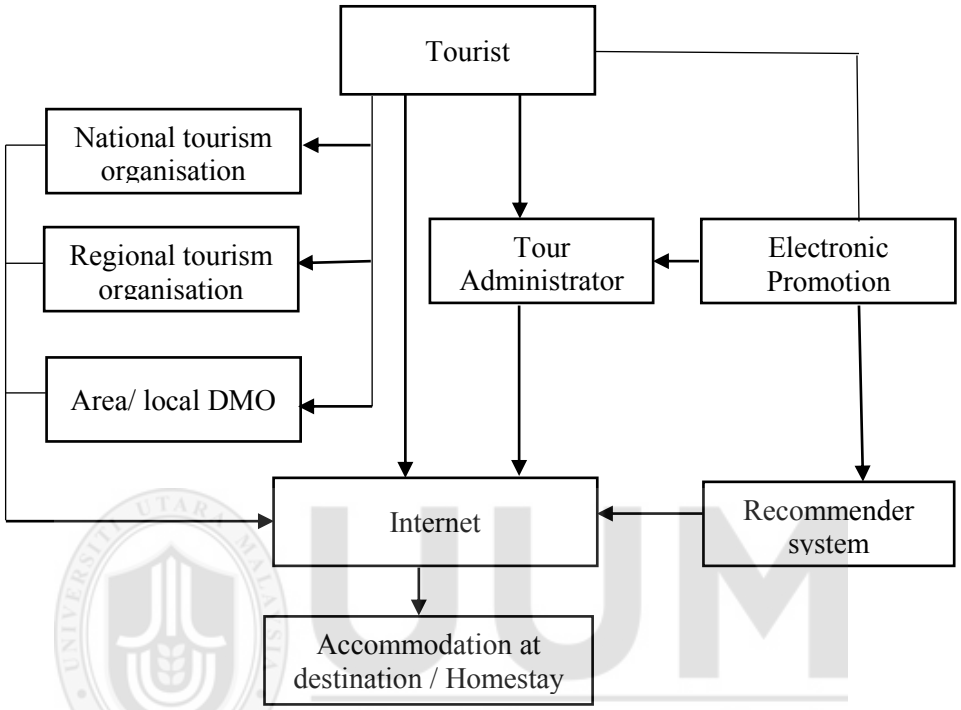

Figure 2.2. Suggested promotional activities for homestay business initiatives.

Source: (Werthner & Klein, 1999)

2.7 Summary

In this study, the objective is to figure out the design criteria for the recommender system. Besides that, the foremost aim of the study is to implement the ICT in recommender system to enhance the promotion of homestay program. The promotion method is a commercial application. Therefore, developing a more advanced technological tool via the Internet and electronic media is needed.

CHAPTER THREE

REQUIREMENTS AND RECOMMENDER SYSTEM

3.1 Introduction

The recommender system is a system that can support the business initiatives of the HP in the social network. However, the impact of technology adoption increases the performance and income of the HP. The web recommender system can recommend websites and have a slightly different goal from other systems as it provides more meaningful information in many applications (Burke, 2000). It is not essential to predict every complete entry in a collaborative recommender. Rather, it is only necessary to discover some entries in each row that are probably high (Cohen-Schapire & Singer, 1999). Hence this chapter discussed certain recommendations for the technology-based HP promotion effort, such as the recommender system.

3.2 Website for Homestay

A website is one of the media to promote homestay (Yu, 2012). Furthermore, the marketing of homestay through website has become popular and effective for tourism (Jain, Wangchuk & Jackson, 2003). The Google Sites are one of the websites that are user friendly with a chance to collaborate with the web recommender (Linden, Smith, & York, 2003). A homestay website can be created using Google Sites. For every site, the homestay owner is the administrator. Google search provides recommendations to access these sites over the web to users around the world (Terveen & Hill, 2001). The administrator can update price lists according to their seasons.

3.2.1 Attributes of Website

A website consists of many attributes. These attributes are included in the sites. As for homestay websites, its attributes generally include _homepage‘, _about us‘, _contact us‘, _current promotion‘, _facilities and unique products‘, _history‘ and _location map‘.

3.2.2 Site Map

A diagram that demonstrates the process of the production of data set is called tree diagram (Johnson, 1967). The principal characteristic of a website tree diagram is homepage. Travelers will search for information through search engines (Chaffey, 2014; Jennifer, 2002). In the website, the interaction page is an important element for verification; the contact page helps tourists to communicate with the website owner or people who are responsible for the upkeep of the site. History and society give background information of the homestay. Besides that, other attributes are also important in a homestay website, such as facilities, promotions, events, cost and unique products. The suggested structures of website attributes are shown in Figure 3.1.

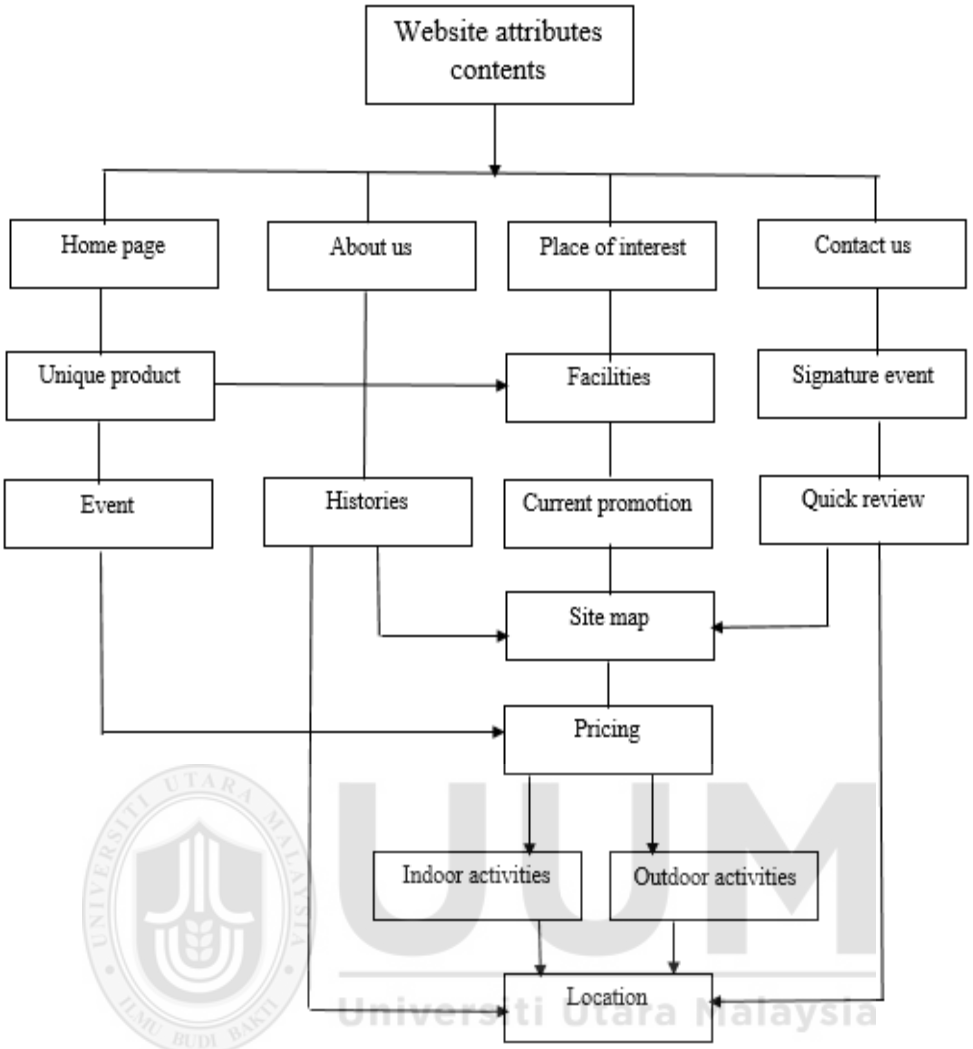

Figure 3.1. Attributes of website

Source: (Johnson, 1967)

Table 3.1

Examples of the attributes and content of a homestay website

URL Address	Homestay attributes and content
https://www.homestay.com/united-kingdom/ashford/24039-homestay-in-ashford-ashford	Homestay title: A Home Away from Home, UK The Homestay website attributes are Homestay, Photos and Rooms, Location and Meals, Rules and Reviews. Distinguished homestay products: Tennis, Running, Fitness, Gym, Gardening, Reading.
https://www.homestay.com/united-kingdom/london/4980-homestay-in-london	Homestay title: Lively Family in Stratford, London, UK. The homestay website attributes are Homestay, Photos and Rooms, Location, Meals, Rules and Reviews. Distinguished homestay products: Cooking, Diet and Nutrition, Dancing, Television.
https://www.homestay.com/united-kingdom/birmingham/72083-homestay-in-great-barr-hamstead-birmingham	Homestay title: Family Home close to city, UK. The homestay website attributes are Homestay, Photos and Rooms, Location, Meals, Rules and Reviews. Distinguished homestay products: Cooking, Riding motorbikes, Gardening, Camping, Music, Gigs, Festivals.
https://www.homestay.com/united-kingdom/bournemouth/117874-homestay-in-muscliffe-bournemouth	Homestay title: House of fun, UK. The homestay website attributes are Homestay, Photos and Rooms, Location, Meals, Rules and Reviews. Distinguished homestay products: Cycling, Horse riding, Fitness, Gym, Cooking, Diet and Nutrition.
https://www.homestay.com/united-states/los-angeles/74550-homestay-in-west-la-los-angeles	Homestay title: Great LA Westside location, Cozy rm, USA The homestay website attributes are Homestay, Photos and Rooms, Location, Meals, Rules and Reviews. Distinguished homestay products: Tennis, Sailing, Fitness, Gym, Cooking, Hill walking.

Table 3.1 *Continued*

https://www.homestay.com/united-states/san-francisco/77746-homestay-in-richmond-district-san-francisco	Homestay title: Beautiful Edwardian Victorian, USA. The homestay website attributes are Homestay, Photos and Rooms, Location, Meals, Rules and Reviews. Distinguished homestay products: Cycling, Swimming, Skiing, Mountain climbing, Mountain biking.
https://www.homestay.com/united-states/daly-city/25238-homestay-in-visitacion-valley-daly-city	Home title: Fun, outgoing family in city Centre, USA. The homestay website attributes are Homestay, Photos and Rooms, Location, Meals, Rules and Reviews. Distinguished homestay products: Tennis, Computer games, Reading.
https://www.homestay.com/germany/berlin/26302-homestay-in-prenzlauerberg-berlin	Homestay title: Castle in Prenzlauer Berg, Germany. The homestay website attributes are Homestay, Photos, Meals, Rules Disti nguished homestay products, Swimming, Gymnastics, Fitness, Gym.
https://www.homestay.com/germany/olching/103279-homestay-in-ruhigem-viertel-nahe-an-s-bahn-und-ortszentrum-olching	Homestay title: Hearty home with privacy. Germany. The homestay website attributes are Homestay, Photos and Rooms, Location, Meals, Rules and Reviews. Distinguished homestay products: Cycling, Swimming, Gymnastics, Fitness, Gym, Dancing.

3.3 Web Recommender System

The web recommender system is a recommender tool that recommends specific sites to the users through recommendation, and its recommendation is subject to the user and operator (Terveen & Hill, 2001; Wu, Alvino, Smola, and Basilico, 2016). Recommender systems are comprehensive and comprise improving the understanding of operators, including background material and backup multi-criteria ratings. It is a

more flexible and less invasive type of recommendation (Linden, Smith & York, 2003; Diao, Qiu, Wu, Smola, Jiang & Wang, 2014). Such inclusive mockups of recommender systems can deliver improved recommendation capabilities (Schafer, Konstan & Reidl, 1999). Figure 3.2 below gives a clear view for a recommender. In this recommender, group of users and locations are used. Then the similarities among the users are found, followed by user-based prediction. Then, the recommender gives a specific recommendation for a new user to find the accepted product.

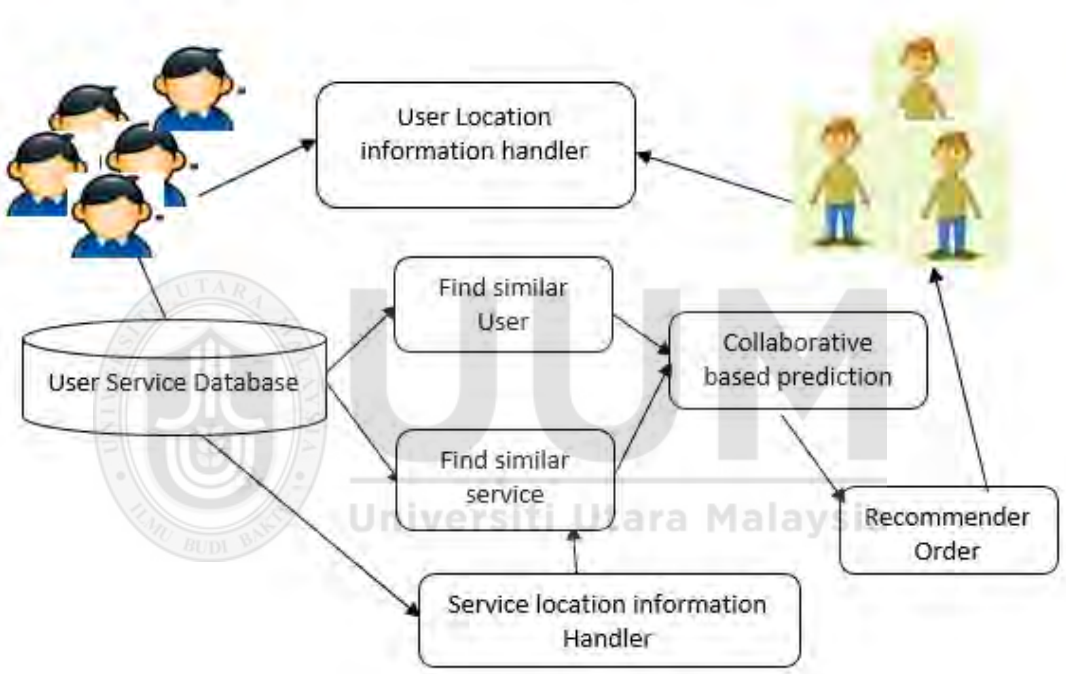

Figure 3.2. Web Recommender process by online user behavior
Source: (Jonathan, 2016)

3.4 Categorization of Recommender Systems

Burke (2002) categorised recommender systems into five main categories: collaborative-based recommender (Chien & George, 1999); content-based recommender (Balabanovic & shoham, 1997); demographic-based recommender (Rich, 1979); utility-based recommender (Guttman, 1998), and knowledge-based

recommender (Schmitt & Bergmann, 1999). A summary of the categorization and descriptions is presented in table 3.2.

Table 3.2

Categorisation of recommender systems

Recommender System	**Authors**	**Characteristics**
Collaborative-based recommender website	Chen & Sycara (1997), Michael, John and Joseph (2010), Burke, Mobasher, Bhumik & Williams (2005), Ahmadi-Abkenari, and Selmat (2012).	❖ Recommendations to a user based on the similarities and dissimilarities between this user and other users. ❖ Share similar preferences with the given user and recommends articles they like to that user. ❖ Gustos, GroupLens, FireFly and Jester are all examples of collaborative recommender systems. ❖ Similar choices with the given user and recommends
Content based Content based recommender system	Balabanovic and Shoham (1997), Mooney & Roy (2000), Pazzani (1999), Mooney and Nagarajan (2002).	❖ Acknowledge the content of user behavior from online. ❖ Generally, a user's profile is constructed by analyzing and extracting useful information form user behavior. ❖ Stores the features of articles in databases and responds to users ❖ Features from the content of the articles that the user has rated.
Demographic based recommender system	Rich (1997), Pazzani (1999), Burke (2002).	❖ It is based on demographic location. ❖ Execute specific population behaviour ❖ Different scale for different organisations and country.

Table 3.2 *Continued*

Utility based recommender system	Guttman (1998), Burke (2002, 2004), .	❖ Multi-Attribute Utility Theory ❖ Utility-based methods are able to outperform the traditional VSM method ❖ Evaluates on the basis of two or more criteria ❖ Recommend items with highest utilities based on this function
Knowledge based recommender system	Schmitt and Bergmann (1999), Burke (2002), Towle and Quinn (2000).	❖ Engage user profiles and appropriate filtering techniques to assist users in finding more relevant information over the large volume of information ❖ Execute data based on user profiles ❖ Content features include keywords, phrases, category names or other textual content embedded as meta-information ❖ Domain ontology represents the knowledge contained

3.4.1 Collaborative-based Web Recommender System

The collaborative-based web recommender (CBWR) system is a recommender system based on the user's behavior (Michael, John & Joseph, 2010). The CBWR system finds similarities among online users (Chien & George, 1999). In order to do that, there must be a profile record for every operator and the recommendation itself is then built by associating it with similar and different operator profiles (Burke, Mobasher, Bhumik & Williams, 2005). But another study shows that users with unusual tastes might suffer from a comparatively empty dataset with no match at all (Bhumik, Williams, Mohasher & Burke, 2006). Fortunately, the weakness can be improved over

time with this approach. CBWR systems might also discover cross-genre niches in additional algorithm (Williams, Mobasher, Burke, Bhumik & Sandving, 2006).

3.4.2 Content-based Recommender System

Balabanovic & Shoham (1997) stated that a recommender system matches user demand items with similar characteristics of a product. In this approach, an operator outline is also applied, accredited with items that are highly appreciated by the operator (Mooney & Roy, 2000). For the matching of items to happen, information must be textually extracted from the characteristics of a product Hence, this type of recommendation is the most suitable for text-based documents (like music, images and videos) (Pazzani, 1999). Furthermore, one of the benefits of content-based recommendation is that it progresses over time; the quality of the recommendation improves with the amount of storage data, and the information finder is a system that employs content-based recommender (Melville, Mooney & Nagarajan, 2002).

3.4.3 Demographic-based Recommender System

Demographic recommender is a method that aims to classify the user and operators on the basis of personal characteristics. The user information in library storage is integrated with a classifying tool to identify the user‘s location and their behavior on specific website (Pazzani, 1999). Therefore, the representation of demographic information about user model varies greatly. However, this system also extracts and makes a similar interest list to identify the equal interest of same location for instance Asia, Europe and America (Rich, 1979). Above techniques form similar ―people-to-people‖ connections but use dissimilar data. Advantage of the method is that it may not necessitate an operator‘s evaluation (Burke, 2002).

3.4.4 Utility-based Web Recommender System

Utility-based recommender system is a method based on the user to utilize a specific website or task (Burke, 2002). The system works vendor dependability and produce accessibility to make it considerable and to trade off value in contradiction of delivery agenda for an operator who is looking for the information (Burke, 2002; Guttman, 1998).

3.4.5 Knowledge-based Recommender System

The recommender system works based on user requirements and predilections (Burke, 2002). In other words, it is the illustration of users‘ needs (Towle and Quinn, 2000). This method works through a knowledge-based dataset (Schmitt & Bergmann, 1999). Another kind of knowledge-base is known as ―Editor‘s choice.

3.5 Criteria for Recommender System

Words are condensed by removing prefixes and suffixes to discover the desired information and this is recognized as criteria for any recommender system (Porter, 2001). Tourists select homestay based on certain criteria which are: religious places, monuments, shopping places, guides, traditional scenery, arts, galleries, cultural villages, theme parks, tour packages, historic people, indoor facilities, architecture and historic buildings (Su and Huh, 2002; Huh 2002). These are types of attraction that are normally offered by some homestays. For example, WebMate is an individual mediator that helps operators browses the web; it uses to uphold numerous outline courses that each signifies a dissimilar subject (Chen, Sycara, 1997). In the second method, documents are recommended if their notch is above a relevance verge (Yan, Molina, 1994). Furthermore, the signature product or product attributes is detected by

the recommender system of similar interest and provide recommendation for user‘s (Busby & Rendle, 1999). Amazon.com, for instance uses the GroupLens system for various recommendations about books and videos and it is also a mining technique for personalization to find reliable data for tourist interest (Mobasher et al., 2002; Resnick et al., 1994). Subsequently, table 3.3 presents a summary of criteria for a good and effective website.

Table 3.3

The criteria of developing a good and effective website

Author	**Topic**	**Criteria of developing a good and effective websites**
Sakal (2010)	GUI vs. WUI Through the Prism of Characteristics and Postures.	Graphics users interface
Baca and Cassidy (1999)	Intranet development and design that works. Human Factors and Ergonomics Society Annual Meeting Proceedings, 777-790.	Intranet development and design.
Williams (2000)	Guidelines for designing and evaluating the display of information on the Web. *Technical Communication*, 47(3), 383-396.	Design and Evaluate information from web.
Keeney (1999)	The value of Internet commerce to the customer", Management Science, vol. 45, no. 4, pp. 533-542.	Value of Internet commerce to the customer.
Junhong (2009)	Would you shop online for groceries?	Online promotion.
Hofacker (2001)	Internet Marketing, 3rd ed., Wiley, New York.	Internet marketing.
Yu and Wu (2007)	Determinants of Internet shopping behavior: An application of reasoned behaviour theory", International Journal of Management, vol. 24, no. 4, pp. 744-762, 823.	Internet shopping behaviour
Rox (2007)	Top reasons people shop online may surprise you	Online customer perception

3.6 Discussions and Summary

Certain types of recommender systems were done and have been developed for different purposes. In spite of all developments cohort systems, the recommender system needs more developmental approaches. Furthermore, the recommender system is the only suitable tool to advance promotion and marketing. Therefore, development of a more modern recommender technology through the CBWR system is needed.

Based on our reviews on its capabilities, we chose the collaborative based recommender system in our research. One of its capabilities is that it works based on users from online and collaborate among users. In addition, it personalizes a user‘s preference from the online behavior. Hence, the methodology on developing that recommender system is described in the next chapter.

CHAPTER FOUR

RESEARCH METHODOLOGY

In this chapter four, all research objectives are attended to and described relevant to methodologies on how to go about achieving them. The main objective is to develop a content management system, which specifically is the CBWR website for promoting the HP business initiatives. Therefore, the methodologies are explained in such a way that the main objective and other sub objectives are being achieved. These cover research design, research framework, research process, development of the CBWR website and its validation and evaluation.

4.1 Research Design

The aim of this research is to develop a CBWR system for HPs. This research combines qualitative and quantitative approaches. The data required in this research is the criteria for developing good and effective homestay website, homestay signature products, characteristics of homestay recommender website and lastly the users‘ data. For these purposes, secondary data were collected by reviewing the literature. Besides, the data was also collected by reviewing several homestay websites from globally, which are most reputed. For primary data, it was collected via participatory action research workshop conducted for the homestay operators in the NCER of Malaysia. All the primary and secondary data obtained were used to develop the CBWR system as a method for solving the issues of online web promotion. The users‘ data were collected through the homestay website which is useful for making recommendations to the next user.

4.2 Research Framework

The research framework shows the overall workflow of the CBWR system. As mentioned previously, CBWR system provides the rating and ranking for the homestay recommender website by counting the number of users who access each homestay website. The CBWR system is slightly different from other systems where it helps the user to recommend other products, such as homestay websites from different HPs. The research framework is as exhibited in Figure 4.1.

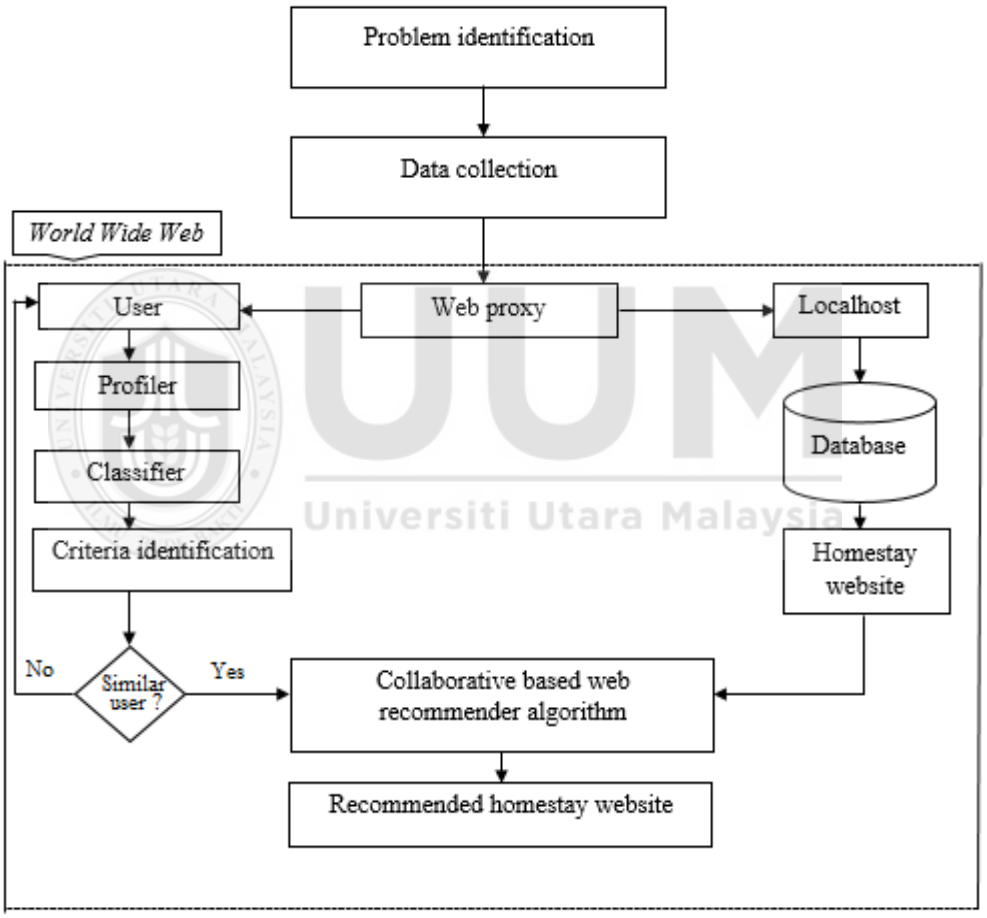

Figure 4.1. Research Framework for a CBWR System of homestay website

The research framework starts with problem identification. The problems faced by the homestay website users were determined. After that, the data on the criteria for an effective homestay website, HP signature products and characteristics of web recommender system were collected in order to build the CBWR system. Next, the

system starts when the user accesses the www. WWW is a platform for the web proxy. Web proxy helps the integration between homestay website and homestay recommender website. Then, it goes to localhost. From the localhost, the user‘s data is preserved in the database. Subsequently, users access the homestay website. At the same time, when a user is using the www, the profiler collects and records the user‘s data. Then, the classifier groups the users‘ data based on the website they have viewed. After that, the criteria of the users‘ online behavior are identified. When the criteria are identified, it creates the new list of homestay recommender website. Both operations are performed simultaneously in preparation for the CBWR algorithm to start its function. CBWR algorithm is then generated to recommend the best suitable homestay website.

4.3 Research Process

The elaboration of the components in the research framework is given in the research process as in Figure 4.2 and the following sub-sections.

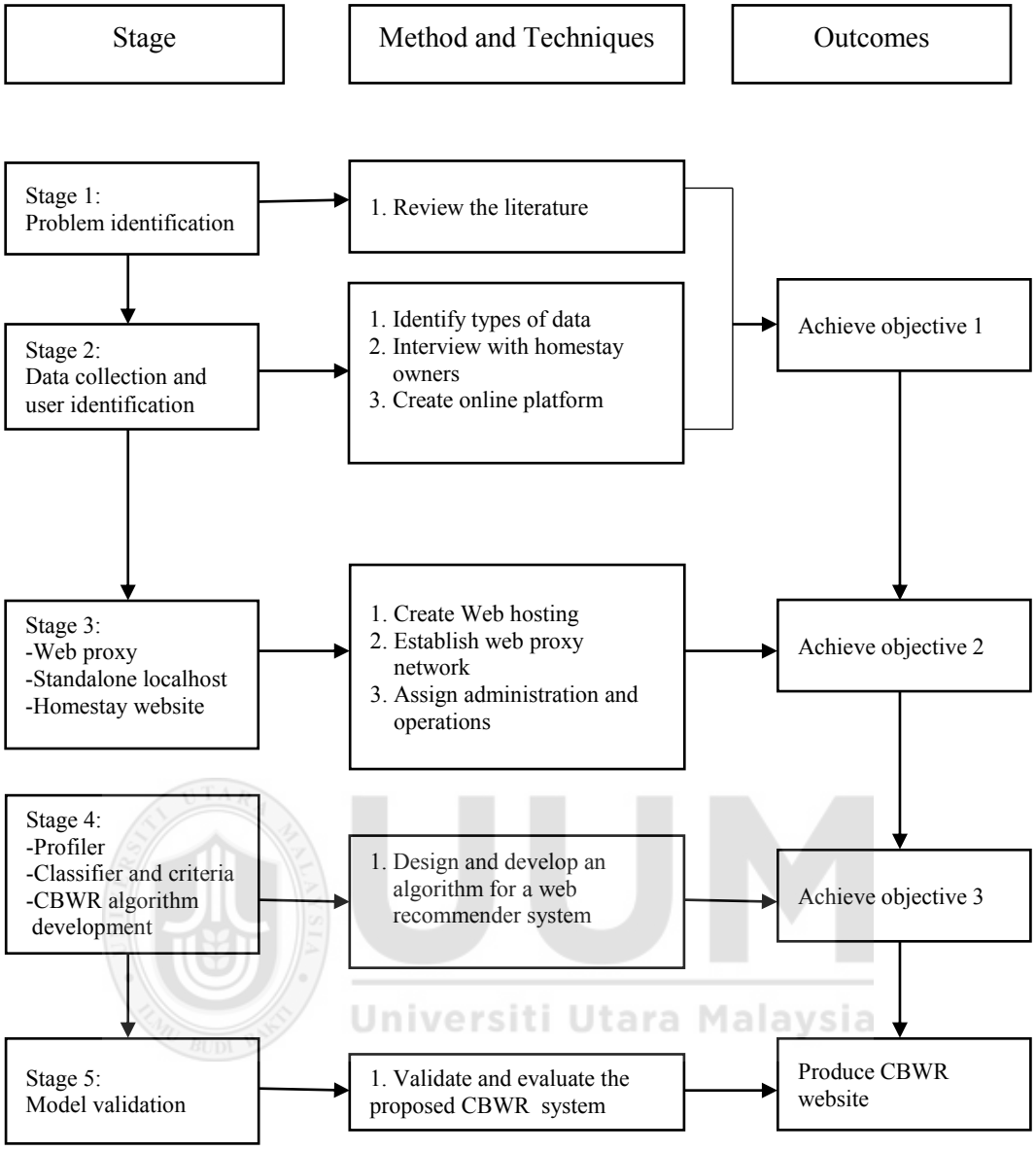

Figure 4.2. Research process of the CBWR homestay website

4.3.1 Problem Identification: Homestay Programme Website

Initially, a review on several relevant existing homestay websites was done as exhibited in table 3.1. The content analysis on their websites was done to identify the important attributes needed. Subsequently, further search on HP websites was done and several websites were found through the World Wide Web (WWW). Unfortunately, the existing HP websites for online promotion seems not really helpful

to the users. Firstly, the researcher noticed that the existing HP website does not have sufficient information. Furthermore, the current HPs have not used any advanced promoting tools, such as a web recommender. As a result, the current official HP website is unable to provide suitable recommendation of specific HP websites to users. In addition, the available homestay website is lacking in promoting the HPs for worldwide visitors. The need for an effective system is highly critical since it can shed some light to the homestay operators for better understanding of the usefulness of adopting technology as a marketing tool. Hence the problem studied in this research is how to develop a good and effective CBWR website. The more effective current promotion tool, such as the CBWR system, is not integrated with the homestay website. Therefore, a CBWR system is developed in this research to improve the HP websites as an effective promotion and marketing tool. For that purpose, the researcher suggests that the CBWR system is integrated with selected homestay websites to act as an effective promotional tool. The integration between CBWR system and the homestay websites can produce a more complete and effective website.

4.3.2 Data and Data Collection

This research involved two phases. Phase 1 was criteria identification for an effective homestay website; and phase 2 was the development of the CBWR website. Phase 1 involved two types of data: the criteria for developing an effective website; and criteria or characteristics of a recommender system or website. In Phase 2, the researcher utilized the criteria obtained in Phase 1 to develop the proposed CBWR website, in addition to other requirements necessary for the functionality of the website.

4.3.2.1 Phase 1: Data Types for Effective Homestay Website

This Phase 1 consists of two types of data. The first type of data is the criteria for developing a good and effective homestay website. The data was collected by reviewing past studies from journal articles, reports, proceedings and other existing websites.

The second type of data is on the requirements of a homestay recommender website. The data were collected by reviewing several homestay websites from abroad, such as Homestay & Farm Stay from United Kingdom (UK), Homestay website from Korea and homestay website from the United States of America (USA). This data became a reference and guide to build a good and effective homestay recommender website. Both sets of data are presented in Table 4.1

Table 4.1

Data types as input for an effective website

Data type	**Data**	**Foundation of data**
List of criteria for developing good homestay website	Elements for constructing Homestay website: • Windows outlook • Buttons • Homestay modules description.	Reviewing past studies from journal articles, reports, proceedings and other existing websites.
Characteristics of homestay recommender website	Data is based on several homestay websites from abroad: • Visual interface • Outlook • Production information layout • Attributes of the website.	Webpages available globally from different countries with Homestay & Farm Stay websites, such as the United Kingdom (UK), Korea and the United States of America (USA).

4.3.2.2 Phase 2: Data types for CBWR website

In this Phase 2, two types of data were collected. The first type of data was on attributes of HP collected through a participatory action research approach, where a workshop was organized to get participation from several homestay operators. All the 26 HPs operators were invited to the workshop, with each represented by two members from each HP. However, only seven representatives from the HPs attended. The participants were asked to describe and report all products and services from their respective HPs. The HP was determined based on a purposive sampling. Out of 156 HPs operated during the time this research was carried out, 26 HPs are located in the NCER region. The researcher identified homestay operators from 26 HPs in the NCER of Malaysia (Kedah, Perlis and Pulau Pinang) based on their willingness to participate. The homestay operators were asked to answer a set of open-ended questions and were involved the knowledge sharing about their HPs and its operations. From the descriptions and discussions with homestay operators during the workshop, the researcher collected all the related data about their homestay signature products and activities. The data obtained were then used to develop the homestay website for each operator.

The second type of data is the data related to users and the CBWR system. In order to complete the CBWR website, the researcher collected the requirements for the CBWR system. This data was collected after the development of the CBWR website was completed. When the CBWR website could be accessed by the users, the developed system records the users‘ data. The system counts the number of viewers for each homestay website, which can later be a reference for the next user. Both types of data are presented in Table 4.2.

Table 4.2

Data types as input in the CBWR website

Data type	Data	Source of data
Homestay signature products	Seven Homestay programmes from Kedah, Perlis and Pulau Pinang participated to share their homestay information: Such as: • Homestay activities • Homestay unique products.	Seven homestay operators from Northern Corridor Economic Region of Malaysia
Requirement for CBWR website	Data of users who access the CBWR system. These data are: • User ID • Number of users • Number of viewers for each homestay.	CBWR website

4.3.3 World Wide Web

The Internet is the global system of interconnected computer networks that use the Internet protocol (IP) suite to link billions of devices worldwide (Comer & Douglas, 2006). It is a network of networks that consists of millions of private, public, academic, business and government networks of local to global scope, linked by a broad array of electronic, wireless and optical networking technologies (Comer & Douglas, 2006). The World Wide Web (WWW) is an online hosting platform. WWW is called Internet by normal users. By using WWW, users are able to explore information worldwide. The WWW hold a unique IP address. In this research, the IP address used is visible as www.homestaykedah.com. This www web link is a unique website that provides users with information on HPs.

4.3.4 Web Proxy

A web proxy is a server (a computer system or an application) that acts as an intermediary for requests from clients seeking resources from other servers (Luotonen, 1994). A web proxy is a web page default browser. It allows users to browse the homestay website worldwide. Web proxy also helps homestay websites to integrate with the CBWR website.

4.3.5 Localhost

Localhost is an entrance point that connects with computers and network servers. It is used to access the network services that are running on the host via its loopback network interface (Huston & Michaelson, 2016). Using the loopback interface bypasses any local network interface from one computer to another computer. It is required by homestay websites as a standalone website page which helps to create an open source page for the CBWR system.

4.3.6 Database Design

Database is an organized collection of data (Taylor, 2008; Pinho & Costa, 2017*)*. It is the collection of schemas, tables, queries, reports, views and other objects (Liu & Özsu, 2009; Sun & Jafar, 2016). In this research, the data is organized to develop the data interface for homestay websites. It also supports the processing of information, such as modeling the availability of system space and website data bank. All the data about the homestay queries, promotion information, videos and images of various HPs (including for indoor and outdoor activities) were recorded in the homestay web recommender database. These unique activities are considered as the signature products of the HPs.

4.3.7 Homestay Website

In this research, the homestay websites can be accessed for its domain which is through www.homestaykedah.com. Homestay websites are the main welcome page that collaborates with the CBWR website. It contains homestay information, such as location, promotion and contact number. By logging-into the homestay website, users can access the CBWR website.

4.3.8 User

User is the person who uses the www link to get the information from the HP website. There are two types of operators: worldwide online users and homestay website operators.

4.3.9 Profiler

A profiler acts as a data collector to record users‘ background. Its function is to record the total number of new users from different browsers and operating systems that access the HP website. It also allows the identification of users‘ interest and to list the recent users through their top view of homestay web pages.

4.3.10 Classifier

The Classifier‘s function is to isolate the different interests of users and create a structured format into database in a row and column. This classifier classifies the users‘ data based on page viewed. Furthermore, the classifier categorizes users‘ interest based on their search behavior and likings from their hits of previous websites.

4.3.11 Homestay Attributes

Homestay attributes are the description of the homestay benchmarks, such as heritage site, village with traditional houses and sea-view which are recorded when a user accesses the website. The user tends to choose the website based on the homestay‘s special features. When the attributes match their interest, then the system marks the website to recommend it for the next user. In turn, the homestay attributes or features help users to find the desired and expected homestay website.

4.4 Development of the CBWR System

Firstly, the problems of current HPS were identified. Then, data was collected for developing the homestay website. In addition, the World Wide Web (WWW) and web proxy for Homestay website were developed. Furthermore, create local host and database for Homestay website was created as well as user, profiler and classifier for CBWR algorithm. The development of CBWR system involves several steps: constructing algorithm, system architecture, sequence diagram, flow chart of CBWR system and collaborative filtering (CF).

First of all, the researcher created the system for input user data followed by the platform to read and tabulate the data. Then, the frequency of the Homestay Website was assessed. Finally, system errors were identified. Lastly, the system created the CBWR website. In addition, it is provided in the display. The dashboard core connects to the CBWR website window.

The CBWR algorithm is a self-contained step by step set of operations to be performed in order to build the CBWR website. At this phase, the CBWR algorithm is

developed. All requirements for the algorithm are arranged to execute the CBWR algorithm process. The CBWR algorithm is user and item-based; so, each requirement for both phases is isolated. The researcher highlights the entire documentation in a flow chart to describe the algorithm and relevant processes as in Figure 4.3. The flow chart explains how the homestay recommender website is being recommended to the user.

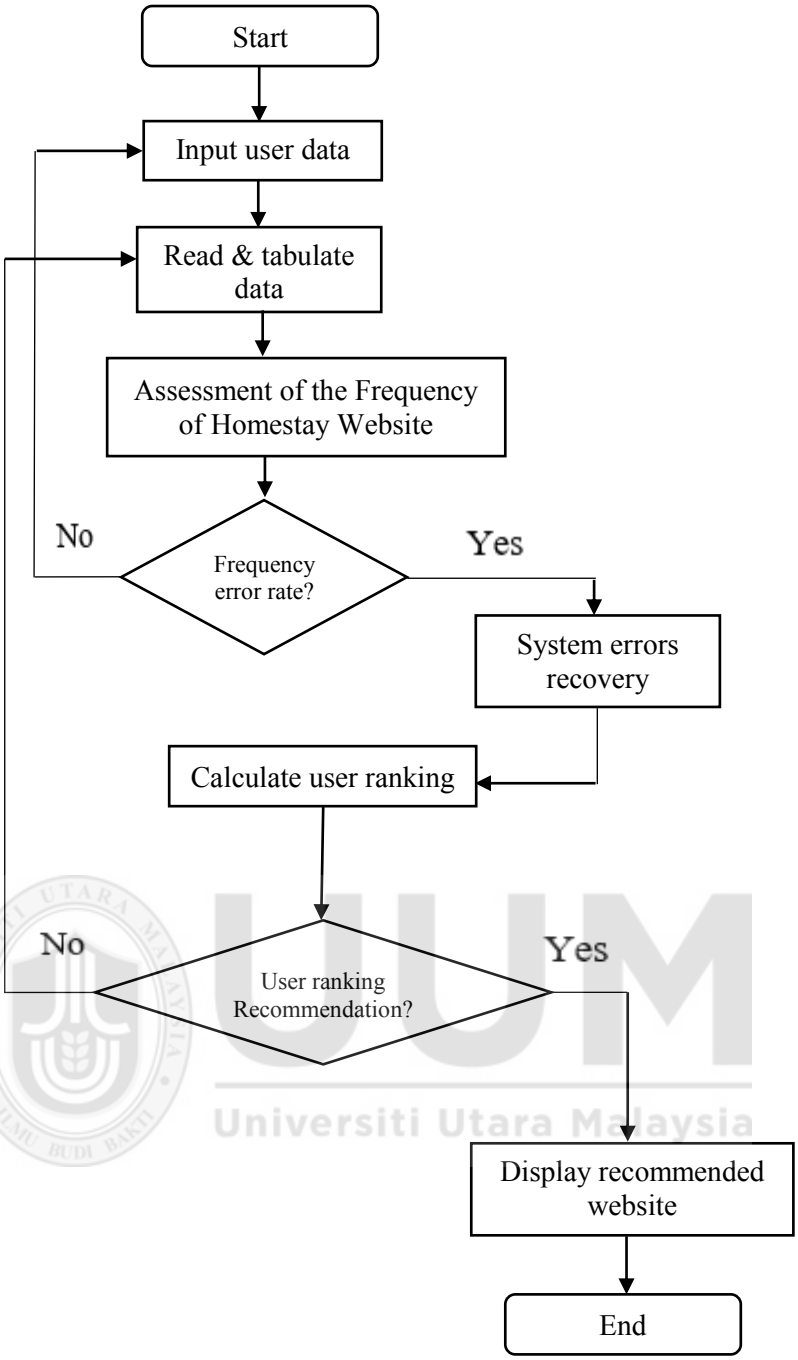

Figure 4.3. The flow chart of CBWR algorithm for the CBWR website

4.4.1 Input User Data

This is the first step of the flow chart. Input user data is the data from users (online client/customer/visitor) which is recorded by the system when a user accesses the homestay recommended website. The system counts the number of users by capturing

the user‘s behavior of those who access each website, which then will be used in the CBWR website.

4.4.2 Read and Tabulate Data

This step works by ensuring the data are readable and can be recalled in the database. The system also can read and analyze the date the website was accessed by every user. Besides, the system can keep and view the system driver to count the frequency of homestay recommender websites accessed.

4.4.3 Assessment of Frequency of Homestay Website visit

This is a very important step. This step works by counting the number of visitors who access each Homestay website. The count of frequency assessment is achieved through the CF function. Thus, the CF is a process to identify the total number of users of homestay websites (Dalvi & Gumaste, 2015). CF predicts the utility of the websites for a user based on the previously rated website by other like-minded user, which is represented in Figure 4.4. The figure shows an example of how a CF process works, where each user found different websites. Elaborating from these examples, user 1, 2 and 4 have all seen website A. In addition, user 1 and 5 have seen website B, whereas user 3 have only seen website C. Based on this information, we can identify that there are certain users who found the same websites and this reflects their same interest.

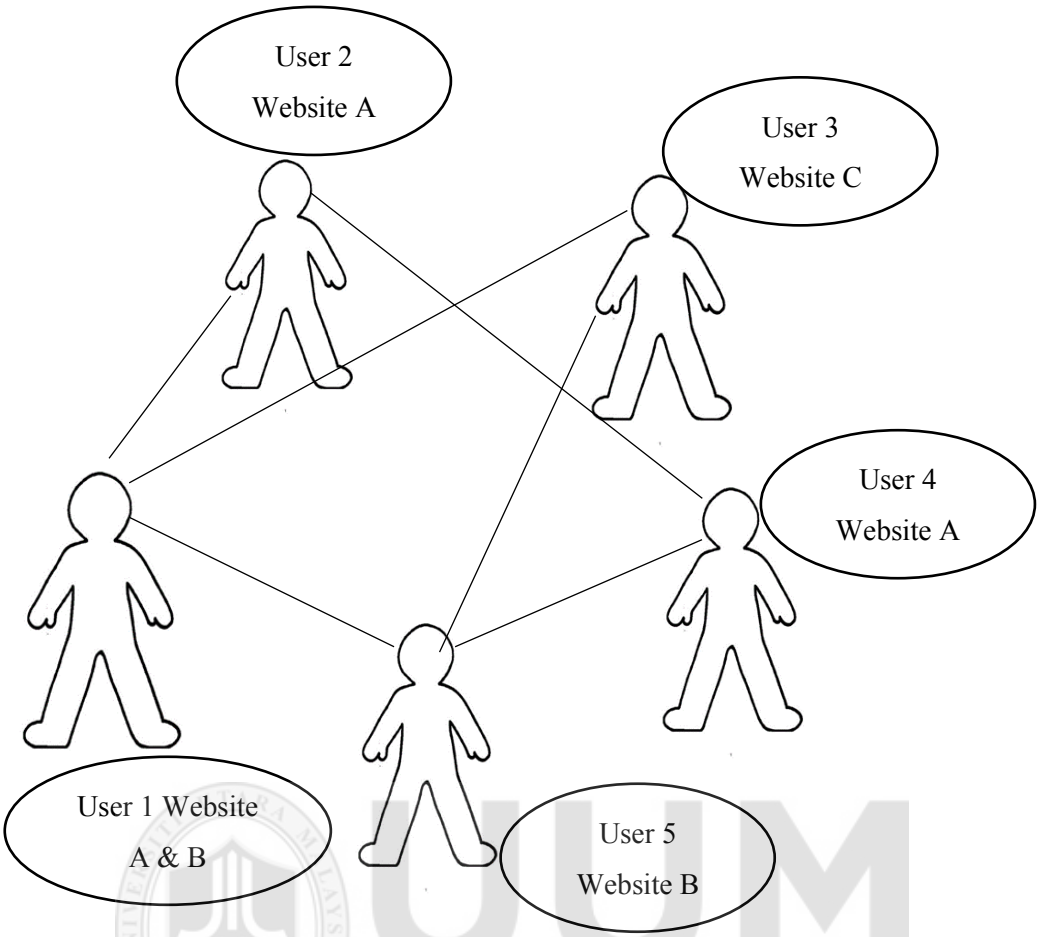

Figure 4.4. An example of the Collaborative Filtering Process

The CF assesses the homestay website by determining the rating and ranking of that website in comparison to the other websites. The most visited homestay website has the highest ranking, followed by the others in descending order. This ranking and rating are useful as it recommends that particular homestay website for the next user. The CF approach works through the frequency assessment which compares website users based on their pattern of ratings across many homestay users as can be seen in Appendix B. In this function, the researcher executed frequency assessment of homestay websites as follows.

$$R = U \times I \quad (4.1)$$

Where,

R = Frequency assessment

U = User ID

I = Number of users that access a particular recommended homestay website

4.4.4 Frequency error rate

The frequency error is the difference in frequency, after adjustment for the effect of the modulation and phase error (Gu, 2017)**.** In this step, the frequency error rate is calculated. If there is an error, then the system starts again from the beginning of the process. This system continues to compute frequency error until it calculates zero error and moves to the next step. Shani and Gunawardana (2011) implemented an almost similar formula to find Mean Absolute Error (MAE) (Thost, 2012), which is:

$$MAE = \sqrt{\frac{1}{|Rf|}(\sum_{(q,v)\epsilon Rf}(v - V)} \quad (4.2)$$

Where,

V = Rating of total user

v = Rating of a particular user

q = Predicted reference set

Rf = Highest recommendation

Therefore, the formula to calculate the frequency error rate is as follows:

$$f(x) = \sqrt{\frac{1}{|NI|}(\sum_{(n,v)\epsilon p}^{0}(K - L))} \quad (4.3)$$

Where,

$f(x)$ = Frequency error rate

N = User identity

L = Number of users that access the CBWR website

I = Number of users that access a particular homestay recommended website

K = Number of users that access the homestay website

p = User similarity value

The frequency error rate as in (4.3) produces the user ranking, which is fundamental to building the CBWR website.

4.4.5 System Error Recovery

This phase is known as system error recovery function. In this function, the assessment frequency error file which is embedded in the system executes the recovery until it meets the expected error rate. According to the requirement of system data, it continues to compute until the recovery system error rate is zero. Finally, the system figures out and provides a proper solution.

4.4.6 Calculate User Ranking

Based on the users' data, the ranking of the homestay recommended website is calculated. Many researchers have used similar formula for user ranking, such as for online sales (Dong et al., 2004; Damus et al, 2009) which is:

$$pNorm(q_{orig}) = \frac{1}{\sqrt{idf\ (department)2 + idf(name)2 + idf(sales)2}} \quad (4.4)$$

Where

pNorm = Highest sales Ranking

(q_{orig}) = Recommendations for query

idf = Number of users

department = Number of departments

name = User ID

salse = Number of sales

However, the researcher adapted Equation (4.4) and introduced natural logarithm (*ln*) to the formula to produce a more accurate user ranking as suggested by Thost (2012). Thus, the formula is as follows:

$$P = \frac{1}{\sqrt{(1+ln\ A^2)+(1+ln\ B^2)+(1+ln\ C^2)}} \quad (4.5)$$

Where

P = Calculated user rank

A = User identity number (Where *A* is integer)

B = Number of users that access the CBWR website

C = Total number of users for all homestay websites

Finally, the executed user ranking provides user recommendation for CBWR website.

4.4.7 User Recommendation

This is the final step in order to complete the system‘s activities. In this step, the system creates a homestay index by providing the ranking and rating of homestay recommended websites which is determined based on the frequency of users‘ access of each homestay recommended website. The recommended phase provides the new user list and recommended website ranking (Shi, Larson & Hanjalic, 2014) which is also used by Schafer, John and Reidl (2006). The rank is determined based on the number of users that access the CBWR website from the highest viewed to the lowest viewed. The calculation provides a list of a particular user that accesses the CBWR website, which shows the number of highest users until the lowest number of users in the homestay websites. From the list, the user provides user recommendations for the next user.

$H = U \times I;$ (4.6)

$W = R + (N+S)$ *for* $N=1, 2, \ldots, S$

Where,

H = User recommendation

U = Current user ID

I = Number of users that access a particular homestay website

N = New user identity number (Where N is integer)

S = Number of new users

W = Number of particular users for CBWR website

Figure 4.5 shows how a sample of CBWR website is mostly viewed.

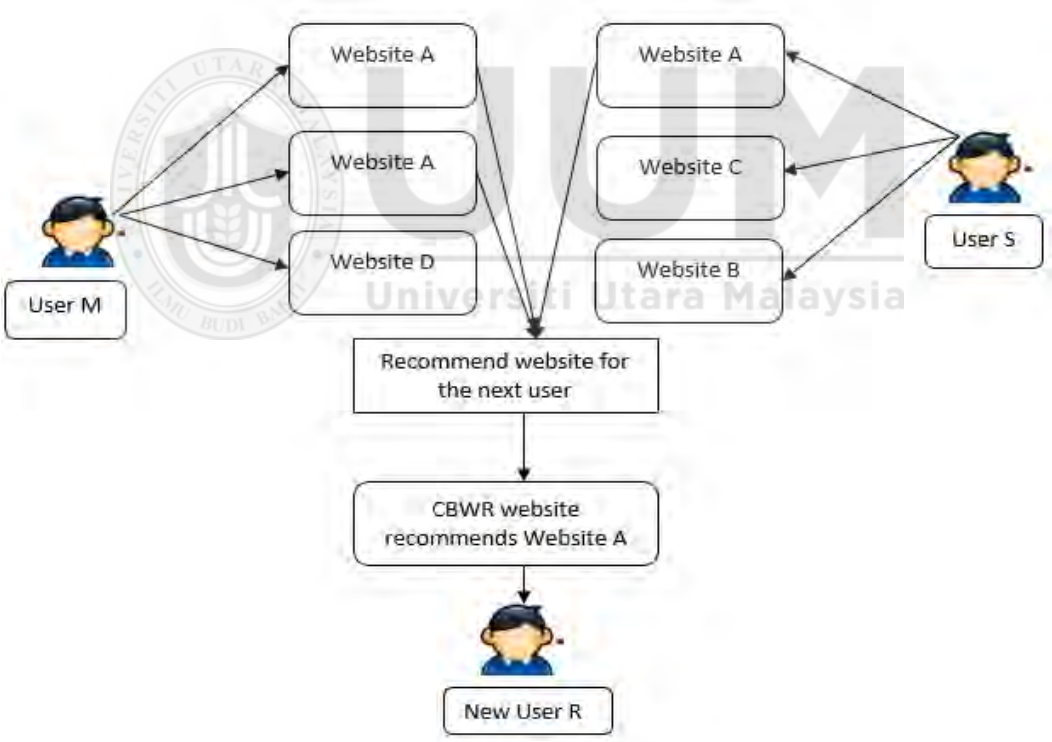

Figure 4.5. A sample of the process in CBWR website

4.4.8 Display Recommended Website

In this function, the recommended homestay website is shown in the list in descending order based on its ranking. In addition, this descending order is also based

on user likings, reservation and spending time on the precise website. The homestay list is displayed in the homepage of the homestay website. Finally, the recommended website is displayed for the next user.

4.5 Sequence Diagram for CBWR system

A Sequence diagram is a description of how the CBWR process works. Figure 4.6 below is a sequence diagram for CBWR system:

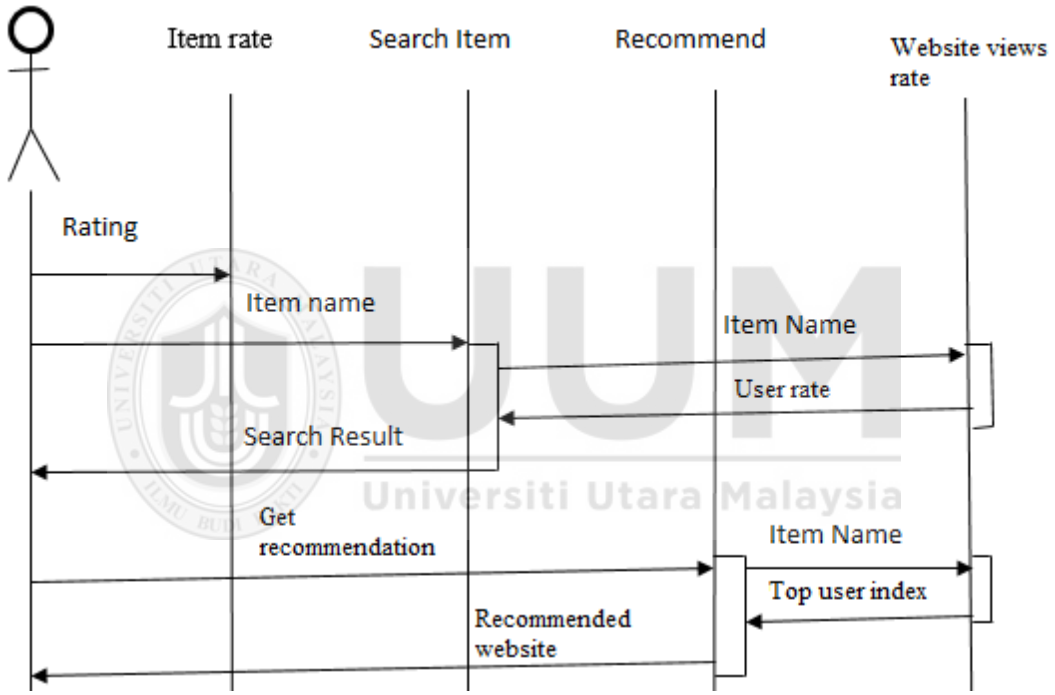

Figure 4.6. Sequence Diagram for CBWR System

The diagram starts with the user who used the website. After that, it goes to user rating items where the items were searched through the search engines. By the search item, the system finds the homestay website that was accessed more to recommend to the new user. The homestay recommendation is shown in a list in descending order. Finally, users can access the homestay website based on the recommendation.

4.6 Accessing the CBWR Website

This subsection is performed to show how a user accesses the CBWR system of homestay websites. This CBWR website is unique. It contributes a new function which works by viewing the user rates. Besides, it helps the users to find the other homestay websites through the CBWR system which evaluates the homestay websites. In addition, the CBWR system also recommends the homestay website that has been viewed most by previous users to the new user. Figure 4.7 is the system architecture of CBWR system for the homestay website.

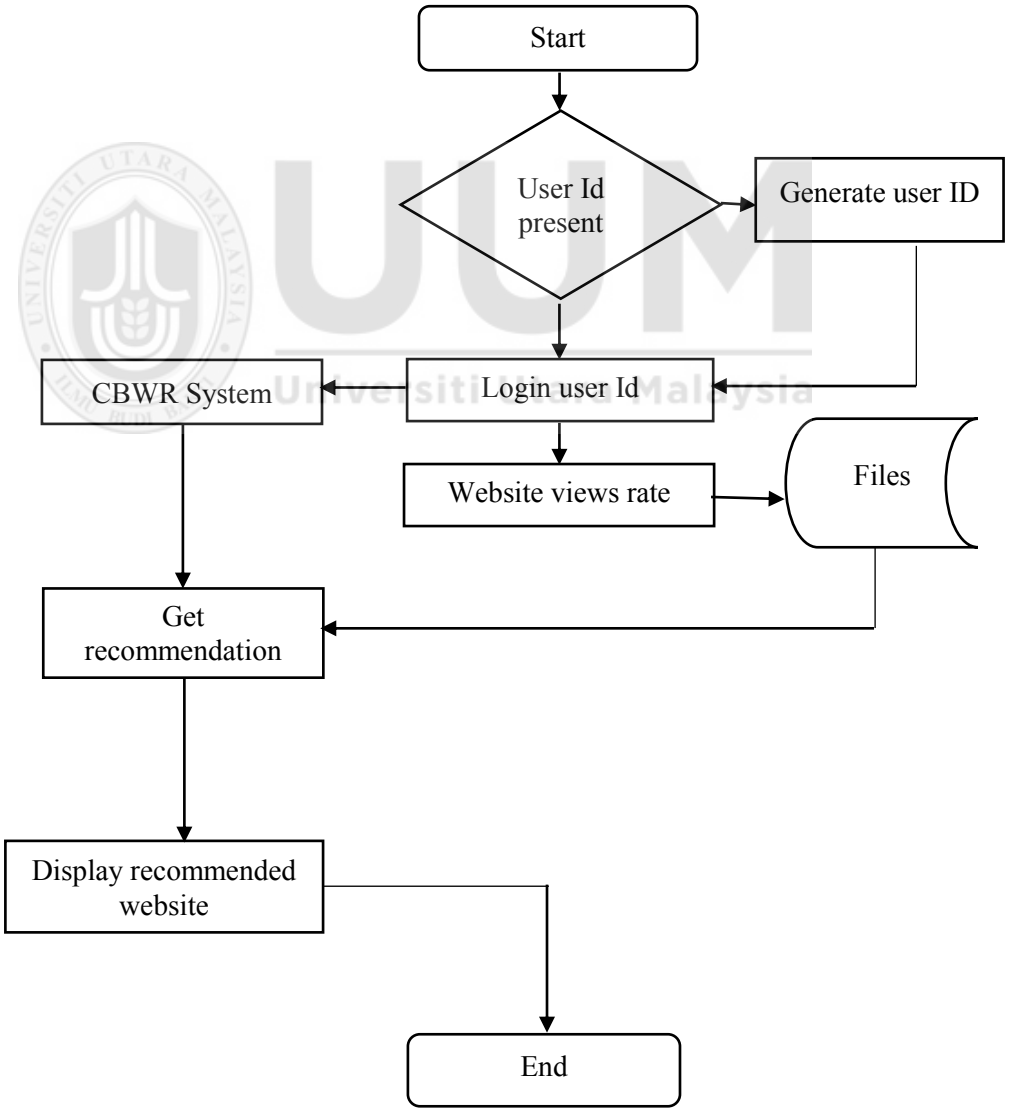

Figure 4.7. A structure chart for accessing the CBWR website

The system starts with creating a user ID to a user who starts to use the CBWR website. For the new user, the system generates a new user ID in order for the user to login into the homestay website. Once the user logs-in into the homestay website, the user‘s data is recorded to generate the website views rate which is calculated based on frequency. The rates are kept in a database file. Next, from the database file, the recommender algorithm embedded in the CBWR system provides the homestay recommendation for the new user to get to the recommendation stage. Finally, the recommended website is displayed in the homestay website window.

4.6.1 ID for User

It is the initial stage of entry to the website system. A radio-button (i.e., a button that allows users to enter into any system) is created which is provided in the Graphical User Interface (GUI). This radio button is integrated with the unified modeling language (UML) to create GUI tools. Then, dashboard function in the GUI was used to set the tab in the CBWR website.

4.6.2 Generate User ID

This function is the second stage to activate the user ID. To generate a user ID, the researcher used the same dashboard function. Then, a password is provided to access the User ID. This dashboard was inherited into the main system. Finally, the created User ID stage could work in the real system.

4.6.3 Login User ID

A radio button was again created. This radio button is the access point to create login user ID. The radio button needs to be activated online through MySQL database. It allows the user to login into system of the CBWR website.

4.6.4 Files

Files are databases where all documents, images and videos for website visitors are kept. There are two types of databases: homestay database and recommender system database. For the CBWR system, the PhP language and MySQL database are used for its CBWR website. Then only is the database ready to be used for the CBWR website.

4.6.5 Website Views Rate

The CBWR database captures all the new users‘ identity of each website visitor. Then, the detector panel which is embedded in the database creates a list of users into the CBWR website. Finally, the detector panel provides the user ranking for the CBWR website.

4.6.6 CBWR System

As given in Figure 4.3, the details of the CBWR algorithm are discussed. This algorithm is embedded in the CBWR system. In addition, it is a unique stage where the system is able to identify the expected homestay website. Finally, the CBWR system recommends the most accessed website to the new user based on the accessed rate.

4.6.7 Get Recommendations

In this phase, the frequency detector identifies the total users of CBWR website as previously calculated. It works based on the dashboard panel in the CBWR system. This function provides the frequency to get recommendation based on the website accessed in descending order.

4.6.8 Display Recommended Website

In this final stage, the CBWR website shows a list of recommended homestay websites based on their ranking and rating from visitors. The recommended homestay websites are displayed in the homepage of the CBWR website.

4.7 Validation and Evaluation of the CBWR Homestay website

In this section, how the validation and evaluation processes of the CBWR website's performance were done is described with regard to achieving the third objective. There are three types of validation processes involved in this study: face validity, CiteULike validation and Questionnaire using 7 Likert Scale validation. Besides that, the evaluation of the CBWR website was carried out by comparing it with several websites available on internet based on criteria of a good and effective website.

4.7.1 Validation of CBWR Website

In this section, we described the three validation processes for the CBWR website. In the first one, CiteULike is chosen for its capability on functionality analysis as suggested by Jiang, He and Ni (2011) and Avishay, Vivek, Jaime, Susan and Eytan (2014). On the other hand, a survey using questionnaire is used in the validation process is due to its purpose on indentifying users' opinions and preferences for the overall website as

recommended by Ting, Sunghee, Mingnan and Mengyao (2016) and Smyth (2016). Last but not least, face validity is employed in the validation process to ensure that the structure and appropriateness of the CBWR website as also been done by John, Anna and Gordon (2017) in their study involving website validation.

- **CiteULike Validation**

CiteULike (Avishay, Vivek, Jaime, Susan & Eytan, 2014) is a web service which allows users to save and share citations to academic papers. Based on the principle of social bookmarking, the site works to promote and develop the sharing of scientific references amongst researchers (Good, Tennis and Wilkinson, 2009; Jiang, He & Ni, 2011). Furthermore, CiteULike is adopted in the validation process since studies by Avishay, Vivek, Jaime, Susan and Eytan (2014) showed that user preferences can also be identified by CiteULike function. For the validation, the embedded system can recognize who have visited the CBWR website. The system calculates the users' likings and puts a ranking based on user behavior and likings. It is an automated function embedded into the CBWR system. Table 4.3 shows the criteria used for CiteULike validation.

Table 4.3

Criteria for CiteULike validation

Criteria for CiteULike validation	**Yes / No**	
Appropriate CBWR website domain	Yes	No
Content of particular website	Yes	No
Appropriate URL	Yes	No
Correctness of structure of homepages	Yes	No
Internet user friendly	Yes	No
Automated detction ability	Yes	No
Accuracy of user detection	Yes	No

- **Questionnaires Using 7-Likert Scale Validation**

A questionnaires using 7-Likert scale is a psychometric scale commonly involved in research that employs a questionnaire (Ovretveit, 2001). The Likert scale refers to the total sum of all Likert items in the questionnaire. The survey using the questionnaire can determine the performance of this CBWR website as suggested by Albiol-Pérez, Gil-Gómez, Lloréns, Alcañiz and Font (2014) in their similar study. In addition, the survey could determine the system execution and visibility of the CBWR website as has been similarly done by Mathew, McKibbon, Lokker and Colquhoun (2014). Furthermore, the survey can capture and analyse the user likings to the CBWR website, which is suggested by José-Antonio, Pilar, Sergio, Carmen, Hermenegildo and José-Antonio (2017) in their similar study. The questionnaire is used as a quantitative approach to assess a respondent‘s opinion as in Appendix A. This questionnaire is adopted from Ovretveit (2001). Hence, the survey is used to validate the effectiveness of the CBWR website, which automatically captured online user‘s behavior. The validation of the CBWR website is based on the 19 aspects, which are overall content, navigation, overall look, vocabulary, illustrations, text clarity, grammar or spelling error, information accuracy, timely up-to-date, sufficient information, logical, visualization, location, consistency, links, background color, visuals, easy to read and attractiveness. The seven-point Likert scale is described as (1) Strongly Disagree, (2) Somewhat Disagree, (3) Disagree (4) No Opinion/ Neutral (5) Agree, (6) Somewhat Agree (7) Strongly Agree with seven analytical scales as presented in Table 4.4.

Table 4.4

Seven analytical Likert scale

Scales	Strongly Disagree	Somewhat Disagree	Disagree	No Opinion/ Neutral	Agree	Somewhat Agree	Strongly Agree
Item	1	2	3	4	5	6	7

Source: (Kulas & Stachowski, 2009)

- **Face Validity**

For face validity procedure, the researcher chose three respondents because they are experts in the area of website development. It is important to get the experts opinions on the performance of this CBWR website.The scale used is categorical option type with ―Yes" and ―No" which indicates a favorable and unfavorable criterion, respectively. Favorable means that the item is objectively structured and could be positively classified under the thematic category. On the other hand, ‗unfavorable' means the item is not structured and negatively classified. Subsequently, the experts had to circle the scale as in Table 4.5. The criteria for face validity assessment in this study are based on Oluwatayo (2012).

Table 4.5

Scale for face validation

Scale for face validation	**Yes**	**No**
Appropriate context for the website	Yes	No
Correctness of grammar	Yes	No
The clarity and unambiguity of items	Yes	No
The correct spelling of words	Yes	No
The correct structuring the sentences	Yes	No
Appropriateness of font size	Yes	No
The structure of the instrument in terms of construction and well-thought out format	Yes	No

Moreover, the Cohen's Kappa index (Wynd and Schaefer, 2002) on face validity for CBWR website was also applied. The assessments were consolidated and analyzed for face validity. If the percentage of inter-rater agreement yielded 60% [Kappa value = 0.60, p = .000 < .005], then the validity is positive (Fleiss et al., 2003). An earlier work by Gelfand and Hartmann (1975) recommends a minimal acceptable Kappa of 0.50 for inter-rater agreement. However, Kappa value of 0.60 is generally considered to be satisfactory (Wynd and Schaefer, 2002; Sangoseni et al., 2013).

4.7.2 Evaluation of CBWR Website

The CBWR website was further evaluated by comparing it with several homestay websites available in the Internet. The comparison was based on criteria for website effectiveness, navigation, multifunction, bias and language, rating and ranking and tools, which was similarly done by Diao, Qiu, Wu, Smola, Jiang and Wang (2014). In doing this evaluation, these steps were followed.

Step 1: In the first step, the researcher compared those homestay websites in term of the navigation. The websites being compared with the CBWR are based in the USA, UK and Germany as stated on their websites.

Step 2: In this step, the researcher compared the multifunctional system among the CBWR and the homestay websites from the USA, UK and Germany.

Step 3: Bias and language used in the CBWR website and from the USA, UK and Germany were also analyzed.

Step 4: Further, rating and ranking based on online users of the CBWR website and those other homestay websites were compared.

Step 5: Finally, the researcher compared the recommender tools used in the CBWR website and those from the USA, UK and Germany.

4.8 Summary

This chapter describes the methodology involved in developing the proposed recommended system to achieve the research objectives. Despite the limits of the proposed recommended system, i.e., the CBWR website, the study is deemed as having improved the recommendation competencies, present multi-value ratings and delivered additional authentic recommendation techniques. The experimentation and results from this study are described in the next chapter.

CHAPTER FIVE

DATA ANALYSIS AND RESULTS

In Chapter four, the proposed methodology to develop the CBWR system for the HP was discussed. In this chapter, the implementation procedures and the outcomes of the research are presented and clarified in two phases. Phase one consists of criteria identification for an effective homestay website and requirements of CBWR website; while phase two consists of implementation of several homestay websites, implementation of homestay recommender website, i.e., the CBWR website and validation and evaluation of the CBWR website.

5.1 Phase 1: Criteria Identification for a Website

In this study, two types of data were identified: criteria for developing a good and effective homestay website; and requirements of homestay recommender website, that is the CBWR website.

5.1.1 Criteria for an Effective Homestay Website

The criteria for developing a good and effective homestay website were collected by reviewing the literature and existing homestay websites throughout section 3.2.1 and 3.2.2 including Figure 3.1 and Table 3.1. The criteria are compiled and presented in Table 5.1.

Table 5.1

The Criteria for an Effective Homestay Website

No	Criteria	Brief description
1	Graphics users interface	The art or skill of combining text and pictures in the homestay website.
2	Intranet development and design	Its changes where necessary, continuously improving components to meet the homestay website needs.
3	User friendliness	Easy to use or understand the homestay website.
4	Evaluation information from web	It is an evaluation tool that is integrated into the homestay recommender website system.
5	Unique product	Each individual homestay product.
6	Visual attraction	The quality that creates an interest or desire for the homestay website.
7	Multitask option	The facility of the homestay website that can do multi-tasks.
8	Tour package availability	Various promotions of the homestay website.
9	Recreation for fun	The activities done for enjoyment for the HP.

5.1.2 Requirements of CBWR Website

Subsequently, the second type of data was focused on requirements of CBWR website, in explained in 4.3.2. In addition, the requirements were constructed by studying numerous homestay websites available globally as discussed in section 3.3 and 3.4. Hence, the CBWR website criteria are compiled as in Table 5.2.

Table 5.2

Requirements of CBWR Website

No	Requirements/Characteristics	Brief description
1	Graphics similarities and dissimilarities	The similar and dissimilar behaviour of users for the homestay website.
2	Similar quality	The fact or quality of being alike.
3	Distinguished feature	The unique features of the homestay website or signature products.
4	Ranking	Having a specified rank in a hierarchy.
5	Top user rating	The highest user of the homestay website.
6	Visibility	The visibility of the homestay website.
7	Demographic location	The demographic location of the homestay website.
8	Most visited website	The most visited page of the homestay website.
9	Analysis and extracting	The execution of the homestay website.
10	Database of responses	The database that responds to users who are searching for the homestay website.

Source: Partly adopted from Yandi, Shikhar, Giuseppe & Ankur (2017); Francesco, Lior, Barche & Paul (2011); Toine & Antal (2009)

5.2 Phase 2: Implementation of CBWR Website

In this phase, the implementation process of the proposed CBWR website was demonstrated. In order to do that, seven HPs were selected for their websites to be developed. These HPS are the Pantai Jamai Homestay, Sungai Badak Homestay, Kg Paya Guring Homestay, Kampung Pulau Tuba Homestay, Mada Pulau Pisang Homestay, Kg Raga Homestay and D'Belimbing Homestay, located in the NCER. In addition, some data, such as their signature products, content, costs and visualization were collected from the respective homestay operators.

5.2.1 Signature Products for Homestay Program

In this section, several unique or signature products and the necessary requirements in order to construct the CBWR website are presented. The homestay signature products are the attractions of the respective HPs as given in Table 5.3 to Table 5.9.

Table 5.3

The Signature Products of Pantai Jamai Homestay

Signature Products
1. Fruits carving
2. Kites creation and competition
3. Traditional foods
4. Golden Jubilee Garden
5. Paddy Museum
6. Alor Star Tower

Table 5.4

The Signature Products of Sungai Badak Homestay

Signature Products
1. Fruit orchard
2. Gua Cempedak
3. Batik Painting Centre
4. Massage Center
5. Sungai Badak Waterfall

Table 5.5

The Signature Products of Kg Paya Guring Homestay

Signature Products
1. Stingless Bee farming (Kelulut)
2. Paddy cultivation process
3. Fruit Orchards
4. Rubber tapping
5. Traditional wedding
6. Heritage buildings
7. Traditional musical training

Table 5.6

The Signature Products of Pulau Tuba Homestay

Signature Products
1. Shellfish collection at the beach
2. Fishermen's jetty
3. Waterfall
4. Traditional weaving
5. Seafood BBQ

Table 5.7

The Signature Products of Mada Pulau Pisang Homestay

Signature Products
1. Traditional fish pond
2. Pet python and bird garden
3. Village fun ride
4. Pet eagle feeding
5. Boat riding at fish pond

Table 5.8

The Signature Products of Kg Raga Homestay

Signature Products
1. Day and night market at Pekan Yan
2. Mount Jerai
3. Murni Beach
4. Titi Hayun Waterfall

Table 5.9

The Signature Products of D'Belimbing Homestay

Signature Products
1. Village fun ride
2. As-Syura carnival
3. Rubber estate
4. Night market
5. Grasshopper sound competition

All the signature products were used in the development of the respective homestay websites.

5.3 Requirements for CBWR Website

Subsequently, for the CBWR website, the administration log-in page Joomla, control panel, article add-in, cPane log-in, CBWR database and phpMyAdmin were created. The functions of the CBWR website are described in Figure 5.1. The details of implementation of CBWR website process are in the following subsections.

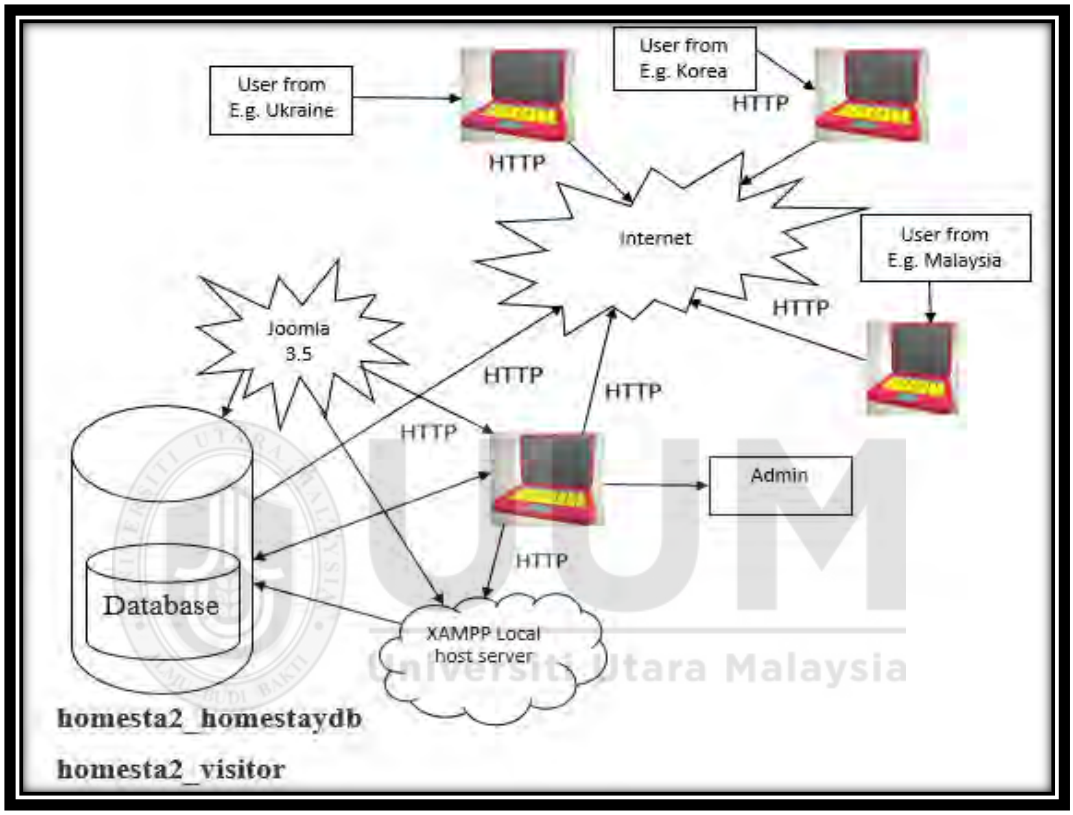

Figure 5.1. CBWR website functions

5.3.1 Administration log-in page Joomla

Joomla is written in PHP, uses object-oriented programming (OOP) techniques (since version 1.5) and software design patterns (Russel and Peter, 2005). In addition, Joomla provides a template for building a web page and works through XAMPP software (Afolabi and Ajayi, 2008). Furthermore, Joomla is a free and open-source content management system (CMS) for publishing web content in the CBWR website (Russel and Peter, 2005). It is built on a model–view–controller web application

framework that is used independently in the CBWR website. On this page, the administrator is allowed to enter into the Joomla system as exhibited in Figure 5.2. It allows the administrator to edit, add-article and media documents in the CBWR system.

Figure 5.2. Joomla log-in page for the CBWR system

5.3.2 Control Panel

The key to go into the whole CBWR system is the control panel as designed in Figure 5.3. It also controls the administrator‘s access into the CBWR system. The information made available on the control panel includes those related to visual, rating, signature events, media, modules and categories, among others.

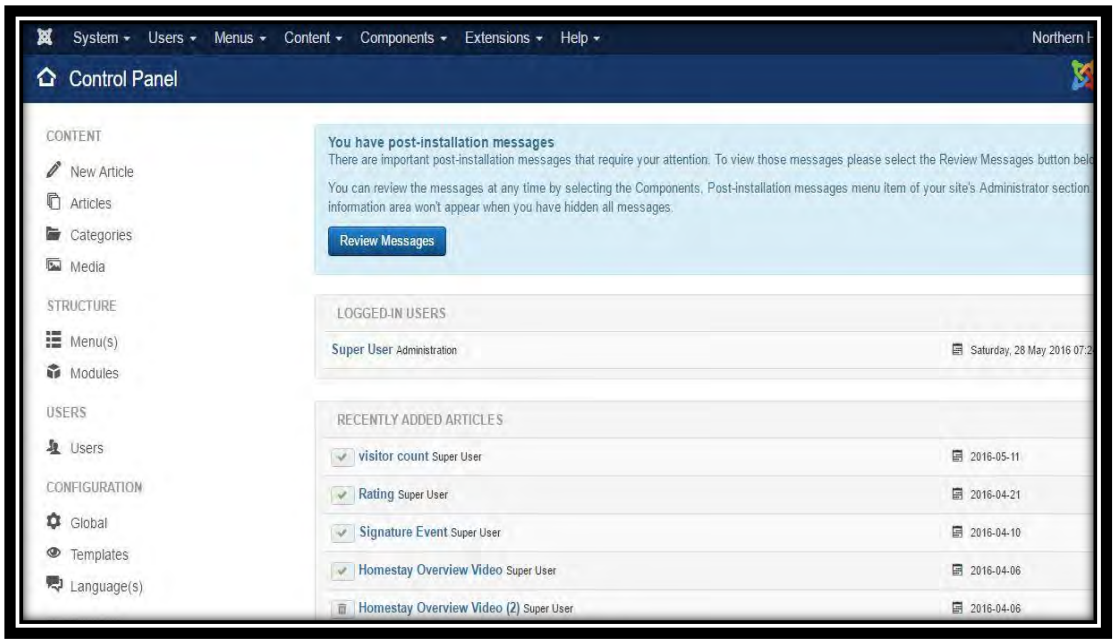

Figure 5.3. Control panel for the CBWR system

5.3.3 Article Add-in

Article Add-in facility allows the administrator to add or drop any kind of PDF, Microsoft Word and Excel files in the website template. The article add-in process is as shown in Figure 5.4.

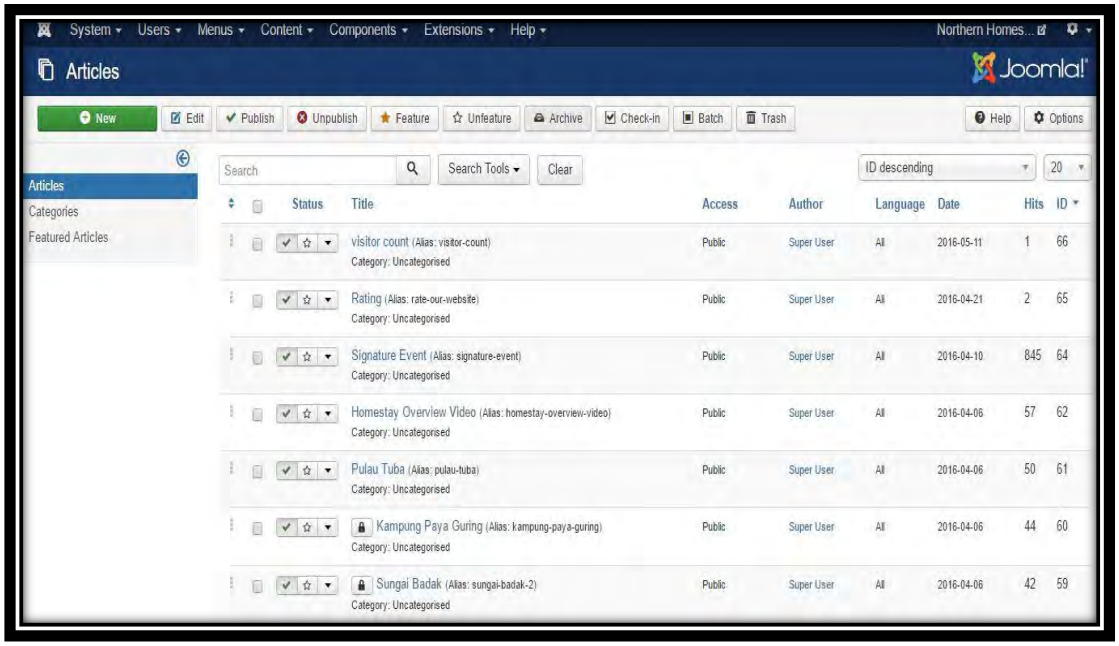

Figure 5.4. Article Add-in facility for the CBWR system

5.3.4 cPanel Log-in

cPanel is a log-in page to go into the database. This panel goes into all databases of the CBWR system, PHP and MySQL. The cPanel route is shown in Figure 5.5.

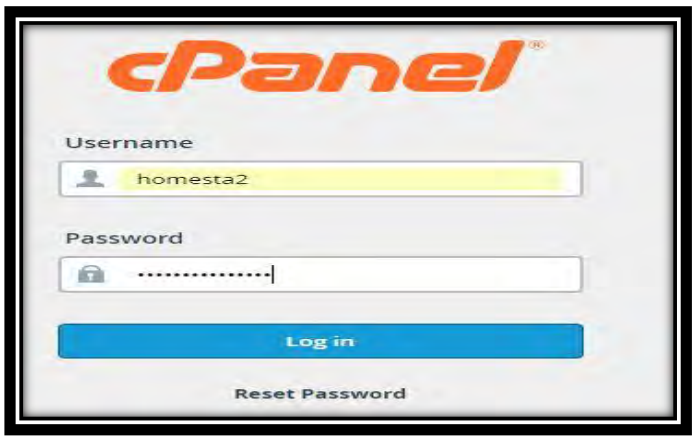

Figure 5.5. cPanel for the CBWR system.

5.3.5 CBWR Database Design

Two databases for the selected HPs in the NCER of Malaysia were created. For the individual homestay websites, homesta2_mahadi database was used and for the CBWR website, homest2_visit2 database was used. The databases were created by employing the built-in Joomla software. It is embedded in the database in two parts. First, it consists of media and text to comply with user demands. Second, its consists of storage in the mainframe to comply with user demands as well. Figure 5.6 shows the synergy of the two databases for the CBWR database. These are homestay2_mahadi and homest2_visit2. The homestay2_mahadi is the storage for CBWR website content and the homest2_visit2 database is used to store visitor‘s information from the CBWR database. These two databases relate to the central database and support the CBWR website database.

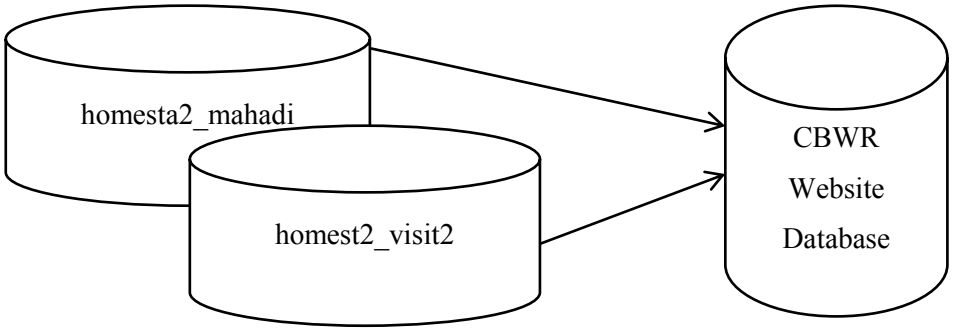

Figure 5.6. The graphical representation of the CBWR Database

5.3.6 phpMyAdmin

In this section, different codes could be added into or dropped from the CBWR system. Every type of PHP code is saved in the system‘s memory of the CBWR website. Figure 5.7 shows the structure of the phpMyAdmin.

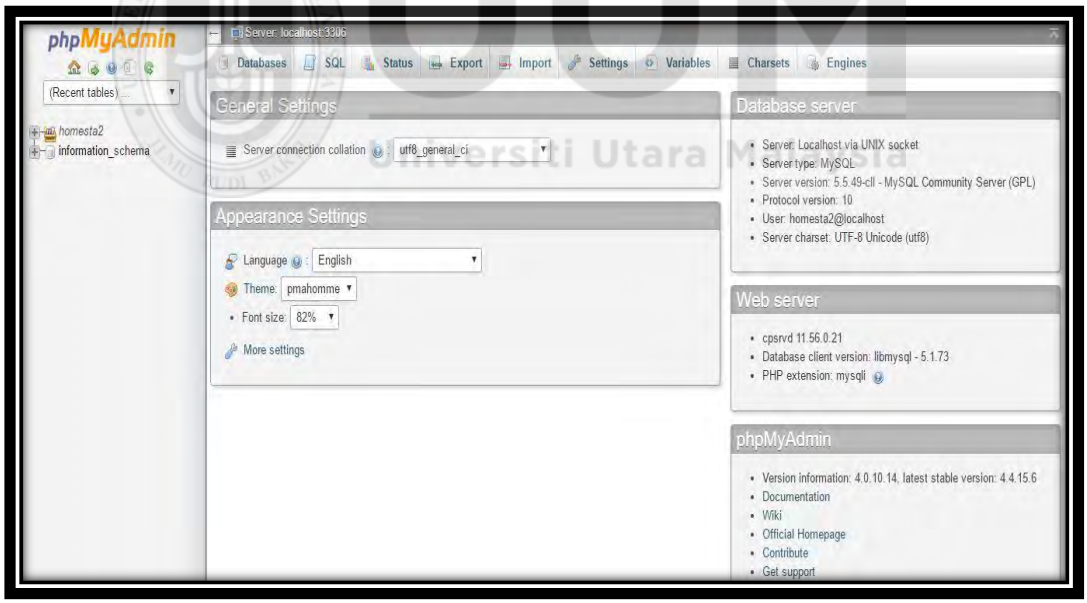

Figure 5.7. phpMyAdmin

5.4 Primary User Interface for CBWR Website

A primary user gets access to the CBWR website through any search engine, such as Google search. The user comes into the homepage, where he/she can see the most recent visited page list, Booking and Contact and Easy search functions.

5.4.1 Search Engine

A search engine is a place where one requests for certain information by writing a desired word or sentence that can find the targeted web link. Based on the word or sentence, the search engine shows recommended results. Similarly, the search engine can detect the homestay websites across the world. One popular search engine is Google search as exhibited in Figure 5.8.

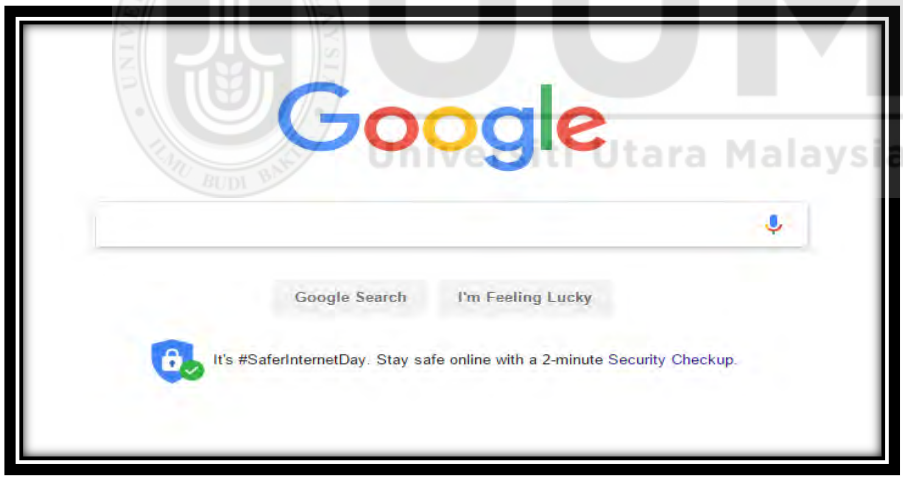

Figure 5.8. Google search engine

5.4.2 Homepage of CBWR website

Homepage is the beginning page of the CBWR website. Whenever a user goes to this website, the homepage will appear. Homepage is the outlook of all the information in

the website. It consists of many information pages, images, buttons and contact details of the administrator as exhibited in Figure 5.9.

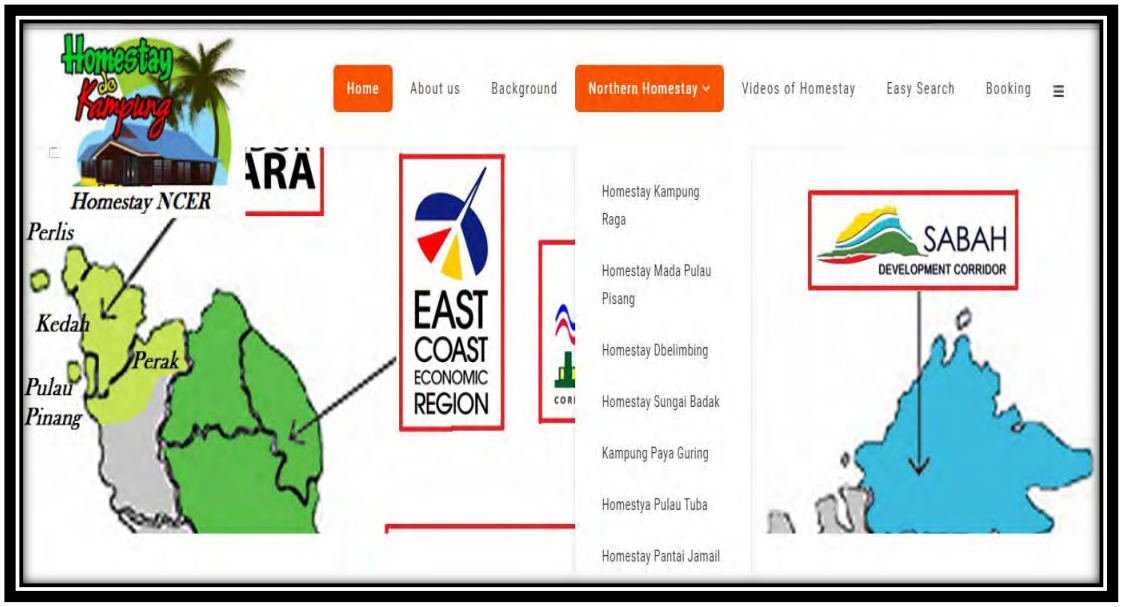

Figure 5.9. Homepage of the CBWR website

5.4.3 Most Recent Visited Page List

The list shows the most visited page by a visitor or user. It shows the list of recently visited homestay websites. In this study, seven homestay websites were found with rating in descending order. The most visited page is shown at the top of the list as exhibited in Figure 5.10.

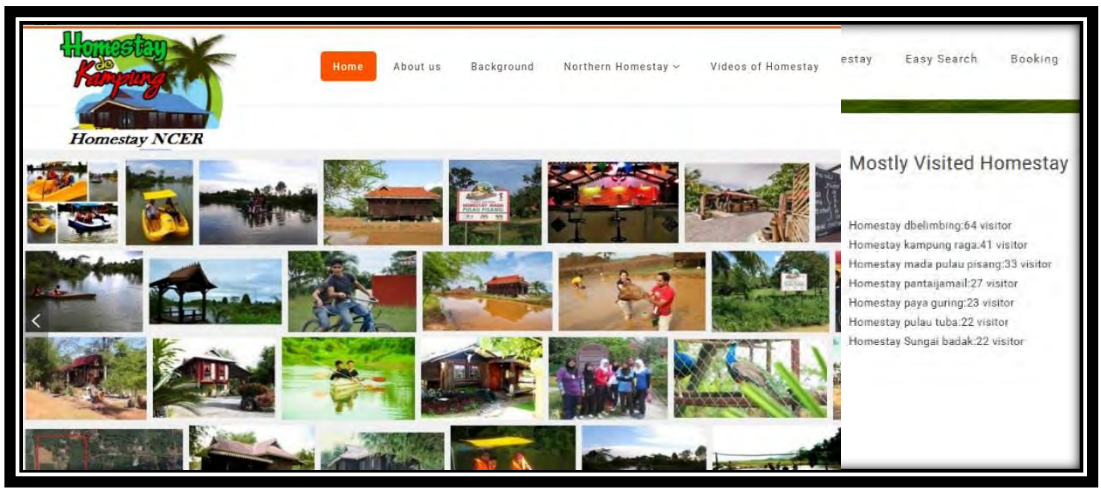

Figure 5.10. The most recently visited page list

5.4.4 Booking and Contact

Booking and Contact form is a facility for reservation of any room or package for a specific time period together with booking confirmation by an automatic email in real time. This facility is available in the CBWR website. It is constructed for the purpose of communication with the operator of the specific homestay. The form for this communication is as shown in Figure 5.11.

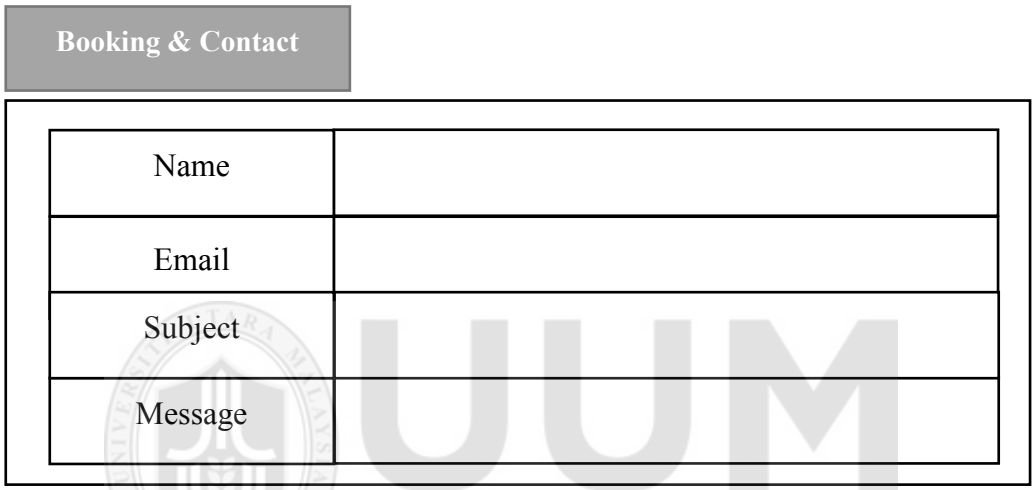

Figure 5.11. Booking and Contact form

5.4.5 Easy Search

Easy search is a search facility for any user. It is created to find any specific information on the CBWR website. Figure 5.12 shows the procedure of the easy search options.

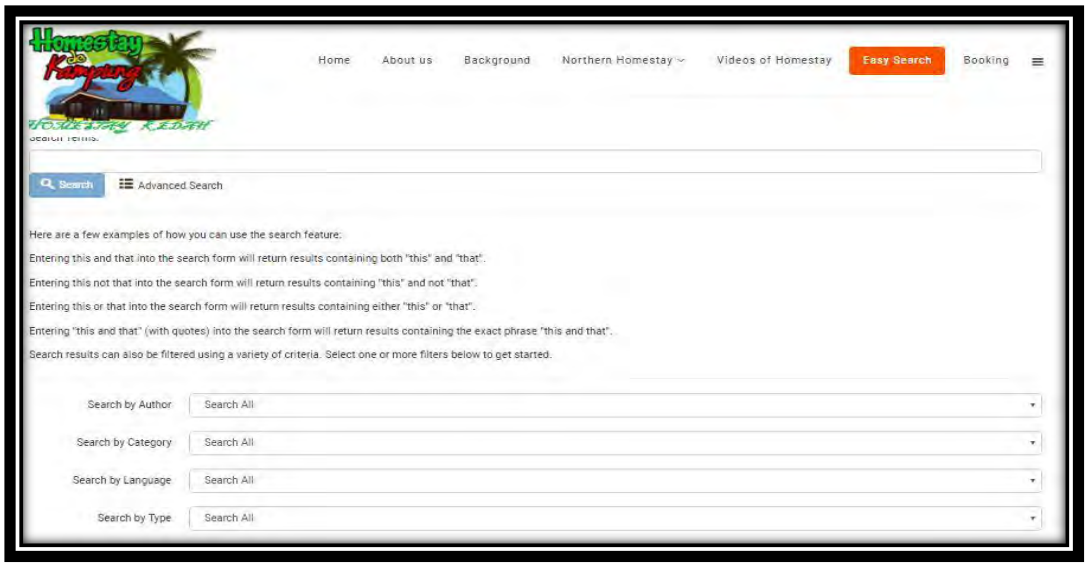

Figure 5.12. Easy search options

5.5 The Overall CBWR Website

In this section, the final output of the study is demonstrated. Homestay operators from 26 HPs in the NCER of Malaysia (Kedah, Perlis and Pulau Pinang) were identified. However, only seven homestay operators agreed to participate. Thus, the CBWR website was constructed based on the contributed data from the seven HPs. In the following subsections, each of the seven homestay websites that was constructed and integrated in the CBWR website is shown.

These HPs offer village-style accommodation but comfortable with unique local attractions and activities. Subsequently, we created a portal for each of the seven volunteered HPs. They are captured in each of the homestay websites as much as possible and presented in the following subsections.

5.5.1 MADA Pulau Pisang Homestay

MADA Pulau Pisang Homestay is situated in the Kubang Pasu District, which is only 2.5 km from the town of Tunjang, seven km from the town of Jitra and 28 km from

the city of Alor Star. This HP is also supported by the Muda Agricultural Development Authority (MADA) besides the Ministry of Tourism and Culture (MOTAC). The name comes from having many banana plants around the village. It is a traditional village surrounded by the lush greenery of paddy fields. Figure 5.13 and 5.14 show the snapshots of the homestay with its signature products and activities.

Figure 5.13. Landing page of MADA Pulau Pisang Homestay

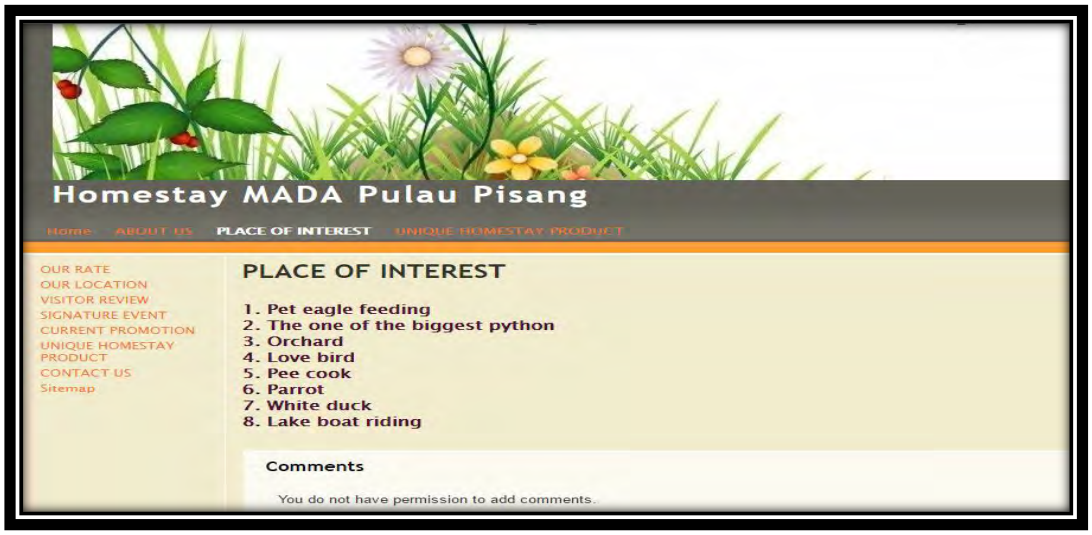

Figure 5.14. MADA Pulau Pisang Homestay.

5.5.2 Kg Raga Homestay

Kampung Raga Homestay is a village which was opened in 1920 by a Malay family and is located 1.5 km from the town of Pekan Yan Besar, Kedah. Now the entire population who lives in Kampung Raga has family ties and strong relationship. In the beginning, it was called Kampung Keluarga, which means family village. Later, the name was changed to Kampung Raga due to shortening of words involved through years of communication. It borders several villages, like Kampung Permatang Keramat and Kampung Jawa in the north, Kampung Permatang Chengai in the west, Kampung Bukit Belida in the south and Jerai Hill reserve forest in the east. Figures 5.15 and 5.16 show the snapshots of landing page with signature products and activities.

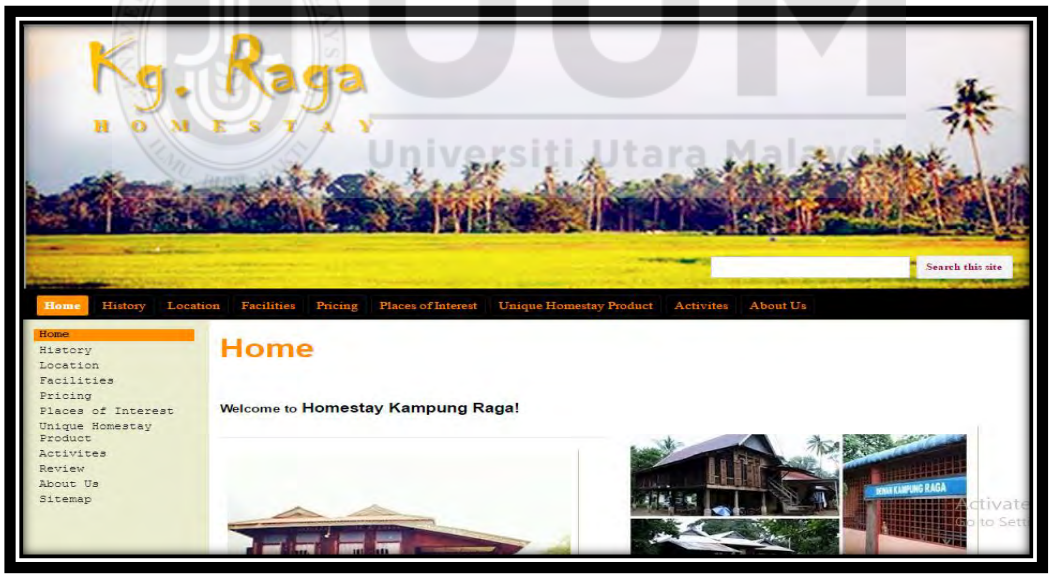

Figure 5.15. Landing Page of Kampung Raga Homestay

Figure 5.16. Kampung Raga Homestay

5.5.3 Sungai Badak Homestay

Sungai Badak Homestay is situated in Gurun, Kedah at the foot of the Jerai Hill. It is one of the reputed homestays with natural views. The homestay was opened on 21 February 2007 and has since provided facilities to tourists from within and outside the country. Figures 5.17 and 5.18 show the snapshots of the homepage for Sungai Badak Homestay with its signature products and activities.

Figure 5.17. Landing page of Sungai Badak Homestay

Figure 5.18. Sungai Badak Homestay

5.5.4 Homestay Kg Paya Guring

Kg Paya Guring Homestay is located nearby the town area. It is located four km from the royal town of Arau, Perlis with tourist attractions, such as the Royal Gallery. It is also not far away from Kangar, the capital of Perlis state. The good thing is that the homestay is sort of bounded by a campus environment, like Universiti Technology Mara (UiTM) Arau and Polytechnic Syed Sirajudin. Furthermore, the uniqueness of this homestay is its inviting fruits orchards and bee farm. Figures 5.19 and 5.20 show the snapshots of the homepage for Kg Paya Guring Homestay with its signature products and activities.

Figure 5.19. Landing page of Kg Paya Guring Homestay

Figure 5.20. Kg Paya Guring Homestay

5.5.5 Kampung Pulau Tuba Homestay

Pulau Tuba is an island situated in the greater Langkawi Island, Kedah. So, Kampung Pulau Tuba is a village on the Tuba Island. Hence, it can be reached only by sea from a jetty, which is close to the Langkawi Jetty Point Complex. The island is famous for its traditional fishing for a living, in addition to being a remote and beautiful island. Hence, with all the amenities in these islands around Langkawi, the visitors tend to stay for months and enjoy all the natural beauty of the several islands. Visitors

normally like to enjoy the outdoor activities and this is the best location for them to do all kinds of water sport activities. The walking tours on these islands are enjoyable and the visitors come from different parts of the world. Figure 5.21 and 5.22 show the snapshots of Kampung Pulau Tuba homestay with its signature products and activities.

Figure 5.21. Landing page of Kampung Pulau Tuba Homestay

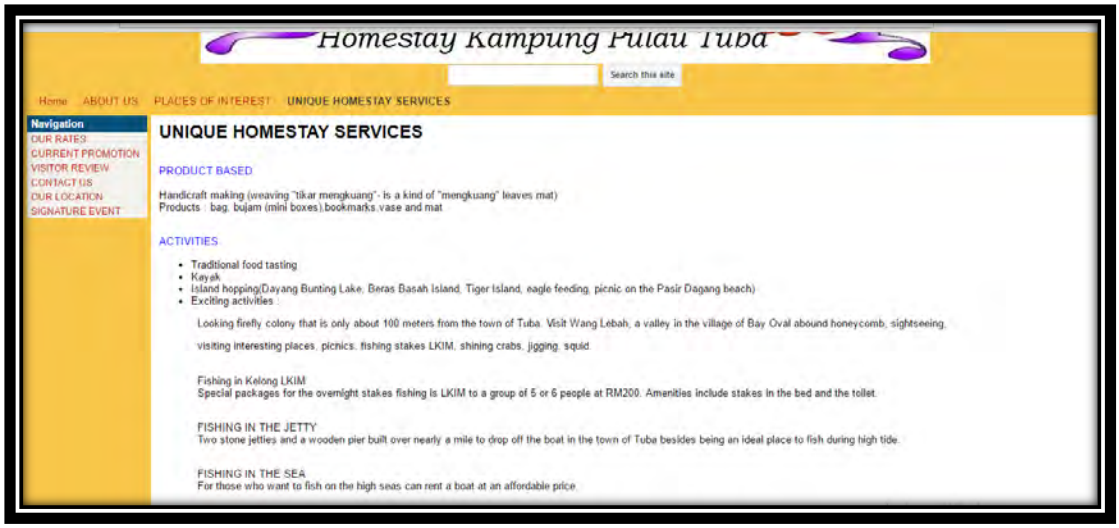

Figure 5.22. Kampung Pulau Tuba Homestay

5.5.6 D'Belimbing Homestay

D'Belimbing Homestay was established by the Federal Consolidation and Rehabilitation Authority (FELCRA) and is registered under MOTAC since 10 November 2008. This village is strategically located in the vicinity of lush greenery of Puncak Janing or Janing Hill Waterfall and Recreation Park. Figures 5.23 and 5.24 show the snapshots of landing page with signature products and activities of the D'Belimbing homestay.

Figure 5.23. Landing page of D'Belimbing Homestay

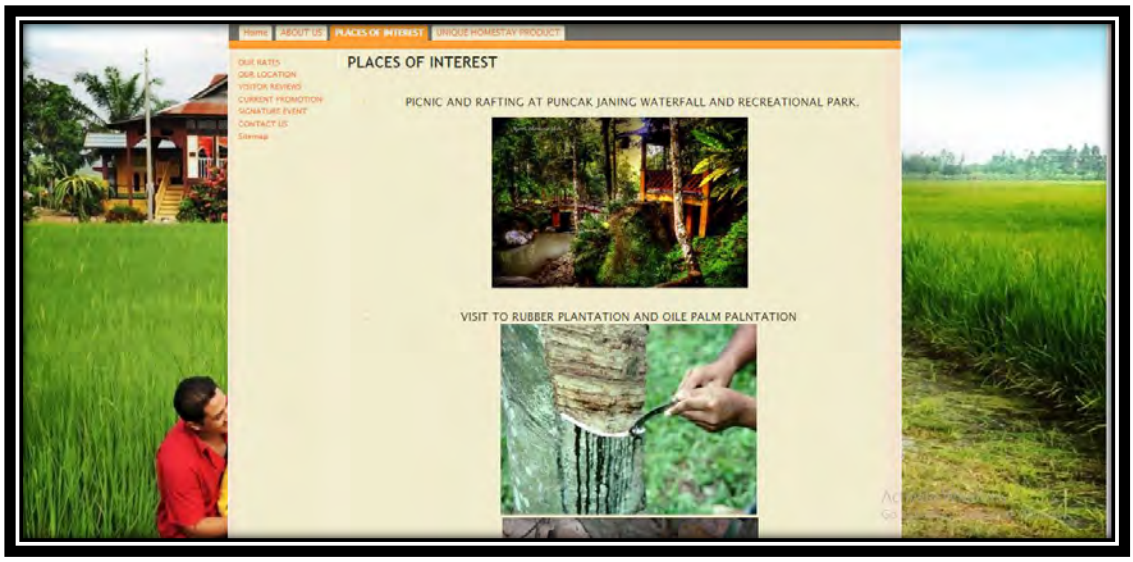

Figure 5.24. D'Belimbing Homestay

5.5.7 Pantai Jamai Homestay

Pantai Jamai Homestay, located near Jalan Langgar, Alor Setar, Kedah is the youngest HP in the NCER and supported by MOTAC. It was inaugurated on 30 August 2013 and provides facilities to tourists from within and outside the country. Figure 5.25 shows the snapshot of the homepage of Pantai Jamai Homestay. Furthermore, Figure 5.26 highlights the homestay signature products and activities available.

Figure 5.25. Landing page of Pantai Jamai Homestay

Figure 5.26. Pantai Jamai Homestay

5.6 Results on Validation of the website

In this section, the three types of validation for the CBWR website are described. The first one, the CiteULike tool, acts as a validation tool for the functionality of the CBWR website. For the second one, a survey using a questionnaire based on the 7-point Likert scale was used. The third one is through face validity process.

5.6.1 CiteULike

CiteULike is an online validation tool for the CBWR website. In the CBWR website, a hit button is embedded to capture the results of validation of the system as in Figure 5.27. It provides mainly the analyses on users.

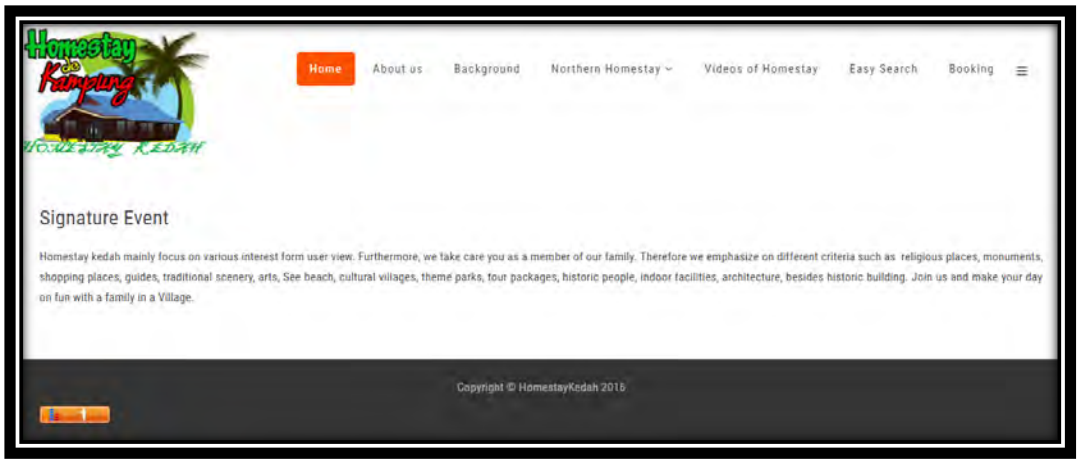

Figure 5.27. Hit option of CBWR website at the left bottom of the picture

5.6.1.1 Analysis of location

The function of geolocation as available in CiteULike is to list the countries where users that have visited the researcher‘s site are from. It is a proof that this CBWR system works properly and receives messages from around the globe. The number of users who have visited from abroad can clearly be seen. For example, Figure 5.28 as based on April 2016 shows the country, names and number of visitors, where 67 users were from Malaysia, seven users from Bangladesh, three users from the USA, two users from Italy, two users from the UK, one user from Russia, one user from Thailand and one from the Korean Republic. It also shows the total number of pages viewed from Malaysia is 342, Bangladesh 14, USA 15, Italy 9, UK 3, Russia 1, Thailand 5, Korean Republic 1, New Zealand 10, Japan 2, Hong Kong 2 and Israel 1.

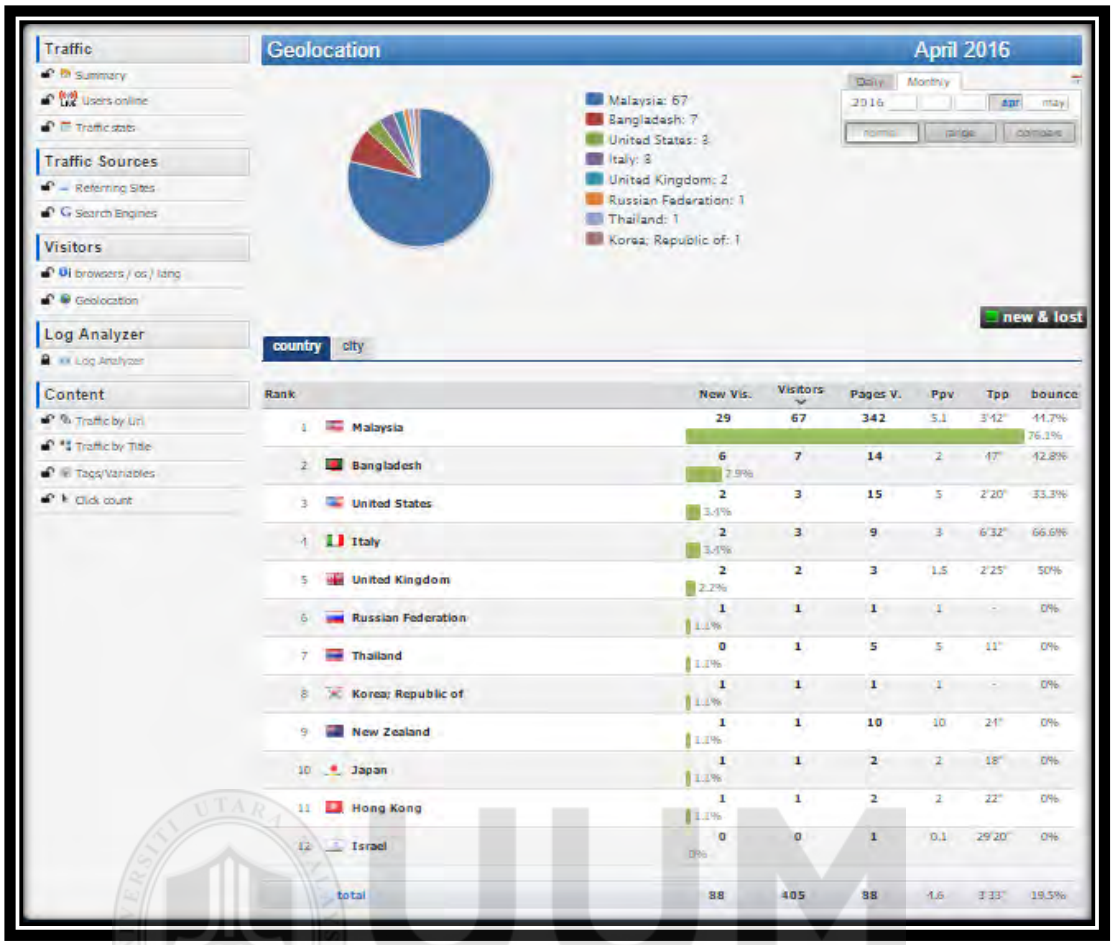

Figure 5.28. Analysis based on Geolocation

Table 5.10

Task based on Geolocation functions

Function	**Task**
Visitors	List of total visitors
Pages views	List of pages views
Ppv	List of visited average page views per visit
Tpp	List of average times spent on each page
Bounce	Ratio of visit viewing only one page
City	Shows the specific city, such as Sintok.
Visitors	Geolocation
Log analyzer	Shows the login detail
Content	Traffic by Url
Rank	List of visitors‘ countries
Frist time visitors	List of new visitors
Traffic	Summary, user online and traffic stats
Traffic source	Reference sites and search engines
Date	Date browsed

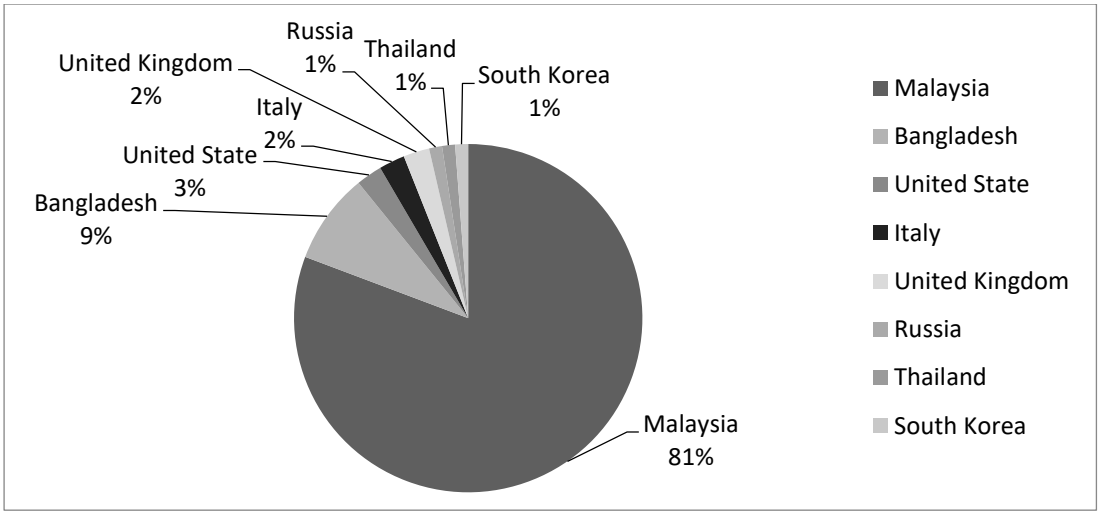

Figure 5.29. Percentage and number of users for the CBWR website based on location

Similarly, Figure 5.29 shows the pie chart representing the number of users based on percentage. It converts the number of users into percentage form. For example, Malaysia 81%, Bangladesh 9%, USA 3%, Italy 2%, UK 2%, Russia 1%, Thailand 1% and Korea 1%.

5.6.1.2 Analysis of Views

Figure 5.30 and 5.31 shows the number of visitors and the number of pages in more detail. Figure 5.30 shows the total page view is 1,075, total visitors 295, page views per visit 4.14 and the visited date is 22 March 2017. It also describes general statistics, account summary and characteristics of the visitor.

Figure 5.30. Number of views of the CBWR website

In Figure 5.31, the bar chart shows the number of first-time visitors is 14, average visitors are 35%, visitors 41 and page views 146. It also shows the highest visited date, which is 9 February 2017, 2 March 2107 and 6 March 2017. On 9 February 2017, the first-time visitor is 1, visitors 5 and page views 25. On the other hand, on 2 March 2017, the first-time visitor is 0, 3 visitors and page views 25. On 6 March 2017, the first-time user is 0, visitors 3 and page views 21. In order to view all descriptions or behavior of different visitors on different days, one needs to click on the bar, and then the detailed information will pop up. These results are summarized in Table 5.11.

Table 5.11

Visitor's details for the CBWR website

Date	Number of first time visitor	Number of visitors	Average number of visitors	Page views
9 Feb 2017	1	5		25
22 March 2017	14	41	35	146
2 March 2017	0	3		25
6 March 2017	0	3		21

Conclusively, as a new and amateur portal, it is a positive sign that the CBWR website is getting attention from users worldwide. Although, the number of users is relatively small, but given more time for it to be live, we are confident that the number will increase tremendously. On the other hand CiteULike benchmark is that the user IP must be different from previous user.

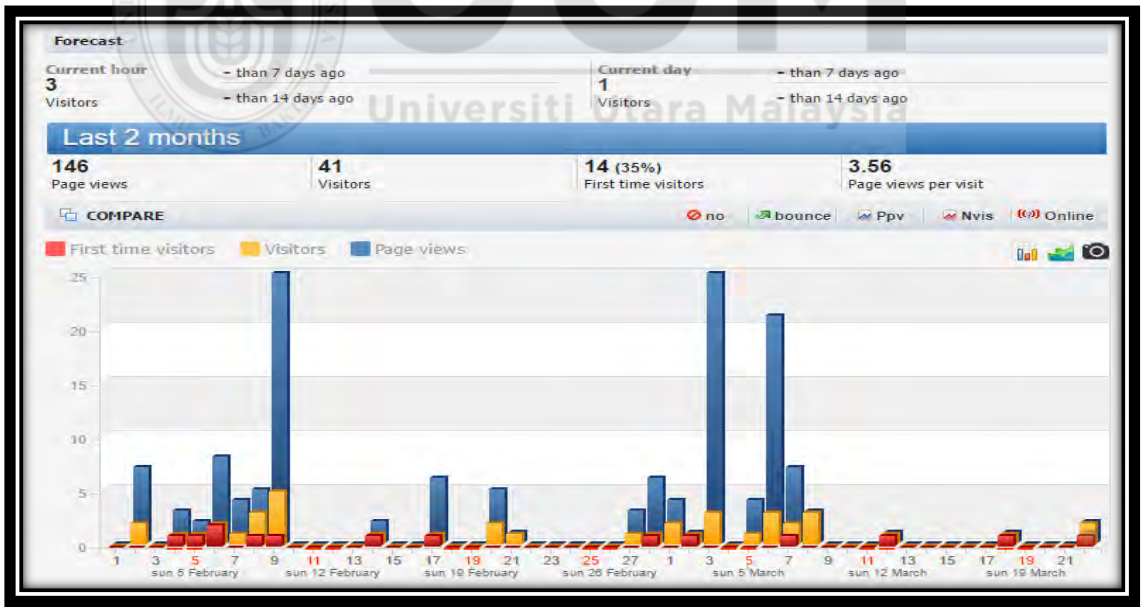

Figure 5.31. The bar chart of visitors of CBWR website

5.6.1.3 Usage on Operating System

Figure 5.32 shows the types of operating systems most used for visiting homestay websites. It shows that one visitor each used Windows and Apple on 23 March 2017. It is clear all types of operating systems can fit and be compatible with this web recommender system to visitors.

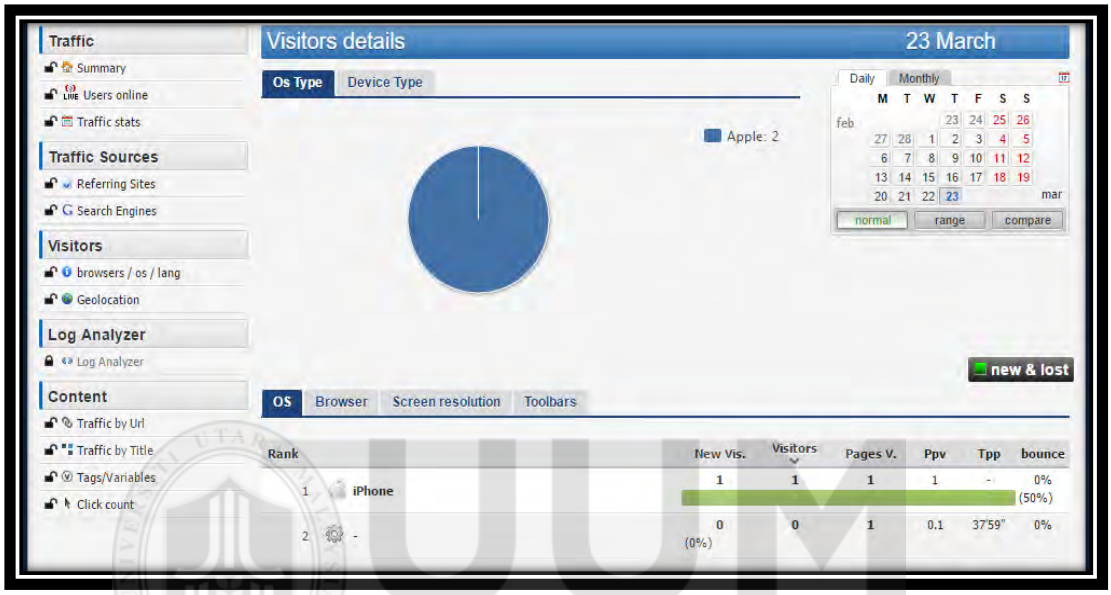

Figure 5.32. Analysis of Operating system

Figure 5.33 shows the analysis of the operating system used for visiting homestay websites in April 2016. It shows that 36 visitors used Android, 28 used windows and 14 used Apple. It is clear that all types of operating systems can fit and be compatible with this web recommender system to visitors.

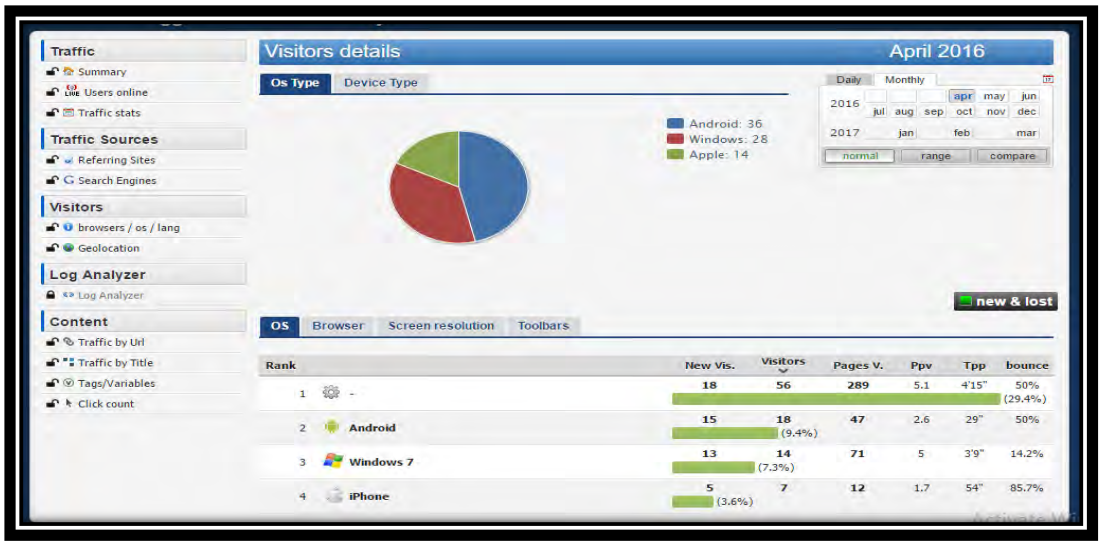

Figure 5.33. Analysis of operating systems from 2016

5.6.1.4 Overall Discussion on CiteULike

In this section, the validation of the CBWR system on website was conducted based on the visitors' reviews. Table 5.12 shows the number of visitors that viewed the CBWR website in descending order. The CBWR system could be identified well by visitors as can be seen from their visited pages. So it is clear that the CBWR system is working properly. Based on the visitors' views from various places, the researcher can conclude that the CBWR system is validated as has similarly been done by Kurata and Hara (2014) and Umanets, Ferreira and Leite (2014).

Table 5.12
Visitors' views statistics

Homestay	**Number of visitors who viewed the website**
Kampung Raga	280
D'Belimbing	247
Sungai Badak	214
Mada Pulau Pisang	202
Kg Pulau Tuba	187
Pantai Jamai	178
Kg Paya Guring	146

5.6.2 Survey Analysis on the Questionnaire

In this section, the results of a survey carried out using a questionnaire based on a 7-point Likert scale are reported. 100 Respondents were randomly selected from the university community and shown the developed CBWR website. The respondents comprised students, researchers and staff, who are from different nationalities, such as Chinese, Thai, Algerian, Pakistani, Yemeni, Jordanian, Iraqi, Bangladeshi and Malaysian. They were able to browse the CBWR website and in a way, validated this website with their browsing experience. The 19 aspects asked in the questionnaire (as in Appendix A) are listed in Table 5.13. The survey results provide the statistical percentages that show positive comments on the CBWR website.

Table 5.13

The aspects considered in the survey

No	Aspect
1	Please rate our website on the overall content.
2	Please rate our website on the ease of navigation.
3	Please rate our website on overall look.
4	The vocabulary on our website is appropriate for the intended audience.
5	The illustrations are appropriate.
6	The text is clearly written and easy to understand.
7	There are no grammatical or spelling errors.
8	The information on our website is accurate.
9	The information is timely and up-to-date.
10	The information is sufficient for the intended audience.
11	The organization of the site is logical and clear.
12	The user can clearly see where he/she is on the site.
13	The user can easily move through the site to a desired location.
14	The style is consistent throughout the site.
15	Links are current and working.
16	The background colors are pleasing.
17	Visuals enhance rather than reduce the message of the site.
18	The size of the text is easy to read.
19	The site is attractive

Source: (Ovretveit, 2001)

5.6.2.1 Profile of Respondents

In Figure 5.34, the bar chart shows the number of respondents and countries that they are originally from. Most of the respondents from the total of 100 are locals, i.e., from Malaysia with 34%, followed by China 24%, Bangladesh 11%, Jordan 9%, Thailand 8%, Algeria 8%, Yemen 8%, Pakistan 2% and Iraq 2%. In addition, the respondents were randomly selected from the community in the university.

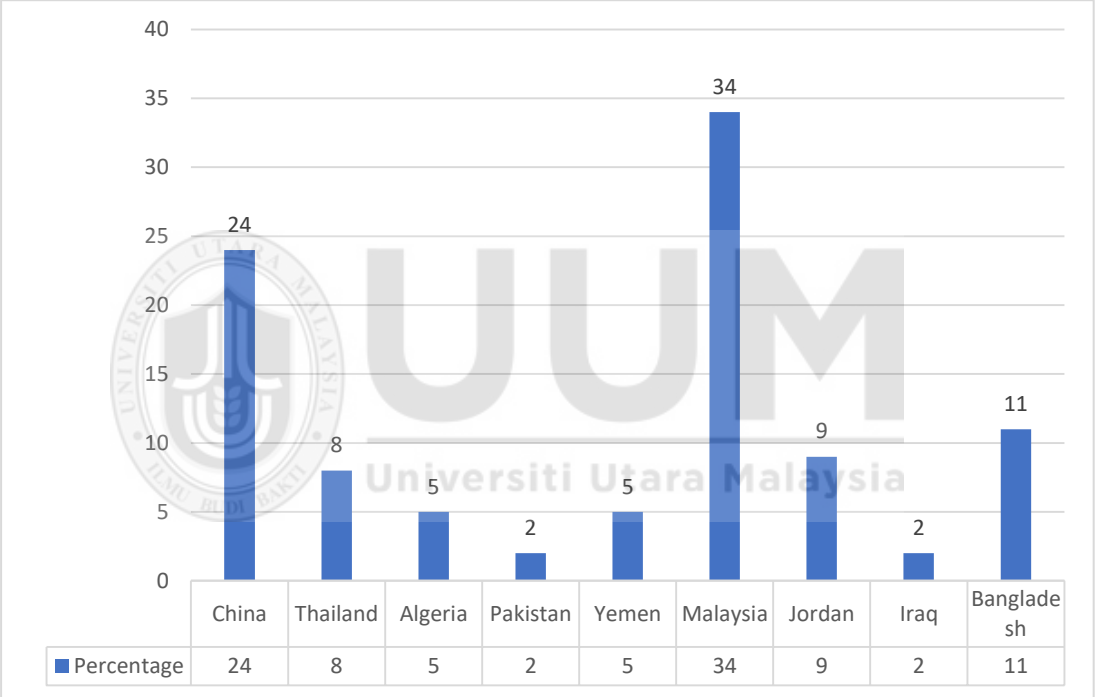

Figure 5.34. Bar chart of the respondents for CBWR website assessment

5.6.2.2 Analysis of CBWR Website

This section presents the result of the survey conducted on the 100 respondents over the 19 aspects of CBWR website. The results are expressed in the percentage form and are discussed in detail as follows:

Table 5.14

The frequency for each aspect of CBWR website assessment

Aspect	Frequency						
	Strongly agree	**Somewhat disagree**	**Disagree**	**No opinion /neutral**	**Agree**	**Somewhat agree**	**Strongly agree**
Overall content	0	0	0	1	8	22	7
Navigation	0	0	0	2	9	14	13
Overall look	0	0	0	3	8	7	18
Vocabulary	0	0	0	2	9	11	16
Illustration	0	0	0	3	3	19	12
Text clarity	0	0	0	3	7	9	19
Grammar or spelling	0	0	1	1	11	8	17
Information accuracy	0	0	0	2	8	9	19
Good updates	0	0	0	0	13	14	11
Sufficient information	0	0	0	0	12	12	14
Logical information	0	0	0	1	11	12	14
User view	0	0	0	0	8	19	11
Finding location	0	0	0	0	10	18	10
Style	0	0	1	1	10	18	10
Links	0	0	0	1	7	14	16
Background color	0	0	0	0	3	19	16
Visual enhancement	0	0	0	0	9	18	11
Text size	0	0	0	1	8	19	10
Attractiveness	0	0	0	1	4	18	15

- **Overall Content**

Figure 5.35 shows the percentage of the respondents regarding the overall content assessment of the CBWR website. It reveals that the percentages from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents who agree is 21.1 percent, somewhat agree is 57.9 percent and strongly agree is 18.4 percent, respectively. Therefore, a total of 97.4 percent has given their positive opinion on the overall content of the CBWR website.

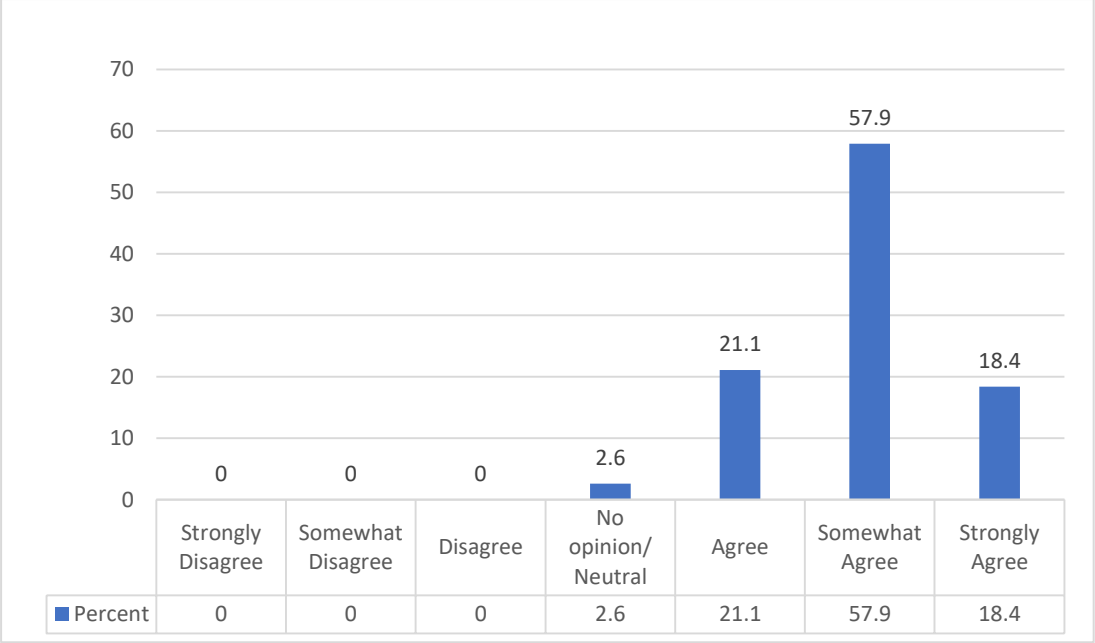

Figure 5.35. The percentage of the respondents regarding the overall content

- **Navigation**

Figure 5.36 shows the percentage of the respondents regarding the navigation assessment of the CBWR website. It reveals that the percentages from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 5.3 percent, agree is 23.7 percent, somewhat agree is 36.8 percent and strongly agree is 34.2 percent. Therefore, a total of 94.7 percent has given their positive opinion on the navigation of the CBWR website.

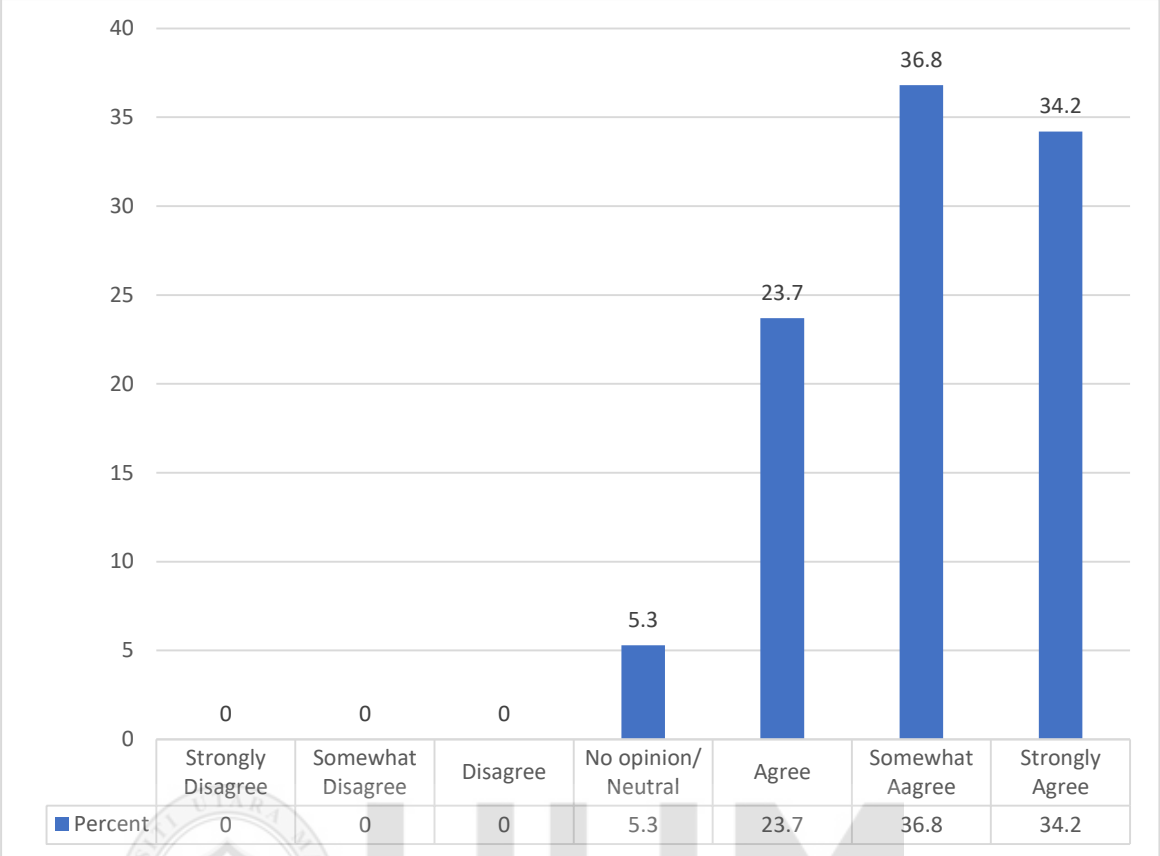

Figure 5.36. The percentage of the respondents regarding the navigation

- **Overall Look**

Figure 5.37 shows the percentage of the respondents regarding the overall look of the CBWR website. It reveals that the percentages from strongly disagree, somewhat disagree and disagree, at 0 percent. In addition, the Figure shows that respondents' response to neutral is 7.6 percent, agree is 27.7 percent, somewhat agree is 19.8 percent and strongly agree is 44.9 percent. Therefore, a total of 92.4 percent has given their positive opinion on the overall look of the CBWR website.

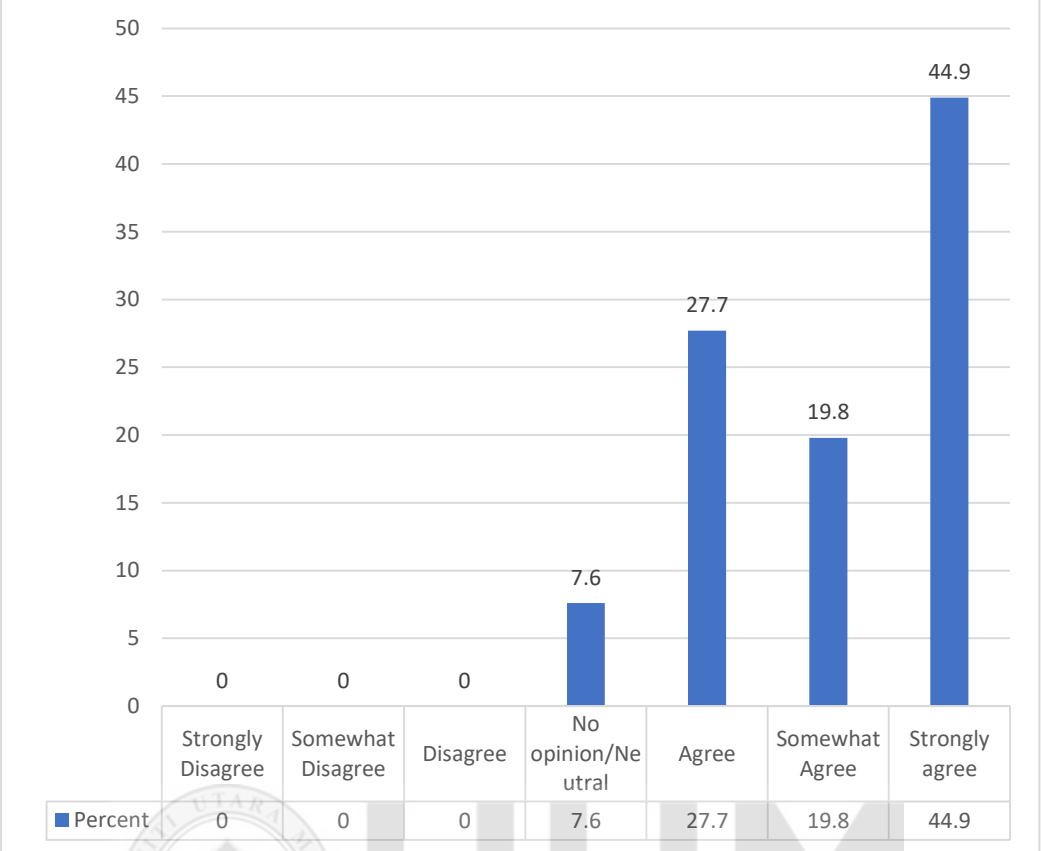

Figure 5.37. The percentage of the respondents regarding the overall look

- **Vocabulary**

Figure 5.38 shows the percentage of the respondents regarding the vocabulary used in the CBWR website. It reveals that the percentages from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents' response to neutral is 5.3 percent, agree is 27.3 percent, somewhat agree is 22.5 percent and strongly agree is 44.7 percent. Therefore, a total of 94.7 percent has given their positive opinion on the vocabulary used in the CBWR website.

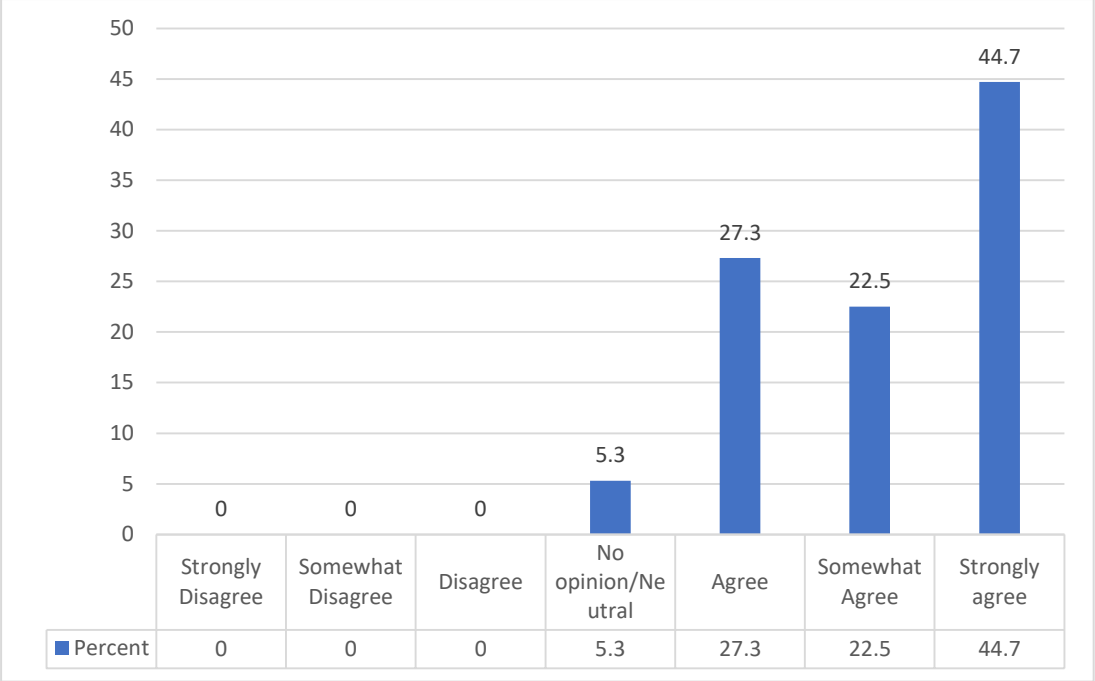

Figure 5.38. The percentage of the respondents regarding the vocabulary

- **Illustration**

Figure 5.39 shows the percentage of the respondents regarding the illustration in the CBWR website. It reveals that the percentages from strongly disagree, somewhat disagree and disagree, at 0 percent. In addition, the Figure shows that respondents' response to neutral is 7.9 percent, agree is 25.6 percent, somewhat agree is 23.7 percent and strongly agree is 42.6 percent. Therefore, a total of 92.1 percent has given their positive opinion on the illustration in the CBWR website.

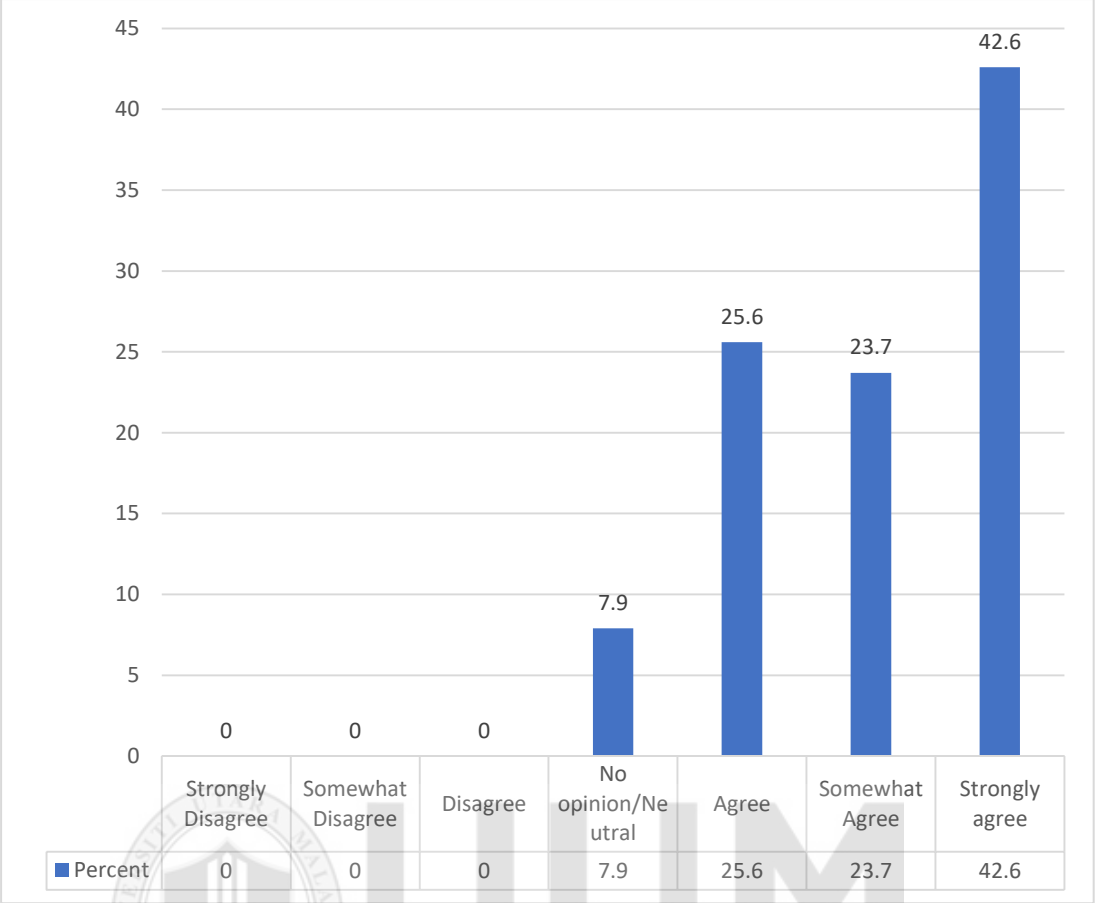

Figure 5.39. The percentage of the respondents regarding the illustration

- **Text Clarity**

Figure 5.40 shows the percentage of the respondents regarding the text clarity in the CBWR website. It reveals that the percentages from strongly disagree, somewhat disagree and disagree, at 0 percent. In addition, the Figure shows that respondents' response to neutral is 6.3 percent, agree is 22.6 percent, somewhat agree is 21.1 percent and strongly agree is 50 percent. Therefore, a total of 93.7 percent has given their positive opinion on the text clarity in the CBWR website.

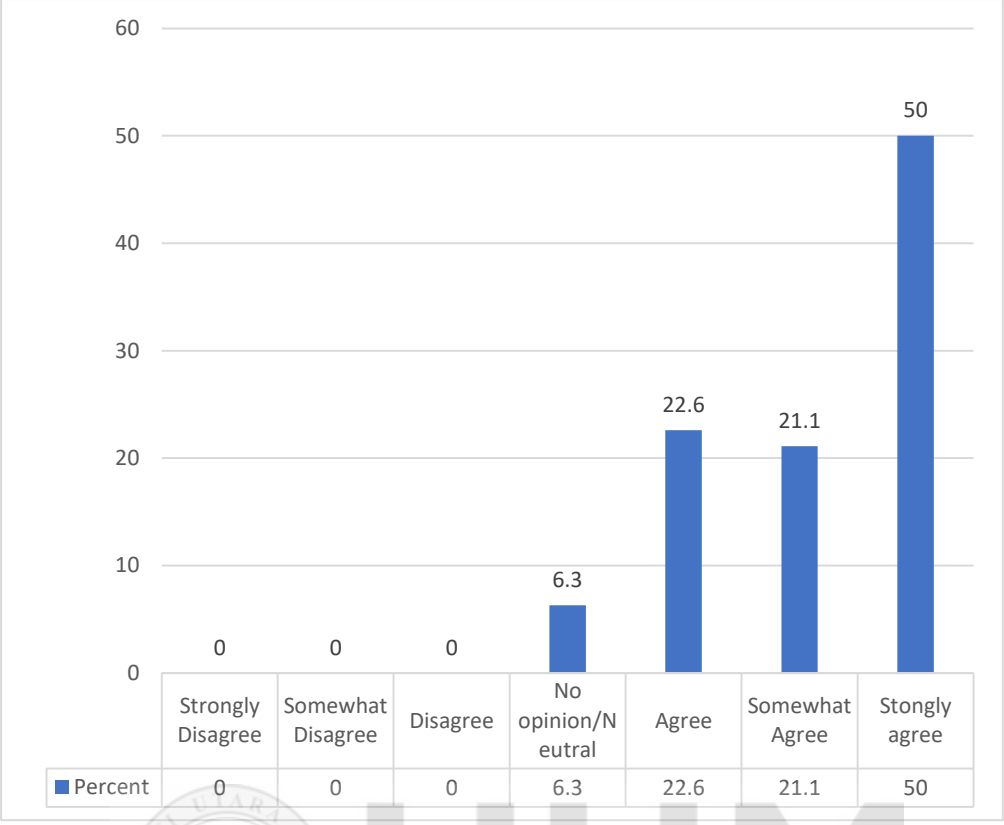

Figure 5.40. The percentage of the respondents regarding the text clarity

- **Grammar or spelling**

Figure 5.41 shows the percentage of the respondents regarding the grammar or spelling in the CBWR website. It reveals that the percentages from strongly disagree and somewhat disagree, at 0 percent, but disagree is 2.6 percent. In addition, the Figure shows that respondents‘ response to neutral is 2.6 percent, agree is 32.3 percent, somewhat agree is 23.7 percent and strongly agree is 39.5 percent. Therefore, a total of 94.8 percent has given their positive opinion on the grammar or spelling in the CBWR website.

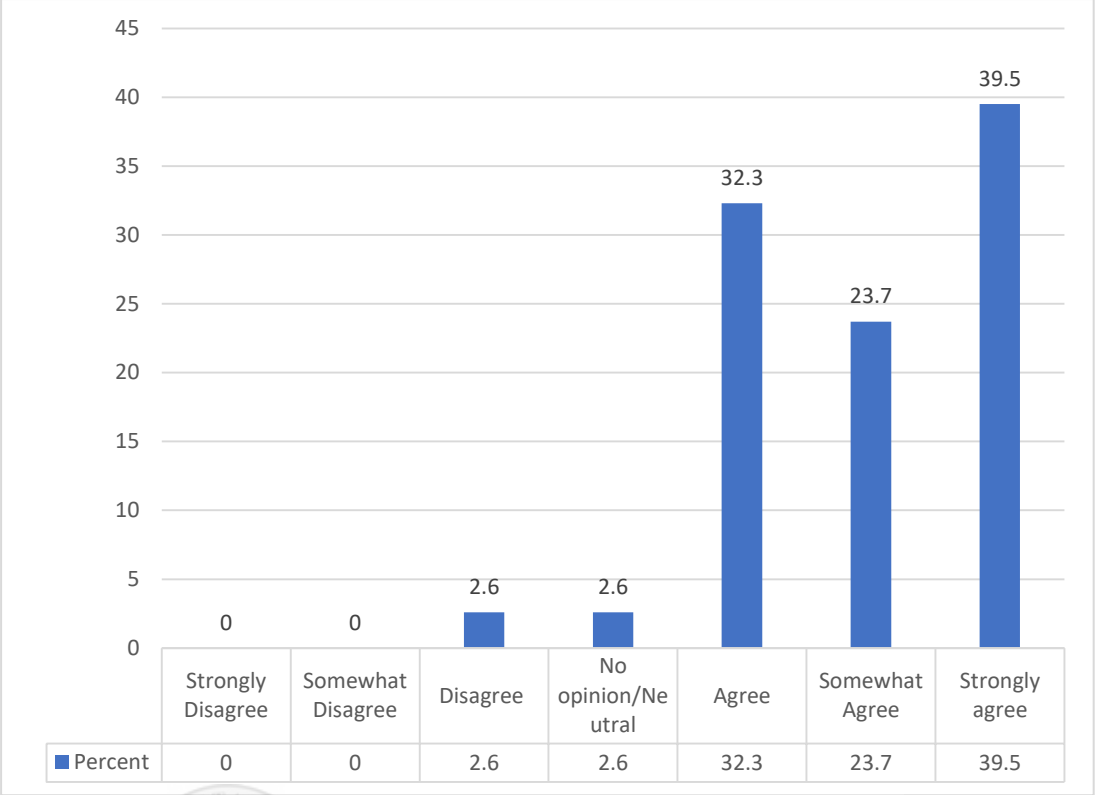

Figure 5.41. The percentage of the respondents regarding the grammar or spelling

- **Information Accuracy**

Figure 5.42 shows the percentage of the respondents regarding the information accuracy given in the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 3.7 percent, agree is 22.6 percent, somewhat agree is 21.1 percent and strongly agree is 52.6 percent. Therefore, a total of 96.3 percent has given their positive opinion on the information accuracy of the CBWR website.

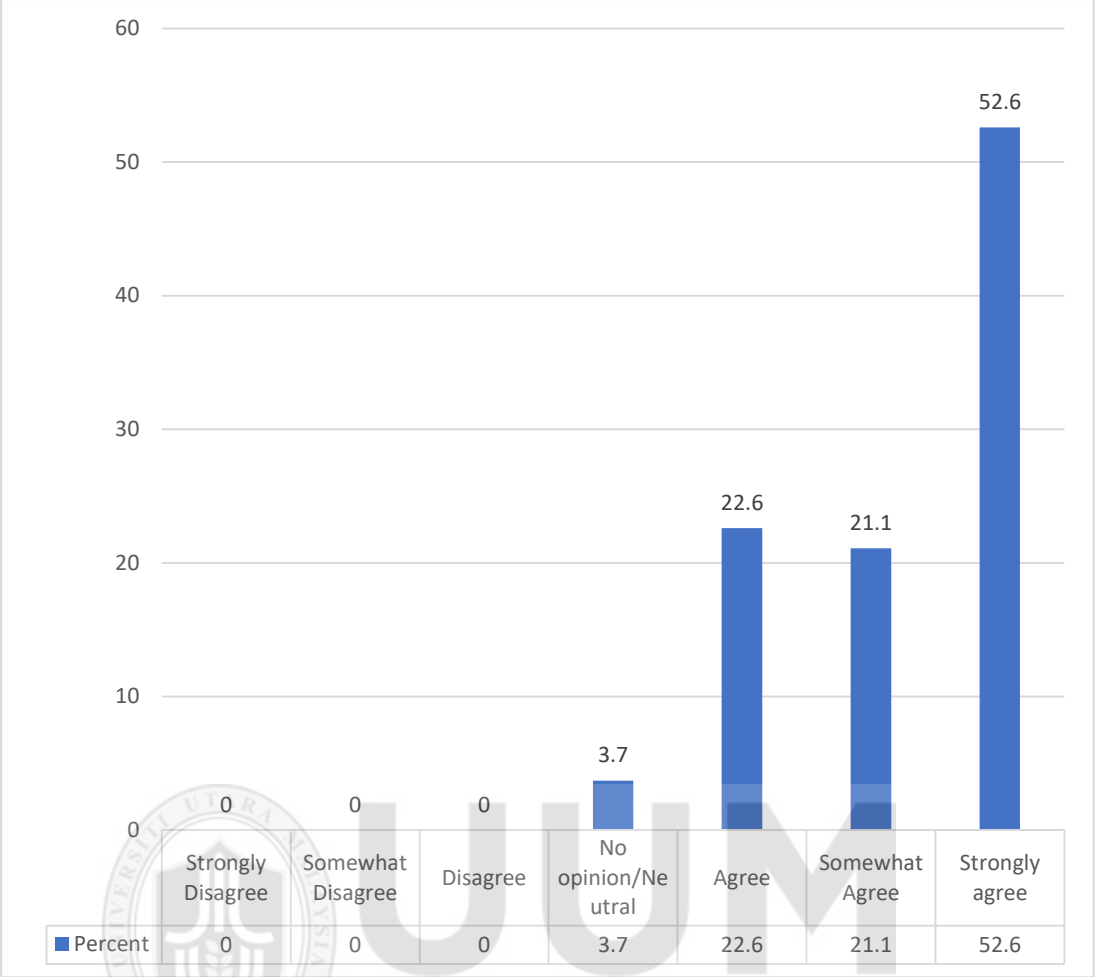

Figure 5.42. The percentage of the respondents regarding the information accuracy

- **Well Update**

Figure 5.43 shows the percentage of the respondents regarding the updates on the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 0 percent, agree is 39.5 percent, somewhat agree is 42.1 percent and strongly agree is 18.4 percent. Therefore, all respondents (100 percent) have given their positive opinion on the updates of the CBWR website.

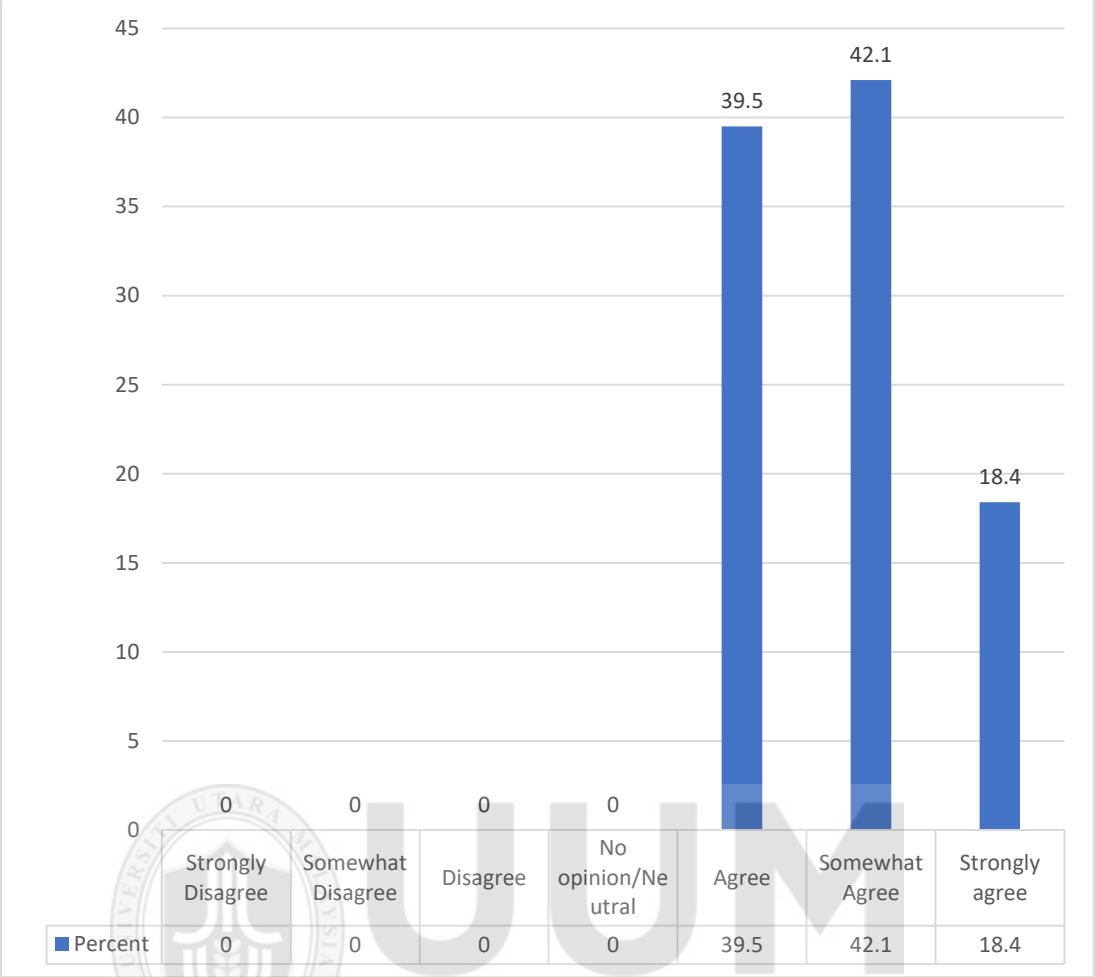

Figure 5.43. The percentage of the respondents regarding the updates

- **Sufficient Information**

Figure 5.44 shows the percentage of the respondents regarding the sufficient information assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 0 percent, agree is 31.6 percent, somewhat agree is 31.6 percent and strongly agree is 36.8 percent, respectively. Therefore, all respondents (100 percent) have given their positive opinion on the information being sufficient in the CBWR website.

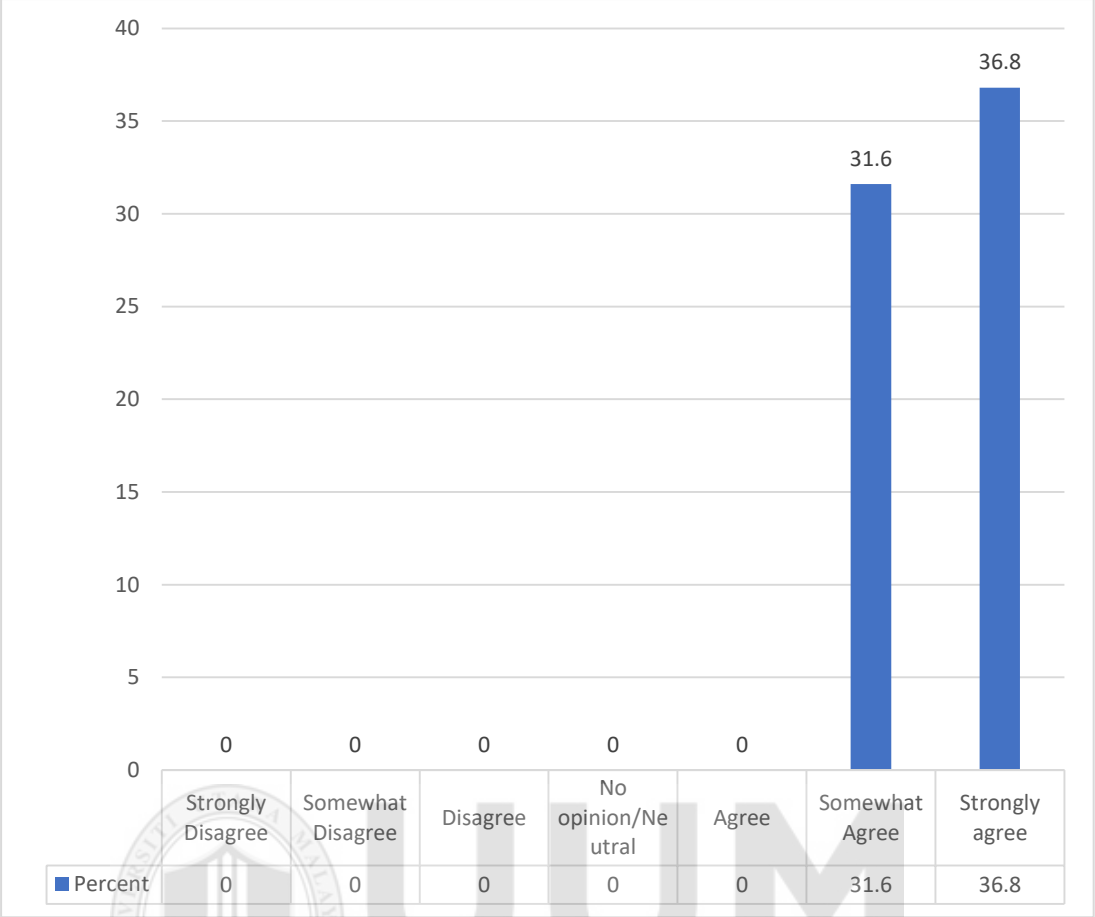

Figure 5.44. The percentage of the respondents regarding the sufficient information

- **Logical Information**

Figure 5.45 shows the percentage of the respondents regarding the logical information assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 5.3 percent, agree is 28.9 percent, somewhat agree is 34.2 percent and strongly agree is 36.8 percent. Therefore, a total of 94.7 percent has given their positive opinion on the logical information of the CBWR website.

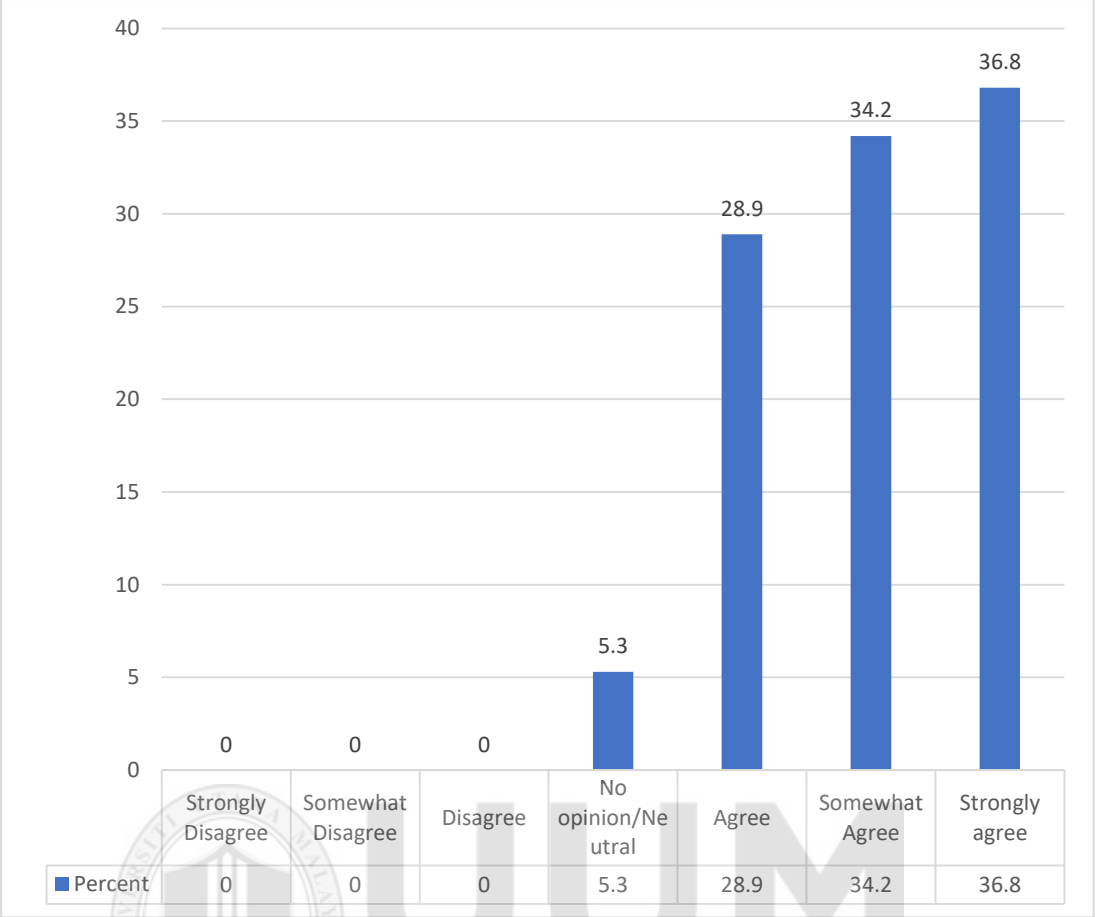

Figure 5.45. The percentage of the respondents regarding the logical information

- **User View**

Figure 5.46 shows the percentage of the respondents regarding the user view assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 0 percent, agree is 21.1 percent, somewhat agree is 50 percent and strongly agree is 28.9 percent. Therefore, all respondents (100 percent) have given their positive opinion on the user view of the CBWR website.

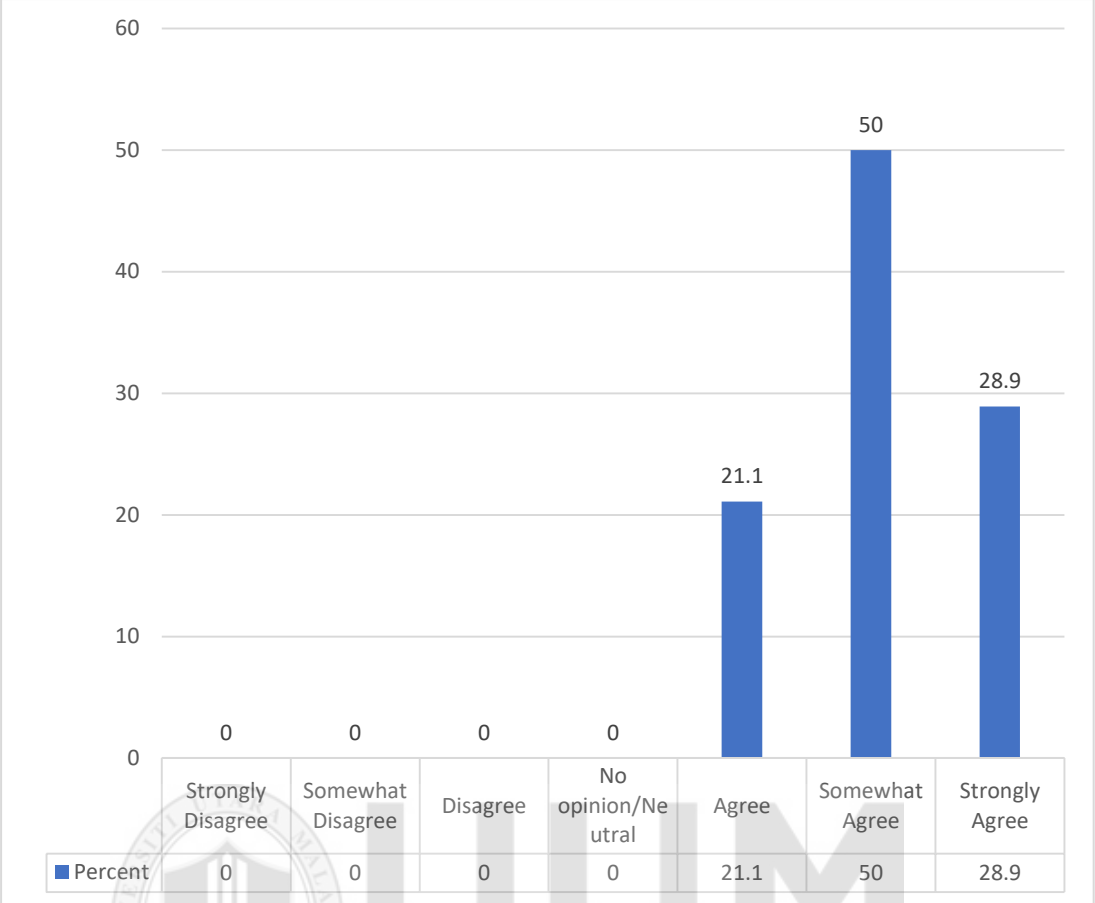

Figure 5.46. The percentage of the respondents regarding the user view

- **Finding Location**

Figure 5.47 shows the percentage of the respondents regarding the finding location assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 2.6 percent, agree is 26.3 percent, somewhat agree is 44.7 percent and strongly agree is 26.3 percent. Therefore, a total of 97.4 percent has given their positive opinion on the finding location of the CBWR website.

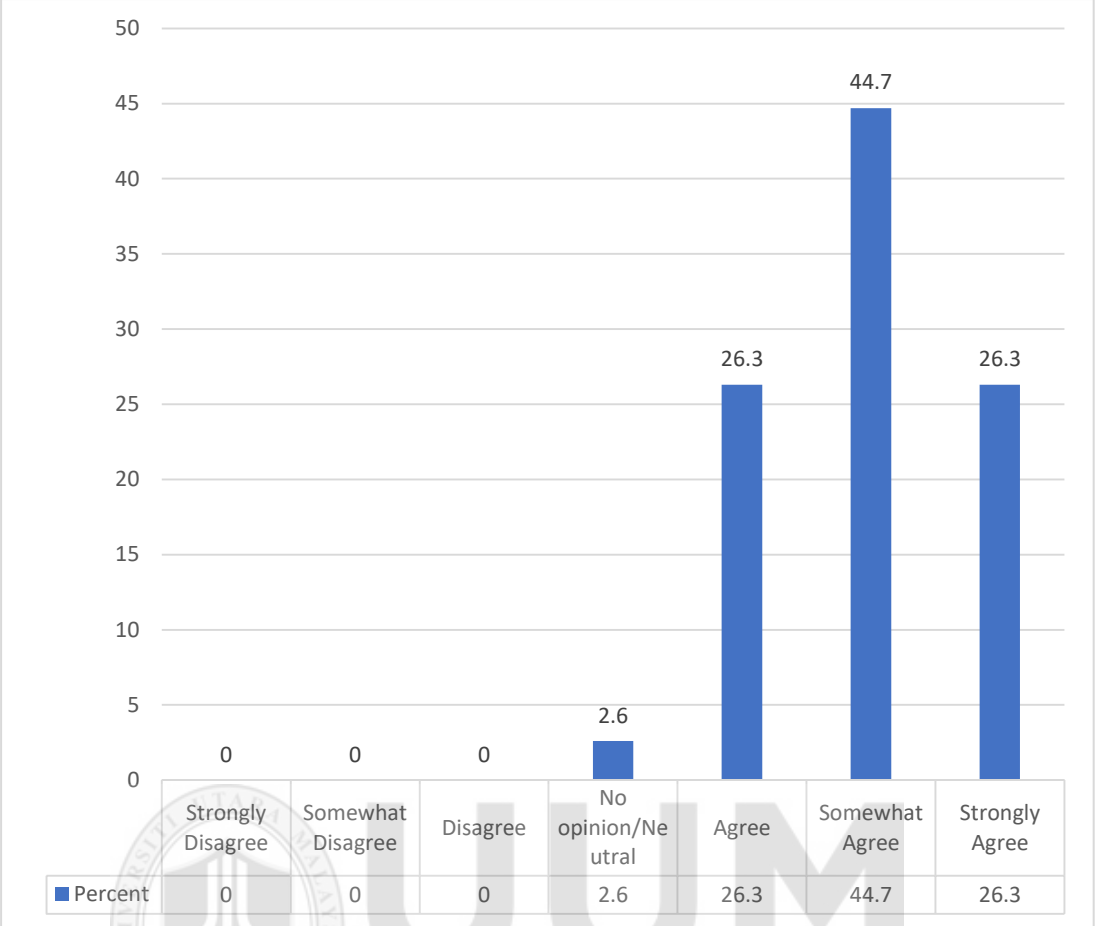

Figure 5.47. The percentage of the respondents regarding the finding location

- **Style**

Figure 5.48 shows the percentage of the respondents regarding the style assessment of the CBWR website. It reveals that the percentage varies from strongly disagree and somewhat disagree at 0 percent, but disagree is 2.6 percent. In addition, the Figure shows that respondents‘ response to neutral is 2.6 percent, agree is 21.1 percent, somewhat agree is 47.4 percent and strongly agree is 26.3 percent. Therefore, a total of 94.8 percent has given their positive opinion on the style of the CBWR website.

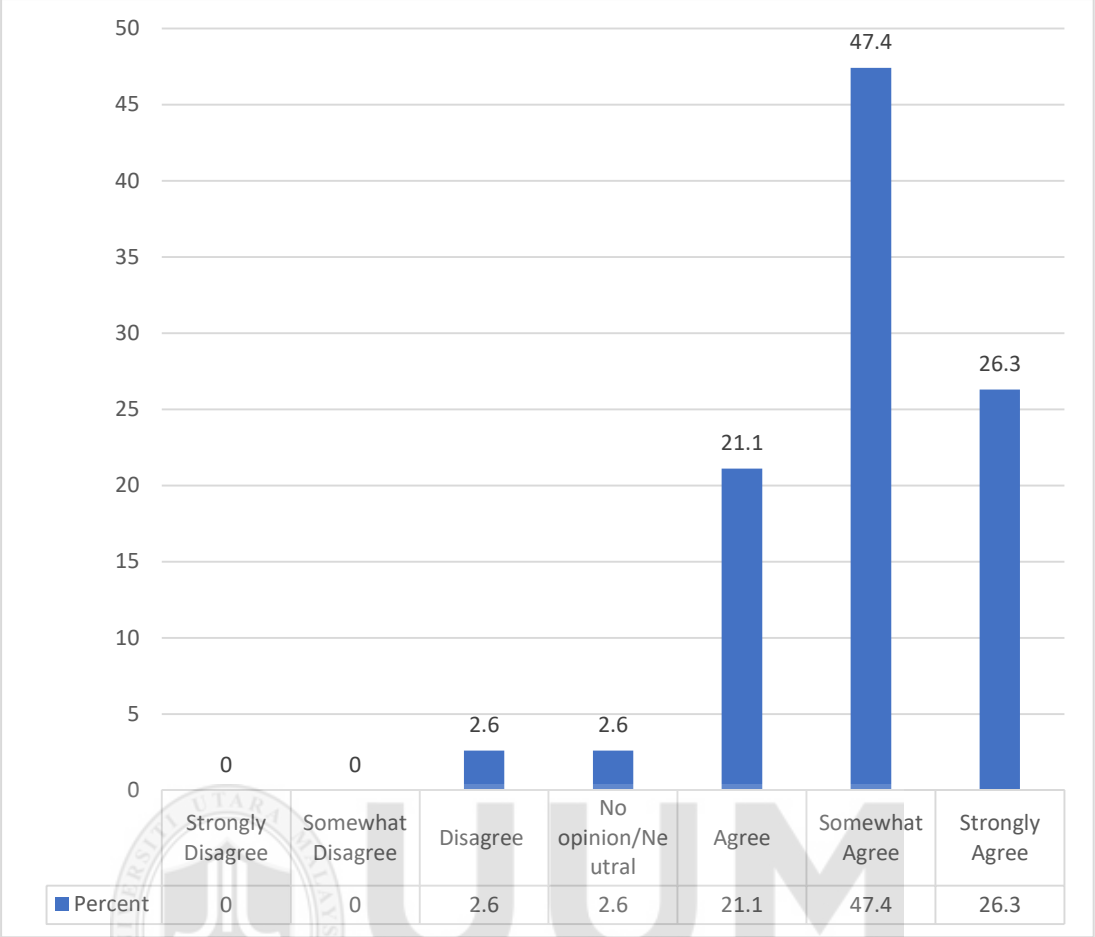

Figure 5.48. The percentage of the respondents regarding the style

- **Links**

Figure 5.49 shows the percentage of the respondents regarding the links assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 2.6 percent, agree is 13.2 percent, somewhat agree is 36.8 percent and strongly agree is 47.4 percent. Therefore, a total of 97.4 percent has given their positive opinion on the links in the CBWR website.

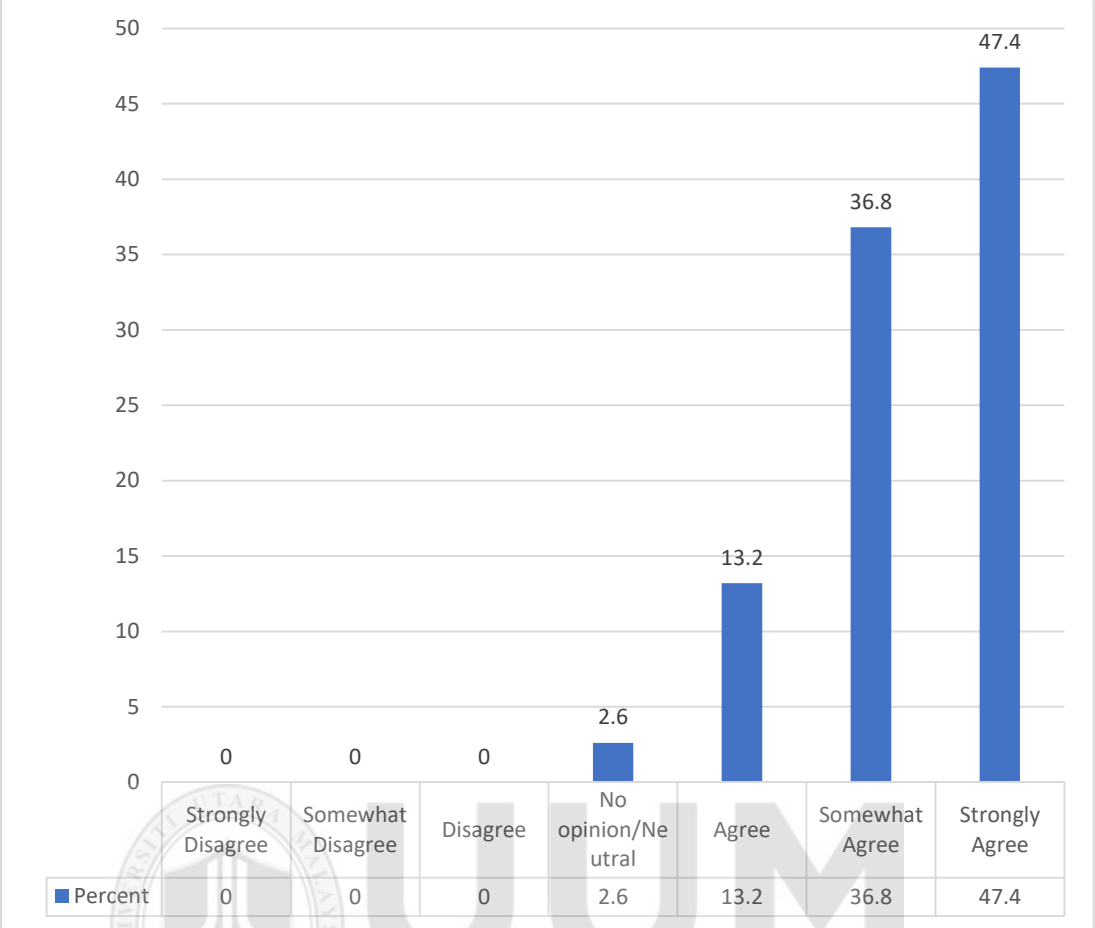

Figure 5.49. The percentage of the respondents regarding the links

- **Background Color**

Figure 5.50 shows the percentage of the respondents regarding the background color assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 0 percent, agree is 7.9 percent, somewhat agree is 55.3 percent and strongly agree is 36.8 percent. Therefore, all respondents (100 percent) have given their positive opinion on the background color of the CBWR website.

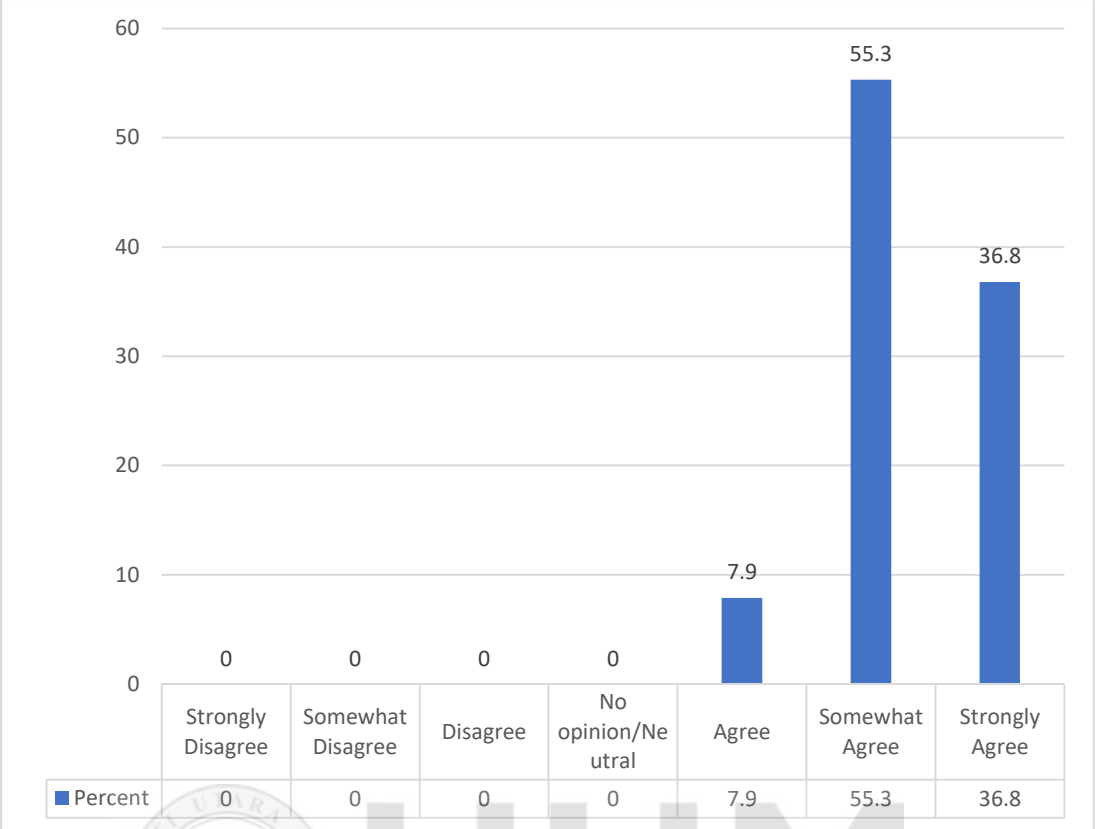

Figure 5.50. The percentage of the respondents regarding the background colour

- **Visual Enhancement**

Figure 5.51 shows the percentage of the respondents regarding the visual enhancement assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral in 0 percent, agree is 18.4 percent, somewhat agree is 55.3 percent and strongly agree is 26.3 percent. Therefore, all respondents (100 percent) have given their positive opinion on the visual enhancement of the CBWR website.

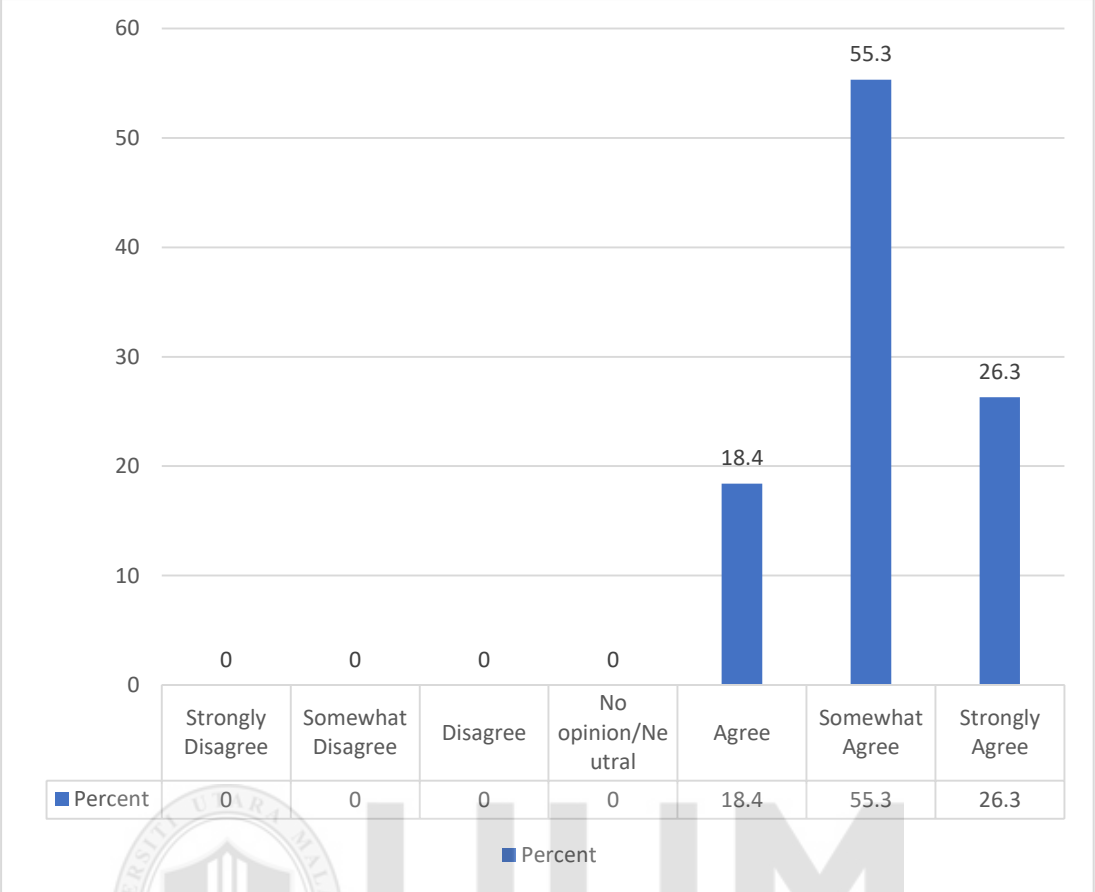

Figure 5.51. The percentage of the respondents regarding the visual enhancement

- **Text Size**

Figure 5.52 shows the percentage of the respondents regarding the text size assessment of the CBWR website. It reveals that the percentage varies from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 2.6 percent, agree is 15.8 percent, somewhat agree is 50 percent and strongly agree is 31.6 percent. Therefore, a total of 97.4 percent has given their positive opinion on the text size use in the CBWR website.

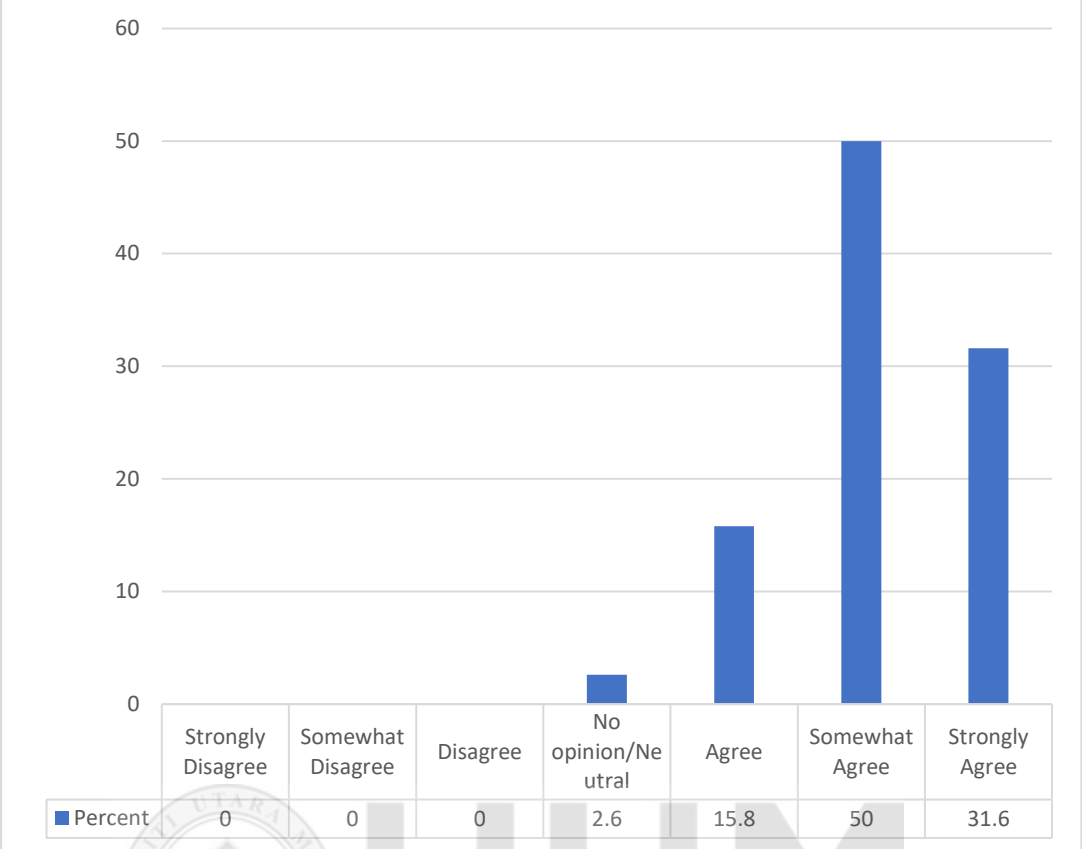

Figure 5.52. The percentage of the respondents regarding the text size

- **Attractiveness**

Figure 5.53 shows the percentage of the respondents regarding the attractiveness assessment of the CBWR website. It reveals that the percentages from strongly disagree, somewhat disagree and disagree at 0 percent. In addition, the Figure shows that respondents‘ response to neutral is 2.6 percent, agree is 7.9 percent, somewhat agree is 50 percent and strongly agree is 39.5 percent. Therefore, a total of 97.4 percent has given their positive opinion on the attractiveness of the CBWR website.

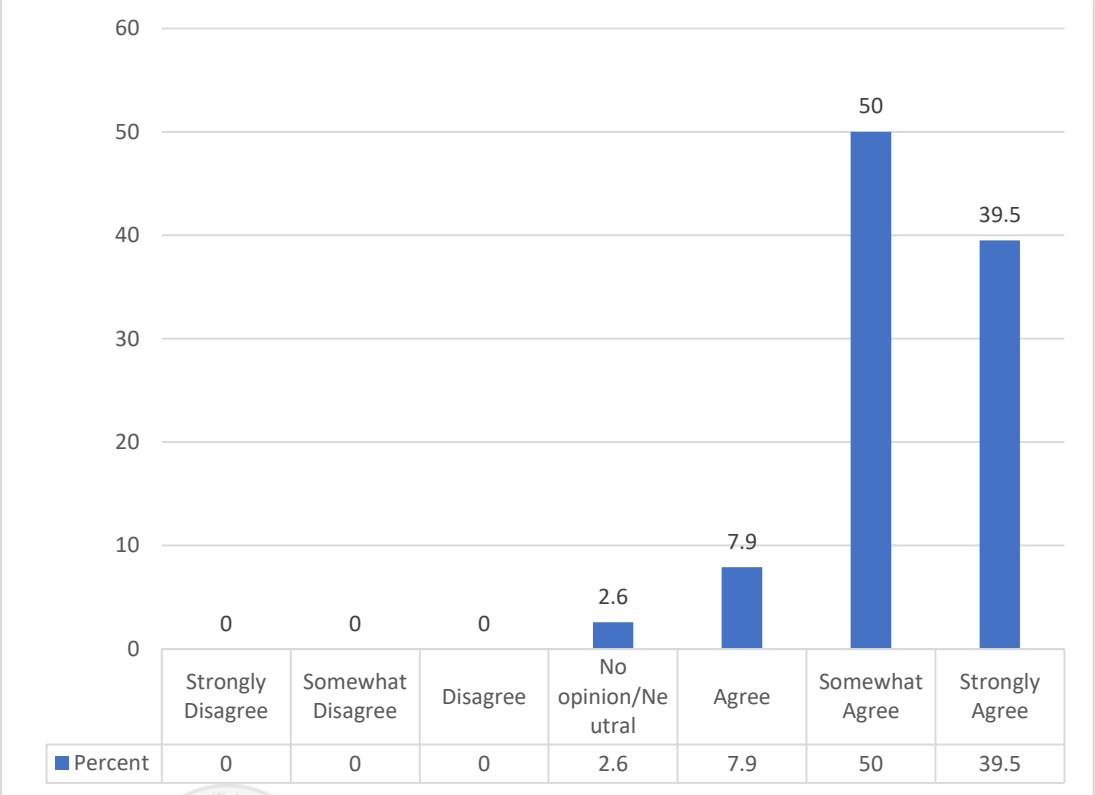

Figure 5.53. The percentage of the respondents regarding the attractiveness

5.6.3 Experts Validation

In doing face validity, the CBWR website was shown to three experts in UUM. The discussion on the CBWR website is based on seven queries as in Table 5.15.

Table 5.15

Queries for face validation

No	Queries
1	Comparing on the context
2	Appropriate context for the website
3	Correctness of grammar
4	The clarity and unambiguity of items
5	The correct spelling of words
6	The correct structuring of sentences
7	Appropriateness of font size and the structure of the instrument in terms of construction and well-thought out format

The three experts are from a related background. The first expert is a professor from the School of Computing. The second expert is an associate professor from Mathematics and Statistics Department, School of Quantitative Sciences (SQS). The third expert is a senior lecturer from the Decision Science Department in SQS. The discussion results are represented in Table 5.16

Table 5.16

The opinion for CBWR website based on expert judgement

Expert	Position	Opinion for CBWR website based on seven queries		Percentage	
		Yes	No	Yes	No
First	Professor	5 / 7	2 / 7	72%	28%
Second	Associate Professor	4 / 7	3 / 7	57%	43%
Third	Senior Lecturer	6 / 7	1 / 7	85%	15%
Kappa Value				>50%	

Kappa is a standard value that determines the validity of the percentages of the CBWR website based on expert judgment. If the percentage of inter-rater agreement yields more than 50%, then the judgment is positive (Azwani, Norain & Noor, 2016). Based on the seven queries as explained in Table 5.15, the first expert marked five out of seven queries with ‗yes' which is positive judgment on opinion which shows that 72% of the opinion given by the first expert is positive with only 28% being negative opinion. Similarly, the second expert marked 57% positive opinion against 43% negative opinion which is slightly more but still less than the positive judgment value. The third expert marked 85% positive opinion and only 15% negative opinion. These opinions are presented in Table 5.16. Overall, findings from the experts' opinion survey explain that the experts' judgment exceeds the threshold value of Kappa which

is greater than 50% (77% by the first expert, 57% by the second expert and 85% by the third expert). The study concludes that the validation through expert judgment or opinion is more positive in nature. The comparison percentage can be seen in Figure 5.54.

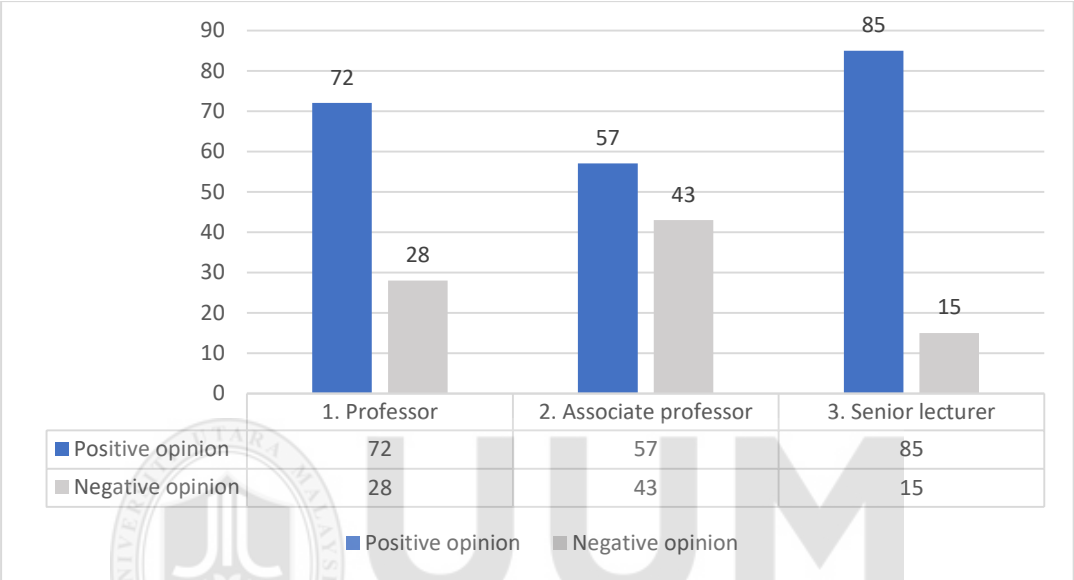

Figure 5.54. Bar chart of expert judgment on CBWR website

5.7 Results on Evaluation of the Website

The CBWR website was further evaluated by comparing it with an established and existing homestay website globally available, i.e., the British homestays. In the first step, the navigation of websites was compared. The website compared with the CBWR is based in the UK as shown in Figure 5.55. In addition, the CBWR website as in Figure 5.56 has Booking and Easy Search facility that is not highlighted in British Homestays. This CBWR website also provides clear contact details and alerts in the web address bar.

Figure 5.55. British Homestays

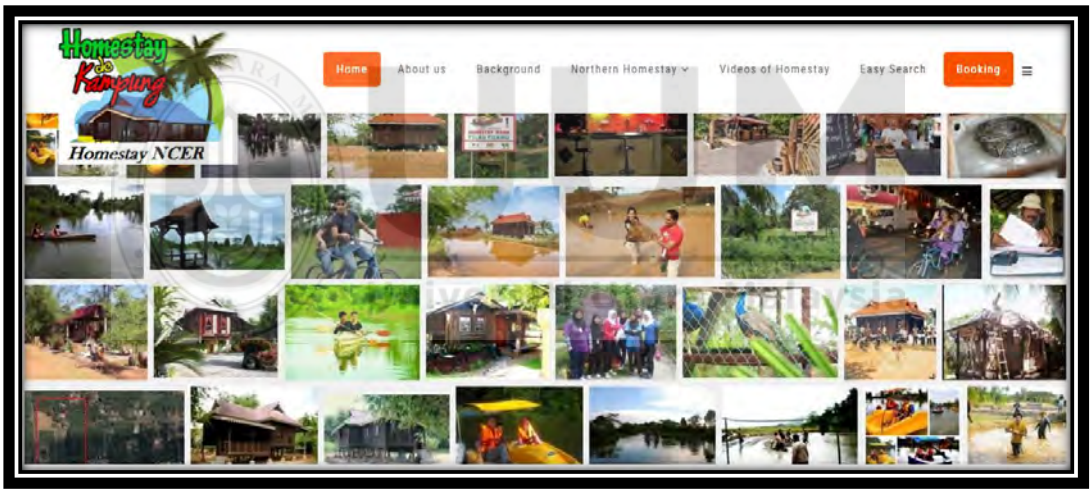

Figure 5.56. The CBWR website

Table 5.17

The comparison between British Homestay's and CBWR Websites

	Feature	British Homestay	CBWR Website
1	Navigation of the website	No	Yes
2	Booking and easy search facility is Highlighted	No	Yes
3	Clear contact detail	No	Yes

The integration between the CBWR system and the individual homestay websites has created a better and effective homestay website, which provides more information with multifunction and easy access for users as shown in Figure 5.57. These are evidenced in its multicolor and graphic presentations. In addition, it provides various image representations in a web portal.

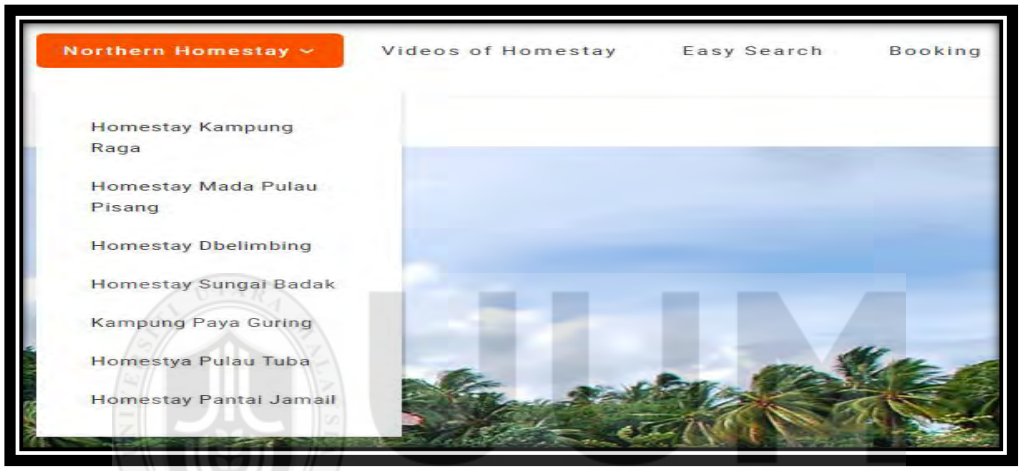

Figure 5.57. The multifunction of the CBWR website

The CBWR system provides users with website recommendations which helps users to have easy access to other homestay websites. Further, the system provides the rating and ranking of the homestay recommended website based on the frequency of the websites being accessed as shown in Figure 5.58.

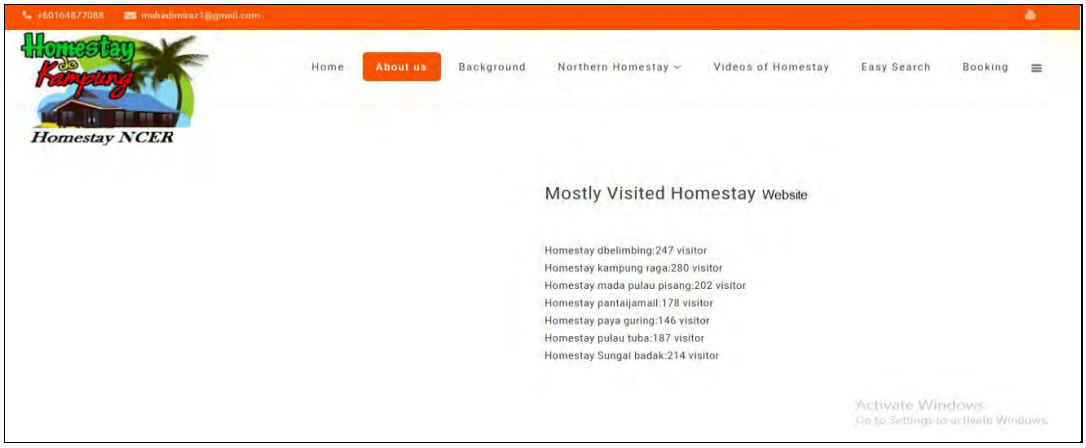

Figure 5.58. The CBWR website user ranking

In addition, those individual homestay websites are integrated with the new and effective promotional tool, i.e., the CBWR system. This is a unique effort which can be seen in Figure 5.59. Conclusively, it can be said that this study's CBWR website is comparable to other similar commercial homestay websites available.

Figure 5.59. The CBWR website tools

5.8 Summary

The CBWR website possesses better graphical user interface (GUI) and personalized content in order to make it easier for web user navigation. This CBWR website is a multifunctional system, tightly integrated with the WampServer. It is based on an incremental procedure that is able to update incrementally and automatically the knowledge obtained from historical usage data and to generate a list of links to pages that are of potential interest to the users. The CBWR system provides the rating and ranking of the homestay based on the frequency of the website being accessed. This new CBWR website is well-balanced and able to fulfill the research objectives. The CBWR website can be considered as a new recommender tool and also an effective promotional tool for Malaysian HPs.

As a conclusion, the integration between the CBWR system and the individual homestay websites has created a relatively better and effective approach or comparable for promoting and marketing homestay websites globally. This can be seen in the subjective comparisons of certain feature as in table 5.17.

CHAPTER SIX

CONCLUSION AND FUTURE WORK

In this chapter, a summary of the study, its implications, limitations and how future work might be potentially conducted are provided.

6.1 Summary of the Study

A CBT effort specifically targeting to improve the livelihood of the Malaysian communities in the rural areas is studied in this research. Through the initiative of the Malaysian government, many HPs have been established around the country with the intention to attract local and foreign visitors. However, it can be generally seen that not many significant changes have taken place since the inception of the novel idea some 40 years ago. Although the current trend reflects that ICT plays a very important role in promoting and marketing the homestay business initiative, the homestay operators are not catching up with the use of technology to promote their HPs globally. More visitors mean more side income for the communities. Therefore, in this thesis, an alternative approach of promoting the HPs through the use of an emerging technology is introduced.

Hence, the main objective of this research is to develop a collaborative-based web recommender (CBWR) model or system to solve the Malaysian HPs‘ promotion agenda in reaching global tourists. This CBWR is a type of CMS to support e-tourism promotional activities. Practically, this research presents a functional CBWR website for the selected HPs in the NCER of Malaysia.

First, this thesis attempted to review some of the earlier works related to existing conventional homestay promotion tools. Subsequently, the criteria for an effective website were reviewed, as well as requirements and attributes deemed necessary for the development of the proposed CBWR website as shown as Figure 3.1 and Table 3.3. These reviews support the accomplishment of the first objective as stated in section 1.8.1.

The methodology used in the research is the CBWR approach, as explained in Chapter Four. This CBWR website or system consists of a unique algorithm for the development of the various relevant web pages. The whole development process is explained in sections 4.4 and 5.4 which fulfil the second sub-objective as stated in section 1.8.2. Therefore, the CBWR system supports the business initiative of HPs and fulfills the main objective of this research as in section 1.8.

The implementations were tested on a real working website at www.homestaykedah.com. The CBWR website was validated in two processes as explained in sections 4.7 and 5.5. The validation and evaluation were necessary to further determine the effectiveness and suitability of the proposed CBWR website. In this regard, the validation and evaluation of the website in the realm of HPs fulfills the final sub-objective as stated in section 1.8.3.

In the following subsections, the implications and the limitations of this thesis are provided.

6.2 Implications of the Research

In this section, the implications or contributions of this research from various relevant aspects are explained.

6.2.1 Implication to the Body of Knowledge

This research contributes to a new and unique website that embeds a collaborative-based recommender algorithm, which can be implemented online in real time, which is similar to the work done by Logesh and Subramaniyaswamy (2016). It is called the collaborative-based web recommender (CBWR) system with the integration of use view and CiteULike functions. The CBWR system or website serves users in the exact real time basis, where users can browse and select the available individual websites to know more about their signature products and activities.

6.2.2 Implication to Potential Tourists

The CBWR website provides an attractive and high-quality gateway for users, who are potential tourists from around the world. Tourists normally would want to find unique product offerings and accommodations that suit their interests. In this regard, the CBWR website can provide and recommend the best suitable choices to users through WR (web recommender) functions.

6.2.3 Implication to the Policymakers

The establishment of this CBWR website that promotes some of the HPs in the NCER can increase tourist spending, thus increasing the local business activities. This in turn can improve the livelihood of the communities involved. This CBT is the goal of the MOTAC of Malaysia. MOTAC may use this effort as benchmark to assess its support to the communities. As the marketing arm of MOTAC, Tourism Malaysia may use the results and analysis from the CBWR website to promote the Malaysian HPs in their promotional events. The CBWR may assist the government and economy through developing the rural culture, society, and lifestyles.

6.2.4 Implication to the Rural Communities

The CBWR website promotes the rural homestay business initiatives and activities. In the digitalized world today, the technology-based promotion strategy is expected to connect to wider global tourists, thus bringing more tourism-related economy to the rural communities. In addition, this CBWR website helps make the homestay operations easy and more efficient.

6.3 Limitations

Although the CBWR system or website has many strong points, there are still some limitations that should be taken into consideration. In the initial stage of the research, some basic information on effectiveness of a website mainly from the literature and existing real commercial websites was gathered. However, there is a possibility that there might be other factors or criteria that can be taken into consideration to produce a more effective website.

The development of this CBWR website should consider other requirements relevant to e-commerce if it is to be on par with a complete website. However, some of the requirements are complex and need detailed planning to do so.

In relation to evaluation of the CBWR website, the researcher was not able to consult with the respective homestay operators. Furthermore, there could be other suitable ways or approaches to evaluate the CBWR model as compared to what was done in this study.

This research does present some interesting ideas for the improvement of the CBWR website. However, much effort and work still need to be done before the prototype can be applied in its real environment, such as collaborative-based virtual recommender system (CBVRS).

6.4 Future Work

Subsequently, deep thoughts should be given to overcome these limitations through future works. Among others, future work could include enhancements in the algorithm and improvements in its performance.

It would be wise if a survey on users‘ preferences and relevant experiments are carried out among potential tourists to HPs in the NCER in order to obtain other criteria deemed important. The ideas from different users may bring about a more effective and realistic CBWR website.

The evaluation process used in this research could be verified in the future for better improvement. Further improvement on the evaluation to the system can be made, such as considering multidimensional criteria for the evaluation.

In future, this CBWR system or website can be enhanced to implement the portotype of a collaborative-based virtual website (CBVW) which should include the virtual facility. This technique is one of the potential techniques, among others. Possibly, this CBWR system can be also combined with the CBVRS to provide a stable system at a commercial standard and as a support to the e-commerce and e-tourism industries simultaneously.

REFERENCES

Amin, A., & Ibrahim, Y. (2016). Sustainable community participation in homestay program. *International Business Management, 10*(1), 18-23.

Abu-Hassan, M., & Omar, S. Z. (2009). My Malaysia. *Digital review of 2009–2010 Asia Pacific (*pp. 255-261*).*

Adomavicius, R., Sankaranarayanan, S. S., & Tuzhilin, A. (2005). Incorporating contextual information in recommender systems using a multidimensional approach. *ACM Trans. Information Systems, 23*(1), 103–145.

Afolabi, A. O., & Ajayi, A. O. (2008). Performance evaluation of database management system: A case study of interface and MySQL. *Journal of Engineering and Applied Sciences, 3*(*2*)*, 155-160.*

Alan., S. (2013). Evaluating the Accuracy and Utility of Recommender Systems. Von der Fakulty of Elektrotechnik und Informatik – der Technischen Universit Berlin, (pp. 1-160).

Albiol-Pérez, S., Gil-Gómez, J.A., Lloréns, R., Alcañiz, M., Font, C.C. (2014). The role of virtual motor rehabilitation: A quantitative analysis between acute and chronic patients with acquired brain injury. *IEEE J. Biomed, Health Inform*, (pp. 391–398).

Albaladejo-Pina, I. P., & Díaz-Delfa, M. T. (2009). Tourist preferences for rural house stays: evidence from discrete choice modelling in Spain. *Tourism Management, 30*(6)*,* 805-811.

Alves, H.M., Bcerro, A.M.C. & Martins, A.V.F. (2010). Impacts of small tourism events on rural places. *Journal of Place Management and Development, 3*(2), 22-37.

Alam, S. (2009). Adoption of internet in Malaysian SMEs. *Journal of Small Business & Enterprise Development, 16*(2), 240-255.

Amin, A., & Ibrahim, Y. (2015). Model of sustainable community participation in homestay program. *International Business Management, 6*(3), 539-545.

Ayob, N. M, & Masron, T. (2014). Issues of Safety and Security: New Challenging to Malaysia Tourism Industry. SHS Web of Conferences, published by EDP Sciences. Retrieved from http://www.shs-conferences.org/articles/shsconf/pdf/2014/09/shsconf *4ictr2014_01083.pdf.*

Ashley, C., Roe, D., & Goodwin, H. (2001). Pro-Poor Tourism Strategies: Making tourism work for the poor. *Overseas Development Institute, London. Nottingham: Russell Press.*

Avishay, L., Vivek, G., Jaime, T., Susan T. D., & Eytan, A. (2014). CiteSight: Supporting Contextual Citation Recommendation Using Differential Search. *SIGIR*, (pp. 1-10). Retrieve from http://www.cond.org/citesight.pdf

Azwani, M., Norain, M.T., & Noor, S.S. (2016). Evaluating the face and content validity of a Teaching and Learning Guiding Principles Instrument (TLGPI): A perspective study of Malaysian teacher educators. *Malaysian Journal of Society and Space, 12*(3), 11 – 21.

Balabanovic, M., & Shoham, Y. (2010). Content-Based, collaborative recommendation. *Communications of ACM, 40 (3), 66-72.*

Balasubramanian, R. (2010). Oxidation of methane by a biological dicopper centre. *Nature,* 465, 115-119.

Baeza-Yates, R., & Castillo, C. (2005). Characterization of national web domains. *Technical report, Universitat Pompeu Fabra.*

Baca, B., & Cassidy, A. (1999). Intranet development and design that works. *In Human Factors and Ergonomics Society Annual Meeting,* (pp. 777-790).

Balabanovic, M. and Shoham. (1997). *Y. Fab:* Content-Based, collaborative recommendation*. Communications of ACM, 40*(3), 66-72.

Barnes, J., & Coatney, K. (2014). Regional economic development and marketing rural tourism events using facebook: The Woodville Deer and Wildlife Case. *Mississippi State University Extension,* (pp. 28-55).

Becken, S., & Gnoth, J. (2004). Tourist consumption systems among overseas visitors: reportingon American, German, & Australian visitors to Newzeland. *Tourism Management, 25*(3), 375-385.

Beerli, A., & Martín, J. D. (2004). Tourists Characteristics & the perceived image of tourist destinations: A quantitative analysis- a case study of lanzarote, Spain. *Tourism Management,* 25, 623-636.

Bhaumik, R.., Williams, C., Mobasher, B., & Burke, R. (2006). Securing collaborative filtering against malicious attacks through anomaly detection*. Tthe 4th Workshop on Intelligent Techniques for Web Personalization,* Boston.

Bhuiyan, M. A. H., Siwar, C., & Ismail, S. M. (2013). Tourism development in Malaysia from the perspective of development plans. *Asian Social Science,* Asian Social Science, *9*(9), 11-18.

Bierzynski, A. (2011). Destination branding and first impressions an analysis of Grenada_s *Tourism Promotion, Degree of Masters of Arts in Public Communication,* America University: Washington D.C.

Billsus, D., & Pazzani, M. (1998). Learning collaborative information filters. *International conference on machine learning. Morgan Kaufmann Publishers, Burlington, Massachusetts.*

Brohman J. (1996). New directions in tourism for third world development. *Annals of Tourism Research, 23* (1)*, 48-70.*

Briedenhann, J., & Wickens, E. (2004). Tourism routes as a tool for the economic development of rural areas - vibrant hope or impossible dream. *Tourism Management,* 25, 71-79.

Buhmann, M.D. (2001). Approximation and interpolation with radial functions. multivariate approximation & applications. UK: Cambridge University Press.

Burke, R. (2000). Knowledge-Based recommender systems. *Encyclopedia of Library & Information Systems, Marcel Dekker, 69* (*32*), *1-23.*

Burke, R., Mobasher, B., Bhaumik, R., & Williams, C. (2005). Segment-based injection attacks against collaborative filtering recommender systems. *International Conference on Data Mining*, Houston, Texas, (pp. 577-580).

Burke, R. (2004). Hybrid recommender systems with case-based components. *In proceedings of European Conference on Case-Based Reasoning 2004*. USA: Springer, (pp. 91-105).

Burke, R. (2002). Hybrid recommender systems: survey & experiments. *User Modeling & User-Adapted Interaction. 12*(4), 331-370.

Burnett, P. C. (2001). Elementary student's preferences for teacher praise. *Journal of Classroom Interaction, 36*(1), 16-23.

Busby, G., & Rendle, S. (1999). Transition from tourism on farms to farm tourism. *Tourism Management,* 21, 635-642.

Chaffey, C. E. (2014). Review of wasted world: how our consumption challenges the planet. Chicago: University of Chicago Press.

Chien, Y.H. and George, E.I. (1999). Bayesian collaborative filtering, artificial intelligence and statistics, Morgan Kaufmann, (187-192).

Cheung V.G., Conlin L.K., Weber T.M., Arcaro M., Jen K.-Y., Morley M., & Spielman R.S. (2003). Natural variation in human gene expression assessed in lymphoblastoid cells. *Nat. Genet*, 33, 422-429.

Chen, L., & Sycara, K. (1997). Web mate, a personal agent for browsing and searching, How the Internet Came to Be, as told to Bernard Aboba. *The Robotics Institute Carnegie Mellon University Cerf, Vinton* (pp 1-16). Retrieved form http://www.ri.cmu.edu/pub_files/pub1/chen_liren_1998_1/chen_liren_1998_1.pdf.

Cohen-Schapire, W.W., & Singer, Y. (1999). Learning to order things. *Journal of Artificial Intelligence Research*, 10, 243-270.

Crompton, J.L. (1979). Motivations for pleasure vacation. *Annals of Tourism Research, 6*(4), 408-424.

Chen., L., & Feng, W. (2013). Preference-based clustering reviews for augmenting e-commerce recommendation. *Knowledge-Based Systems*, (pp. 44-59).

Das, A. S., Datar, M., Garg, A., & Rajaram, S. (2007). Google news personalization: scalable online collaborative filtering. *In Proceedings of the 16th international conference on World Wide Web,* (pp. 271–280).

Dalvi, M., & Gumaste, S.V. (2015). Collaborative filtering. *International Research Journal of Engineering and Technology, 2*(9), 900-904.

Debashis, D., Laxman, S., & Sujoy, D. (2017). A Survey on Recommendation System. *International Journal of Computer Applications, 7*(160), 0975 – 8887).

Demirtas, M. (2012). An Analysıs In Purpose to the Facebook and Twitter Users in Turkey. *British Journal of Arts and Social Sciences, 9*(2), 116-125.

Diao, Q., Qiu, M., Wu, C.Y., Smola, A.J., J. Jiang, J., & Wang C. (2014) Jointly modeling aspects, ratings and sentiments for movie recommendation (JMARS). In KDD, ACM, (pp-193–202).

Douglas, C. (2006). The internet book. *Prentice Hall,* p. 64.

Dong, A. X., Halevy, J., Madhavan, E.N., & Zhang, J. (2004). Similarity search for web services. *In Proceedings of the 30th international conference on Very large data bases, 30*(4), 372–383.

Deepa, M., & Govind., S. P. (2016). A Review on Content Based Recommendation System. *International Journal of Innovative Research in Computer and Communication Engineering*, *4*(11), 20473-20479.

Dumas, M., Garcia-banuelos, L., & Dijkman, R. (2009) Similarity search of business process models. *IEEE Data Eng. Bull, 32*(3), 23–28.

N Alia Fahada, N. A., & Rahman, W. A. (2017). Why We Blog? The Malaysian Travel Blogger And Tourist Perspective. Journal of Tourism, *Hospitality and Environment Management, 2*(4). 12-28.

Etzel M. J., & Wahlers, R.G. (1985). The use of request promotional material by pleasure travelers. *J. Travel Res. 23*(4), 2-6.

Etzel, R. (2003). How environmental exposures influence the development and exacerbation of asthma. *Pediatrics, 112*(2), 233–239.

Fatemeh, A.A., & Ali, S. (2012). An architecture for a focused trend parallel

web crawler with the application of clickstream analysis. *Information Sciences, Elsevier, 184*(1), 266-281.

Fleiss J.L., Levin B., & Paik M.C. (2003) Assessing significance in a fourfold table. *statistical methods for rates and proportions, Third Edition.* John Wiley & Sons, New York, *(*pp. 50-63).

Francesco, R., Lior, R., Bracha, S., Paul, B. K., (2011). Recommender systems handbook. *Springer*, (pp 332 – 340).

Garzotto, F., Paolini, P, Speroni, M, Pröll, B, Retschitzegger, W & Schwinger, W. (2004). Ubiquitous access to cultural tourism portals, *Database & Expert Systems Applications.* Zaragoza, Spain, (pp. 67–72).

Getoor, L., & Sahami, M. (1999). Using probabilistic relational models for collaborative filtering. *Web Usage Analysis and User Profiling,* San Deigo. CA.

Gill, A.M., & Reed, M.G. (1997). The reimaging of a Canadian resource town: post productive in a North American context. *Applied Geographic Studies, 1*(2), 129–147.

Gotti, M. (2006). The language of tourism as specialized discourse. *Translating Tourism: Linguistic / Cultural Representations*. University di Trento: CA, (pp. 15-34).

Goodall, J. (1990). The mind of the chimpanzee. Soko *Publications Ltd.*

Goossens, C. (2000). Tourism information and pleasure motivation. *Annals of Tourism Research, 27*(2), 301-321.

Good, B. M., Tennis, J. T., Wilkinson, M. D. (2009). Social tagging in the life sciences: Characterizing a new metadata resource for bioinformatics. *BMC Bioinformatics.* 10, 313.

Goh, C.H. (2008). Developing a penang cultural tourism website prototype: a user-centred design approach, *Wacana Seni Journal of Arts Discourse*, 7, 91-109.

Gu, L. (2017). Digital Pre-Distortion of Carrier Frequency Offset for Reliable Wi-Fi Enabled IoTs. *Future Internet 2017,* (pp. 9-46).

Houts, P.S., Doak, C.C., Doak, L.G., & Loscalzo, M.J. (2006). The role of pictures in improving health communication: A review of research on attention, comprehension, recall, and adherence. *Patient Education and Counseling,* 61, 173–190

Hardy, L., (1990). A catastrophe model of performance in sport. *In J.G. Jones & L. Hardy (Eds.), Stress &performance in sport. Chichester,* NY: John Wiley, (pp. 81-106).

Hatton, M. J., (1999). Community-based tourism in the Asia Pacific. *Ontario/CTC/APEC: School of Media Studies,* Humber College.

Hamzah, B. (2008). Teori Motivasi Dan Pengukurannya Analisis Di Bidang Pendidikan. *Jakarta.*

Herlocker, J., Konstan, J., & Riedl. J. (2002). An empirical analysis of design choices in neighborhood-based collaborative filtering algorithms. *Information Retrieval, 5*(4), 287– 310.

Herrero, Á., & San Martín, H. (2012). Developing and testing a global model to explain the adoption of websites by users in rural tourism accommodations. *International Journal of Hospitality Management, 31*(4), 1178–1186.

Harris, R. W. (2009). Tourism in bario, Sarawak, Malaysia: a case study of pro-poor community-based tourism integrated into community development. *Asia Pacific Journal of Tourism Research, 14*(2), 125-135.

Honey, M. (1999). Ecotourism & sustainable development. *Washington D.C: Isl & Press.*

Hoffman, D.L., & T.P. Novak. (1996). Marketing in hypermedia computer-mediated environments: conceptual foundations. *Journal of Marketing,* 60, 50-68.

Hofacker, C.R., (2001). Internet Marketing. *3rd ed., NY: Wiley.*

Hsu, C. H. C., & Song, H. (2012). Projected images of major chinese outbound destinations. *Asia Pacific Journal of Tourism Research*, 17(5), 577-593.

Huh J. (2002). Tourist Satisfaction with Cultural/Heritage Sites: The Virginia Historic Triangle. *thesis submitted to the faculty of the Virginia polytechnic institute and state university in partial fulfillment of the requirements for the degree of master of science in hospitality and tourism management,* Blacksburg, Virginia.

Hull, J. C., & White, A.N. (2000). Valuing credit default swaps: modeling default correlations. *University of Toronto press.* CA.

Huston, G., & Michaelson, G. (2016). The Profile for algorithms and key sizes for use in the resource public key infrastructure. *Internet Engineering Task Force (IETF).* Retrieve from *http://www.rfc-editor.org/pdfrfc/rfc7935.txt.pdf.*

Hu, C. P. S., Chancellor, H. C., & Cole, S.T. (2011). Measuring resident‘s attitudes toward sustainable tourism: a reexamination of the sustainable tourism attitude scale. *Journal of Travel Research 50(*1*), 57- 63.*

Hunter, C. (1997). Sustainable tourism as an adaptive paradigm. *Annals of Tourism Research 24(*4*), 850- 867*.

Ibrahim, M.D. (2013). A Malaysian Homegrown Franchise. *International Business: Environments & Operations, 14(*12*), 514.*

Ibrahim, Y., & Razzaq, A. R. (2010). Homestay program and rural community development in Malaysia. *Journal of Ritsumeikan Social Sciences and Humanities,* 2, 7-24.

Inversini, A., Rega, I., Pereira, I. N., & Bartholo, R. (2015). The rise of eTourism for development. *Information and Communication Technologies in Tourism 2015. Springer International Publishing,* (pp. 419–431).

Ionescu, A., & Andreea Istoc, A. (2011). The development of an electronic business based on the MySQL technology. *Database Systems Journa, 2*(3), (53-61).

Itoga, H., & Lin, G.T.R. (2013). Using facebook for event promotion - implementing change. African Journal of Business Management, *7*(28), 2788-2793.

Isa, J. (2010). Dynamics of social roles in a knowledge management community. Computers in Human Behavior, 26, 533-546.

Jacek., G. (2013). Recommender System for a Knowledge Base. Praca dyplomowa magisterska, Politechnika Warszawska Wydział Elektroniki i Technik Informacyjnych Instytut Informatyki. Rok akademicki, (pp. 1-62)

Jennifer, R.C. (2002). Bipolar disorder: responding to challenges to indent. *The University of Texas at Austin press.*

Jiang, J., He, D., & Ni, C. (2011). Social reference: Aggregating online usage of scientific literature in CiteULike for clustering academic resources. *Proceeding of the 11th annual international ACM/IEEE joint conference on Digital libraries* (pp. 401–402).

Johnson, S.C. (1967). Hierarchical clustering Schemes. *Psychometrika*, *3*(2), 241–254.

Jones, O. (2008). Approaching the otherness of childhood. *Childrens Geographies, 6*(2), 195-212.

José-Antonio, G., Pilar, M., Sergio. A., Carmen, A., Hermenegildo, G., & José-Antonio, L. (2017). A Short Questionnaire for Satisfaction Evaluation of Virtual Rehabilitation Systems. Sensors, (pp. 1-12)

John, A. M., Paro, A. L., & Gordon K. L. (2017). Validation of a Cognitive Task Simulation and Rehearsal Tool for Open Carpal Tunnel Release, *Archives of plastic surgery,* (pp. 223-228).

Junhong, C. (2009). Online shopper behavior: influences of online shopping decision. *would you shop online for groceries.* Retrieved from *http://www.asiaone.com/Business/News/ My%2BMoney/Story/A1Story20090810-160169.html, Asiaone.com.*

Kayat, K. (2008). Stakeholders‘ perspectives toward a community-based rural tourism development. *European Journal of Tourism Research. 1*(1), 94-111.

Keeney, R. L. (1999). The Value of Internet Commerce to the Consumer. *Management Science. 45*(4), 533-542.

Kim, K., Uysal, M. & Sirgy, M.J. (2012). How does tourism in a community impact the quality of life of community residents. *Tourism Management,* 36, 527-540.

Koneya, M. (1975). Toward an essential definition of community development. *Journal of the Community Development Society, 6*(1), 4-12.

Krulwich, B. (1997). Lifestyle finder: intelligent user profiling using large-scale Demographic data. *Artif. Intell. Mag. 18*(2), 37–45.

Kurata, Y., & Hara, T. (2014). ICT-planner4: toward a more user friendly interactive day-tour planner. *Information and Communication Technologies in Tourism. Proceedings of the International Conference in Dublin*, (pp. 73–86).

Kulas, J. T., & Stachowski, A. A. (2009). Middle category endorsement in odd-numbered Likert response scales: Associated item characteristics, cognitive demands, and preferred meanings. *Journal of Research in Personality*, 43*(3),* 489-493.

Kwak, H., Lee, C., Park, H., & Moon, S. (2010). What is Twitter, a social network or a news media. *The 19th international conference on World Wide Web, New York, USA.*

Laffer, A.B. (1981). Government exactions and revenue deficiencies. *Cato Journal, 1*(1), 1-21.

Lanier, P., & Berman, J. (1993). Bed-and-Breakfast Inns Come of Ages. *Hotel and Restaurant Administration Quarterly, 34*(2), 15-23.

Lightstone S., Teorey T., & Nadeau T. (2007). Physical Database Design: the database professional's guide to exploiting indexes, views, storage, and more. *Morgan Kaufmann Press.* USA.

Liu, B. (2007). Web Data Mining – Exploring hyperlinks, contents and usage data. *Springer, second edition,* USA. Retrieved form http://sirius.cs.put.poznan.pl/~inf89721/Seminarium/Web_Data_Mining__2nd_Edition__Exploring_Hyperlinks__Contents__and_Usage_Data.pdf

Linden, B.S., & York. J. (2003). Amazon.com Recommendations: item-to-item collaborative filtering. *Published by the IEEE Computer Society (*pp. 76-80*).* Retrieved from *https://www.cs.umd.edu/~samir/498/Amazon-Recommendations.pdf.*

Lin, Z. (2009). Economic Development and Transition: Thought, Strategy, and Viability. *Cambridge University Press,* UK.

Liu, A. (2006). Tourism in rural areas: Kedah, Malaysia. *Tourism Management,* 27, 878-889.

Logesh. R., & Subramaniyaswamy. V. (2016). A Collaborative Location Based Travel Recommendation System through Enhanced Rating Prediction for the Group of Users. *Hindawi Publishing Corporation, Computational Intelligence and Neuroscience* (pp. 1-28).

Taylor, K. (2008). Mapping the intricacies of young adults' developmental journey from socially prescribed to internally defined identities, relationships, and beliefs. Journal of College Student Development, *49*(3), 215-234.

Toine, B., Antal V. D. B., (2009). Collaborative and content-based filtering for item recommendation on social bookmarking websites, *ACM RecSys '09 Workshop on Recommender systems and social web*, New York, NY, USA.

Liu, L., & Tamer, M. O. (2009). Encyclopedia of Database Systems. *Springer,* pp 6-23.

Littlestone, S., & Warmuth. M. (1994). The Weighted Majority Algorithm. *Information and Computation, 108*(2), 212¬261.

Loban, S. (1997). A framework for computer-assisted travel counseling. *Annals of Tourism Research, 24*(4), 813–831.

Lordkipanidze, M., Brezet, H., & Backman, M. (2004). The entrepreneurship factor in sustainable tourism development. *Journal of Cleaner Production,* 13, 787-798.

Long, L., Xu, J., Liao, S.S., & Chen, H. (2014). A real-time personalized route recommendation system for self-drive tourists based on vehicle to vehicle communication. *Expert Systems with Applications 41 (7), 3409-3417.*

Lovelock, C., Wirtz, J. (2006). Service Marketing: People, Technology, Strategy. 6th Edition, Prentice Hall Upper Saddle, NJ.

Lovelock, C., Gummesson, E. (2004). Whither Services Marketing? In Search of a New Paradigm and Fresh Perspective. Journal of Service Research, 7 (1), 20-41.

Luotonen. A, (1994). World-wide web proxies. *First International Conference on WWW, 27(2),147–154.*

Laila, S., & Akram, S. (2013). Exploiting User Demographic Attributes for Solving Cold-Start Problem in Recommender System. *Lecture Notes on Software Engineering*, *1*(3), 303-307.

Malville, P., Mooney, R.J., & Nagarajan, R. (2002). Content-boosted collaborative filtering for improved recommendations. *Proceedings of the 18th National conference on Artificial Intelligence(AAA102), Edmonton, Alberta, Canada.*

Mapjabil, J., & Che Ismail, S. (2012). Program Homestay di Sungai Semilang, Pulau Pinang: Pembangun. *Perubahan Persekitaran, Boston*.

Mapjabil, Y., Ismail, S.C.H., Rahman, A.B., Masron, T., Ismail, R., Zainol, R.M. (2010). Homestays - community programme or alternative accommodation? a re-evaluation of concept and execution. Malaysian Journal of Society and Space. *11*(12), 1– 8.

Michael, J. P. (1999). A framework for collaborative, content-based and Demographic filtering. *Artificial Intelligence Review, 13*(5), 393–408.

Michael D. E., John T. R., & Joseph A. K. (2010). Collaborative filtering recommender systems, *Foundations and Trends in Human–Computer Interaction, 4*(2), 81–173.

Miler, C.T. & Kaiser, C.R. (2001). Implications of mental model's self and Others of for the targets stigmatization. *In M.R. Leary, Interpersonal rejection* (pp. 189-212). *New York: Oxford University Press.*

Michaela, D.P. (2014). U.S. Travel and tourism: industry trends and policy issues for congress. *Cornell University ILR School, Federal publication.*

Mizal, K., Fabeil, n. F. & Pazim, k. H. (2014). Financial sustainability of community-based tourism. *International Journal of Research in Business Management, 2*(1), 23-32.

Mowforth, M., & Munt, I. (1998). Tourism and Sustainability. London: Routledge. *Retrieved from http://www.nua.ie/surveys/indesx.cgi? = FSandcat_id =33.*

Mobasher, H. D., Luo, T., & Nakagawa, M. (2002). Discovery & Evaluation of Aggregate Usage Profiles for Web Personalization. *Data Mining & Knowledge Discovery, 6*(1), 61-82.

Mathew, D., McKibbon, K.A., Lokker, C., Colquhoun, H. (2014). Engaging With a Wiki Related to Knowledge Translation: A Survey of WhatisKT Wiki Users. *J. Med. Internet,* (pp. 16-21).

Mooney, R.J., & Roy, L. (2000). Content-based book recommending using learningfor text categorization. ACM Conference on Digital Libraries, San Antonio, U.S, pp.195-240. Retrieved from http://www.cs.utexas.edu/~ml/papers/libra-dl-00.pdf

Mohamad, A. A., Lo, M. C., Songan P., & Wee, A.Y. (2010). Malaysian ministry of finace. *Parlimen Malaysia, E-Review of Tourism Research, 8*(5), 123-135.

Mooney, R. J., & Roy, L. (2000). Content-based book recommending using learning for text categorization. *In Proceedings of the Fifth ACM Conference on Digital Libraries,* (pp. 195–204).

Nyaupane, G. P., Morais, D. B., & Dowler, L. (2006). The role of community involvement and number/type of visitors on tourism impacts: a controlled comparison of Annapurna, Nepal and Northwest Yunnan, China. *Tourism Management, 27*(6), 1373-1385.

Obed, H.M., (2017). Reviewing the role of tourism marketing in successful sustainable tourist destinations. *African Journal of Hospitality, Tourism and Leisure*, *6*(2), 1-9.

Oluwatayo, J.A. (2012). Validity and reliability issues in educational research. *Journal of Educational and Social Research, 2*(2), 391-400.

Ovretveit, J. (2001). Evaluating health interventions. *John Wiley & Sons*, *16*(4), 279-378.

Palmer, S. E. (2002). Perceptual grouping: it's later than you think. *Current Directions in Psychological Science, 11*(3), 101-106.

Pazzani, M. (1999). A framework for collaborative, content-based & demographic filtering. *Artificial Intelligence Review. 13*(5-6), 393-408.

Papadopoulos, G., & Dionysopoulou, P. (2015). The impact of social media and web 2.0 technologies in the choice of touristic destination. *International Conference on Experiential Tourist Santorini,* pp. 1-8. Retrieved from *http://imic2015.conferences.gr/wpcontent/uploads/papadopoulos_dionysopoulou.pdf.*

Park.M, Saem., M., & Cho., S. (2015). Mobile information recommendation using multi-criteria decision making with bayesian network. *International Journal of Information Technology & Decision Making, 14*(2), 317-338.

Porter, M. (2001). Strategy & the internet. *Harvard Business Review, 79*(3), 63–78.

Priyanka, R., & Vijendra, S. (2016). Systematic Evaluation of Social Recommendation Systems: Challenges and Future. *(IJACSA) International Journal of Advanced Computer Science and Applications*, *7*(4), 158-166.

Pinho, E., & Costa, C. (2016). Extensible Architecture for Multimodal Information Retrieval in Medical Imaging Archives. *International Conference on Signal-Image Technology & Internet-Based Systems (SITIS)*, (pp. 316-322)

Reuber R & Fischer E. (2010). The double-edged sword for new firms of personal branding via social media channels, University of Toronto, York University.

Resnick, M. (1994). Changing the centralized mind. *Technology Review,* (pp. 32-40).

Richardson, M., (2002). An elementary proposition concerning parallel imports. *Journal of International Economics,* 56, 233 – 245.

Rich, G.A. (1997). The sales manager as a role model: effects on trust, job satisfaction and performance of sales people. *Journal of the Academy of Marketing Science,* (pp. 319-328).

Robert, G.H. (1998). Merchant Differentiation through Integrative Negotiation in Agent-mediated Electronic Commerce. *Master's Thesis, School of Architecture and Planning, Program in Media Arts and Sciences, Massachusetts Institute of Technology.*

Rox, H. (2007). Top reasons people shop online may surprise you. Retrieved from http://www.associatedcontent.com/article/459412/top_reasons_people_shop_online_may.html?cat=3, *Associatecontent.com.*

Russell, P. (2005). Award-winning development team welcomes new arrival joomla. Retrieved from http://itkadeh.com/download/official-joomla.pdf.

Logesh, R., & Subramaniyaswamy, V. (2016). A Collaborative Location Based Travel Recommendation System through Enhanced Rating Prediction for the Group of Users. *Hindawi Publishing Corporation Computational Intelligence and Neuroscience* (pp. 1-29).

Sangoseni O, Hellman M., & Hill, C. (2013). Development and validation of a questionnaire to assess the effect of online learning on behaviors, attitudes, and clinical practices of physical therapists in the united states regarding evidence-based clinical practice. *The Internet Journal of Allied Health Sciences and Practice, 11*(2), 1-13.

Sajad, E.M., Zainab, K., Edmundas, K.Z., Abbas, M., Amir, A.N., & Ungku, N.U.A. (2017). Residents' Attitude toward Tourism Development: A Sociocultural Perspective. Sustainablity, (pp. 1-29)

Sakal, M. (2010). GUI vs. WUI through the prism of characteristics and postures. Management Information Systems, *5*(1), 3-6.

Sanjeev, K. & Mishra, K. (2014). Marketing of Services: Challenges & Opportunities in Today s Global Competitive Business Environment. International Journal on Recent and Innovation Trends in Computing and Communication, 2 (11), 3628 – 3632

Stan, k., & Stephen, B. (2006). Exploring the internet use of small tourism enterprises: evidence from a developing country. The Electronic Journal on Information Systems in Developing Countries, *3*(27), 1-21.

Schafer, M.A., Konstan, J., & Reidl, T. (2006). Recommender Systems for the web. *Springer*, (pp. 102-123).

Scholz., M, Dorner., V, Franz., M. & Hinz., O. (2015). Measuring consumers' willingness to pay with utility-based recommendation systems. *Decision Support Systems*, (pp. 60–71).

Schmitt, S., & Bergmann, R. (1999). Applying case-based reasoning technology for product selection &customization in electronic commerce environments. *12th Bled Electronic Commerce Conference.* Slovenia, Retrieved from https://www.researchgate.net/profile/Ralph_Bergmann/publication/236951420_Applying_case-based_reasoning_technology_for_product_selection_and_customization_in_electronic_commerce_environments/links/549307de0cf286fe3122b902.pdf.

Seock, Y.K., & Norton, M., (2007). Attitude toward internet web sites, online information search, and channel choices for purchasing. *Journal of Fashion Marketing and Management, 11*(4), 571-586.

Sharpley, R., & Sharpley, J. (1997). Rural tourism: an introduction. *International Thomson Business Press*. UK.

Shi, Y., Larson, M., & Hanjalic, A. (2014). Collaborative filtering beyond the user-Item matrix: a survey of the state of the art and future challenges, *ACM Compute, 47*(1), 1-45.

Shani, G., & Gunawardana, A. (2011). Evaluating recommendation systems. *Recommender Systems Handbook. Springer,* U.S, (pp. 257-297).

Stock, O. (2000). Intelligent Interfaces for the Tourist. *In Information & Communication Technologies in Tourism 2000, Springer-Verlag, Wien, Austria.*

Smyth, J. D. (2016). Designing questions and questionnaires. In C. Wolf, D. Joye, T.W. Smith, & Y. Fu (Eds.), The SAGE Handbook of Survey Methodology. Thousand Oaks, CA: Sage.

Su, C.C., & Huh, C.A. (2002). Atmospheric 210 protanomaly as a precursor of volcano eruption. *Geophysical Research Letter, 29*(5), 11-27.

Sun, H., & Jafar, S.A. (2016). The capacity of private information retrieval with colluding databases. *Global Conference on Signal and Information Processing (GlobalSIP), Washington, DC,* (pp. 941-946).

Tan K. G., Sasidaran G., & Ye Y. (2016). Drivers of Growth in the Travel and Tourism Industry in Malaysia: A Geweke Causality Analysis. Economies, *4*(3), 1-15.

Terveen, L.G., & Hill. W.C. (2001). Beyond recommender systems: helping people help each other. *Addison-Wesley,* USA.

Ting, Y., Sunghee, L., Mingnan, L., & Mengyao H. (2016). Questionnaire Design, *Cross-Cultural Survey Guidelines,* (pp. 150-180)

The Star Online, (2014). Tourism Malaysia defends inclusion of Singaporeans in tourist arrival. Access from The Star Online. Retrieved from

http://www.thestar.com.my/News/Nation/2013/01/24/Tourism-Malaysia-defends-inclusion-ofSingaporeans-in-tourist-arrival.

Towle, B., & Quinn, C. (2000). Knowledge based recommender systems using explicit user models. *In Knowledge-Based Electronic Markets. Menlo Park.*

UNWTO. (2013). The United Nation World Tourism Organization. Retrieved from *http://cf.cdn.unwto.org/sites/all/files/pdf/unwto_annual_report_2013_0.pdf.*

Umanets, A., Ferreira, A., & Leite, N. (2014). GUIDEME—a tourist guide with a recommender system and social interaction. *Proceedings of the Conference on Electronics, Telecommunications and Computers. 2*(17), 407–414.

Van, G., & Jennifer. (2010). How twitter users changed in 2010. Mashable.com. Retrieved form *http//mashable/2010/12/16/twitter-stars-2011.*

Vassilis, S. M., Charalambos L., Andreas, D., & Loukas, T., (2004). Website Quality Assessment Criteria. *Proceedings of the Ninth International Conference on Information Quality (ICIQ-04),* (pp. 59-73).

Veronika, T. (2012). Calculating Similarity of Arbitrary Reports. *Faculty of Computer Science Institute of Systems Architecture, Technische Universitat Dresden. Retrieved form* https://lat.inf.tu-dresden.de/~thost/thesis.pdf.

Víctor, V. F. , & Antonio M. R. (2011). New Campaigns of Tourism Promotion And Marketing. The Importance of Specialization in the Image of European Brochures. *Ekonomika Ir Vadyba,* (pp. 145-156).

Vollmer, C., & Precourt, G. (2008). Always on: Advertising, marketing, & media in an era of consumer control. *McGraw-Hill. New York.*

Wakaba, j. (2011). A determination of the extent which social media marketing is practiced by small &medium hotels in Nairobi. *Unpublished masters' dissertation, university Nairobi*, Nairobi, Kenya.

Werthner, H., & Klein, S. (1999). Information Tech & Tourism – A Challenging Relationship. *Springer,* Wien & New York.

Williams, C., Mobasher, B., Burke, R., Savig, J.J., & Bhaumik, R. (2006). Detection of Obfuscated Attacks in Collaborative Recommender System. *Center for Web Intelligence School of Computer Science, Telecommunication and Information Systems DePaul University,* Chicago. http://facweb.cs.depaul.edu/mobasher/research/papers/wmbsb-ecai-ws06.pdf.

Williams, T.R. (2000). Guidelines for designing and evaluating the display of information on the Web. *Technical Communication, Humanities Module, 47* (3), 383.

Wu, C.Y., C. V. Alvino, A. J. Smola, and J. Basilico. (2016). Using navigation to improve recommendations in real-time, *ACM Conference on Recommender Systems*, (pp. 341–348).

Wynd, C.A., & Schaefer M.A. (2002). The osteoporosis risk assessment tool: establishing content validity through a panel of experts. *Applied Nursing Research. 15*(3), 184-188.

WTTC, (2016). Travel & tourism economic impact 2016 - world. *Retrieved from* http://www.wttc.org/-/media/files/reports/economic%20impact% *20research/regions %202016/ world2016.pdf.*

WTTC, (2017). Travel & tourism economic impact 2017 - world. *Retrieved from https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2017/malaysia2017.pdf*

Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management,* 31, 179-188.

Yandi, X., Shikhar, V., Giuseppe, D.F., & Ankur, D. (2017). A Content-based Recommender System for E-commerce Oers and Coupons. *SIGIR eCom,* (pp. 1-7)

Yin., Zhimin., Xiangzhan Yu., & Zhang, H. (2014). Commodity recommendation algorithm based on social network. *In Advances in Computer Science and its Applications*, (pp. 27-33). *Springer Berlin Heidelberg.*

Yunis, E. (2004). Indicators to measure sustainability in tourism. *7th International Forum on Tourism Statistics, Stockholm. Sweden.*

Yu, C.C. (2012). Husserl an Ethical Renewal and Philosophical Rationality: Intercultural Reflection. *Investigations Phenomenological,* (pp. 145-156).

Yu, T., & Wu, G. (2007). Determinants of internet shopping behavior: an application of reasoned behavior theory. *International Journal of Management, 24*(4), 744-762.

Zhang, H. & Lei, S.L. (2012). A structural model of resident‘s intention to participate in ecotourism: the case of a wetland community. *Tourism Management,* 33, 916-925.

Zhang, Y., & Hitchcock, M. J. (2017). The Chinese female tourist gaze: a netnography of young women's blogs on Macao. *Current Issues in Tourism, 20*(3), 315-330.

Zhong, L., Deng, J., Song, Z., & Ding, P. (2011). Research on environmental impacts of tourism in China: progress and prospect. *Journal of Environmental Management*, *92*(11), 2972-2983.

Appendix A: Questionnaire for CBWR Homestay website assessment

Dear Participant

My name is Mahadi Hasan Miraz and I am a graduate student at University Utara Malaysia. For my final thesis requirement, I am administrating a survey as below. You are randomly selected as the participant of the survey. Please participate in this research study by completing the attached survey.

The following questionnaire requires only a short some time to complete. There is no compensation for responding nor is there any known risk to finish the questionnaire. All information will remain confidential. Copies of the project will be provided to the University is authority. If you choose to participate in this study, please answer all questions as honestly as possible and return the completed questionnaire promptly. Participation is strictly voluntary and you are welcome to be a part of the study.

Thank you for taking the time to assist me in my educational endeavors. The data collected will provide useful information regarding the website evaluation. Completion and returning of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please feel free to contact me at the address below.

Sincerely,
Mahadi Hasan Miraz
Mahadimiraz1@gmail.com

Name:

Occupation:

Nationality:

			1	2	3	4	5	6	7		NA
1. Please rate our website on the overall content	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
2. Please rate our website on the ease of navigation	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
3. Please rate our website on the overall the look.	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
4. The vocabulary on our website is appropriate for the intended audience	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
5. The illustrations are appropriate	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
6. The text is clearly written and easy to understand	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
7. There are no grammar or spelling errors	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
8. The information on our website is accurate	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
9. The information is timely and up-to-date	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
10. The information is sufficient for the intended audience	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
11. The organization of the site is logical and clear	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
12. The user can clearly see where she/ he is on the site	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	
13. The user can easily move	strongly disagree	○	○	○	○	○	○	○	strongly agree	○	

through the site to a desired location										
14. The style is consistent throughout the site	strongly disagree	○	○	○	○	○	○	○	strongly agree	○
15. Links are current and working	strongly disagree	○	○	○	○	○	○	○	strongly agree	○
16. The background colors are pleasing	strongly disagree	○	○	○	○	○	○	○	strongly agree	○
17. Visuals enhance rather than reduce from the message of the site	strongly disagree	○	○	○	○	○	○	○	strongly agree	○
18. The size of the text is easy to read	strongly disagree	○	○	○	○	○	○	○	strongly agree	○
19. The site is attractiveness-	strongly disagree	○	○	○	○	○	○	○	strongly agree	○

Source: (Ovretveit, 2001).

APPENDIX B: Calculation of total users for CBWR websites

1. Calculating the Total user of Homestya D'Belimbing

To find the total number of viewer who viewed the Homestay D-Belimbing. Then the web recommended website homepage will show the visitor history of Homestay D-belimbing.

$H=U\times I;\ W=R+(N+S)$ *for* $N=1, 2 \ldots, S$

Where,

H = User recommendations
U = User ID
I = Number of users that access a particular homestay recommended website
N = User identity number (Where N is integer)
S = New number of users
W = Particular user for CBWR website
G = Number of current user

$H = U*I$
$H = 1*1$
$H = 1$

$W = H+N \quad [R=1, H=1]$
$W = 1+1$
$W = 2$
$G = H+(N+S)\ [S=1, H=1, N=1]$
$G = 1+1+1$
$G = 3$
$DB = H+(N+S)\ [S=63, H=1, N=1]$
$DB = 1+1+63$
$DB = 65$

Where,

DB= Recommended website

Finally, the CBWR website shows the user recommendation for Homestay D-belimbing.

2. Total user of homestay Kampung Raga

To find the total number of viewer who viewed the Homestay Kampung Raga. Then the web recommended website homepage will show the visitor history of Homestay Kampung Raga.

$H=U\times I;\ W=R+(N+S)$ *for* $N=1, 2, \ldots, S$

Where,

H = User recommendations
U = User ID
I = Number of users that access a particular homestay recommended website
N = User identity number (Where N is integer)
S = New number of users
W = Particular user for CBWR website

KR = Total user of Kampung Raga
G = Number of current user

$H=U\times I;\ W=R+(N+S)\quad for\ N=1, 2, \ldots, S$

$H = U*I$
$H = 1*1$
$H = 1$
$W = H+N \quad [N=1, H=1]$
$W = 1+1$
$W = 2$
$G = H+(N+S)\ [S=1, H=1, N=1]$
$G = 1+1+1$
$G = 3$

$KR = H+(N+S)\ [S=39, H=1, N=1]$
$KR = 1+1+39$
$KR = 41$

Finally, the CBWR website shows the user recommendation for Homestay Kampung Raga.

3. Total user of homestay Pulau Pisang

To find the total number of viewer who viewed the Homestay Pulau Pisang. Then the web recommended website homepage will show the visitor history of Homestay Pulau Pisang.

$H=U\times I;\ W=R+(N+S)\quad for\ N=1, 2, \ldots, S$

Where,
H = User recommendations
U = User ID
I = Number of users that access a particular homestay recommended website
N = User identity number (Where *N* is integer)
S = New number of users
W = Particular user for CBWR website
G = Number of current user

$H = U*I$
$H = 1*1$
$H = 1$
$W = H+N \quad [N=1, H=1]$
$W = 1+1$
$W = 2$
$G = H+(N+S)\ [S=1, H=1, N=1]$
$G = 1+1+1$
$G = 3$
$PP = H+(N+S)\ [S=39, H=1, N=1]$
$PP = 1+1+39$
$PP = 41$

Finally, the CBWR website shows the user recommendation for Homestay Pulau Pisang.

4. **Total user of homestay Pantai Jamai**

To find the total number of viewer who viewed the Homestay Pantai Jamai. Then the web recommended website homepage will show the visitor history of Homestay Pantai Jamai.

$H=U\times I;\ W=R+(N+S)\quad for\ N=1, 2, \ldots, S$

Where,

H = User recommendations
U = User ID
I = Number of users that access a particular homestay recommended website
N = User identity number (Where N is integer)
S = New number of users
W = Particular user for CBWR website
G = Number of current user
PJ = Recommended website

$H = U*I$
$H = 1*1$
$H = 1$
$W = H+N \quad [N=1, H=1]$
$W = 1+1$
$W = 2$
$G = H+(N+S)\ [S=1, H=1, N=1]$
$G = 1+1+1$
$G = 3$
$PJ = H+(N+S)\ [S=39, H=1, N=1]$
$PJ = 1+1+39$
$PJ = 41$

Finally, the CBWR website shows the user recommendation for Homestay Pantai Jamai.

5. **Total user of homestay Paya Guring**

To find the total number of viewer who viewed the Homestay Paya Guring. Then the web recommended website homepage will show the visitor history of Homestay Paya Guring.

$H=U\times I;\ W=R+(N+S)\quad for\ N=1, 2, \ldots, S$

Where,

H = User recommendations
U = User ID
I = Number of users that access a particular homestay recommended website
N = User identity number (Where N is integer)
S = New number of users
W = Particular user for CBWR website
G = Number of current user
PG = Recommended website

$H = U*I$
$H = 1*1$
$H = 1$

W = H+N [N=1, H=1]
W = 1+1
W = 2
G = H+ (N+S) [S=1, H=1, N=1]
G = 1+1+1
G = 3
PG =H+ (N+ S) [S=39, H=1, N=1]
PG =1+1+39
PG =41
Finally, the CBWR website shows the user recommendation for Homestay Paya Guring.

6. Total user of homestay Pulau Tuba

To find the total number of viewer who viewed the Homestay Pulau Tuba. Then the web recommended website homepage will show the visitor history of Homestay Pualu Tuba.

H=U×I; W=R+ (N+S) for N=1, 2 ,..., S
Where,
H = User recommendations
U = User ID
I = Number of users that access a particular homestay recommended website
N = User identity number (Where *N* is integer)
S = New number of users
W = Particular user for CBWR website
PT = Recommended website
G = Number of current user
*H = U*I*
H = 1*1
H = 1
W = H+N [N=1, H=1]
W = 1+1
W = 2
G = H+ (N+S) [S=1, H=1, N=1]
G = 1+1+1
G = 3
PT =H+ (N+ S) [S=39, H=1, N=1]
PT =1+1+39
PT =41
Finally, the CBWR website shows the user recommendation for Homestay Pulau Tuba.

7. The total user of homestay Sungai Badak

To find the total number of viewer who viewed the Homestay Sungai Badak. Then the web recommended website homepage will show the visitor history of Homestay Sungai Badak.

H=U×I; W=R+ (N+S) for N=1, 2 ,..., S

Where,

H = User recommendations
U = User ID
I = Number of users that access a particular homestay recommended website
N = User identity number (Where *N* is integer)
S = New number of users
W = Particular user for CBWR website
SB = Recommended website
G = Number of current user

*H = U*I*
H = 1*1
H = 1
W = H+N [N=1, H=1]
W = 1+1
W = 2
G = H+ (N+S) [S=1, H=1, N=1]
G = 1+1+1
G = 3
SB =H+ (N+ S) [S=39, H=1, N=1]
SB =1+1+39
SB =41

Finally, the CBWR website shows the user recommendation for Homestay Sungai Badak.

No	**Conference Proceedings**
1	Mahadi Hasan Miraz, Razamin Ramli, Mohd Faizal Omar, Kalsom Kayat & Ku Ruhana Ku-Mahamud.(2016) Community-Driven Innovative Technology: An Avenue to Promote Malaysian Homestay programmes, international conference on science, Technology & engineering and Management, 19-20 May 2016, Muscat, Oman.
2	Mahadi Hasan Miraz, Razamin Ramli & Ku Ruhana Ku-Mahamud, (2015). Web Recommender for Homestay Malaysia, International Conference on Technology Management, Business and Entrepreneurship (ICTMBE), Kings Green Hotel Melaka, 24-25 November 2015
3	Mahadi hasan miraz, Ferdoush Saleheen & Mashiour Rahman, (2016). Supply chain management in service Quality**,** International Conference on Industrial Engineering and Operations Management in Kuala Lumpur, Malaysia, 8-10 March, 2016
4	Mahadi Hasan Miraz, Razamin Raml, Ku Ruhana Ku-Mahamud, Abu Raihan Bhuiyan Albarune & Foazul Islam.(2015). A Study on Homestay Malaysia: ICT Applications, Proceedings of International Conference on Networking and Computer Application, July 15-16, 2015, IEEE, ISBN: 9788193137314

No	**Journal articles**
1	Mahadi Hasan Miraz, Razamin Raml, Ku Ruhana Ku-Mahamud, Abu Raihan Bhuiyan Albarune & Foazul Islam.(2015). ICT APPLICATIONS ON HOMESTAY MALAYSIA. International Journal of Science Research and Technology Volume 1 Issue 2, p p 22-31, 15th December 2015, IEEE, ISSN: 2379-3686**.**
2	Saleheen, F., Miraz, M.H., Ramli, R. (2014). IT Operations in Retail Banking: A Case Study, Journal of Applied Management and Investments (Scoups) 2014, vol. 3, issue 4, pp. 245-250.
3	Miraz, M.H., Saleheen, F., Habib, Dr. Md. Mamun, Mahmuddin, M. & Nazri, E. (2015). Mobile banking: challenges and opportunity, a case study in Bangladesh. Advanced Education and Management (Scopus), Guilin, China, 2015
4	Saleheen, F., Miraz, M..H., Habib, Dr. Md. Mamun., Hanafi, Dr. Zurina. (2014). Challenges of Warehouse Operations: A Case Study in Retail Supermarket, International Journal of Supply Chain Management (IJSCM) (Scopus), 2014, vol.3, no.4, pp 63-67