

Perlis's Tourism: Accomodation And Facilities Determination Based On GIS Application

**Norfariza Zainal*¹, Ernieza Suhana Mokhtar¹, Siti Maryam Abdul
Wahab¹, Nor Azlan Yusof¹ and Surina Nayan²**

¹Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA,
Perlis, MALAYSIA

²Faculty of Academy of Language Studies, Universiti Teknologi MARA, Perlis,
MALAYSIA

Accommodation is one of the important aspects in the tourism development which is the competitive tourist sector. By providing adequate information of accommodation in terms of place, availability of facilities and price, it will be easier for travellers to choose any accommodation that meets their needs and budget. Thus, the aim of this project is to develop a one-stop centre of information for accommodation in Perlis to support the needs of tourists. The goals of the project are to prepare the georeferenced location, ii) detailed information about the facilities and the rate of each accommodation provided. As a result, the information on accommodation can retrieve from the centre of information, and it will help tourists in planning their vacation. In addition, the project will aid the Ministry of Tourism, Perlis office to manage and update every hotel and homestay information surrounding Perlis.

Key words: tourism, accommodation, facilities, GIS

Introduction

Geographic Information System (GIS) is a set off a powerful system that capable of analyzing the georeference spatial model, and it offers the structured data management and data access possibility. The objects on the earth can determine by using the GIS environment accurately depending on the data quality and the information stored in the database. GIS is equally useful in tourism, which consists of many aspects, including facilities, activities, services, and industries to deliver a travel experience. GIS used to decide the best place for a new tourist destination while trying to keep up a sustained natural area (Butler, 1993). Hence, the strength of tourism planning can enhance by the GIS applications. GIS is about providing a toolbox of techniques and technologies of wide applicability to the sustainable tourism development achievement (Giles, 2003).

Nowadays, tourism has become a global leisure activity among people including Malaysians. Tourism refers to visiting the fascinating places, travelling,

*Email: ernieza@perlis.uitm.edu.my

recreational, vacation and business potential. During the vacation, travellers will plan their journey by estimating the budget and looking at the accommodation that meet their needs. Currently, the common methods used by the travellers are by searching on the different hotel websites or web using the search engines to find out the most suitable accommodation for the holiday purposes. Besides, all the information on accommodation is not available in one database, and this will create problems, especially the homestays information is not well promoted rather as compared to hotels since they are personally managed. Tourists will face problems in choosing suitable accommodation, which complies their needs.

To solve this problem, a dynamic Perlis map supported by the GIS modules (combination of information of different type accommodations such as hotel and homestay with the facilities provided) use in this study to help people making their decisions on their tourism planning.

Perlis Overview

Perlis is the smallest state in Malaysia. It lies on the northern part of the west coast of Peninsular Malaysia. Perlis bounded on the north by Thailand, the south and east by Kedah and the west by the Straits of Melaka. Perlis is surrounding by agriculture's activities such as paddy field, *harum manis*, local grapes and sugar cane plantation depending on the season. According to the Department of Statistic, Malaysia in 2010, the population in Perlis is about 0.2 million. The ethnic composition for the year 2010, in Perlis was Malay (174,805), Chinese (21,058), Indian (2,658), and others (20,690). Even though Perlis is the smallest state in Malaysia, it does not lose out to other states in terms of tourism attractiveness. Oxford (2003) defined tourism as the business of providing and arranging holidays and services for people who are visiting a place. The number of international and domestic tourists has increased tremendously (Figure 1) and this has become the main contributor to the boost economy of Perlis.

PINTU MASUK (Entrance Point)	KUALA PERLIS	PADANG BESAR	KERETAPI TANAH MELAYU BERHAD	WANG KELIAN	JUMLAH (Total)
BULAN (Month)					
JANUARI (January)	667	19,137	1,670	9,932	31,626
FEBRUARI (February)	737	16,158	1,683	8,542	27,120
MAC (March)	767	17,834	1,395	9,963	29,959
APRIL (April)	785	29,925	1,176	8,973	40,859
MEI (May)	820	28,141	1,177	9,536	39,674
JUN (June)	779	27,493	1,338	7,700	37,310
JULAI (July)	704	31,788	1,370	10,262	44,124
OGOS (August)	707	27,201	1,258	9,104	38,270
SEPTEMBER (September)	611	26,421	1,306	9,412	37,750
OKTOBER (October)	828	23,970	1,323	11,453	37,574
NOVEMBER (November)	752	22,323	1,263	10,159	34,497
DISEMBER (December)	629	23,840	1,353	9,382	35,204
JUMLAH (Total)	8,806	294,231	16,512	114,418	433,967

Figure 1. Statistic of Tourist Arrival in Perlis
(Source: www.perlis.gov.my)

Perlis has various tourism resources either from natural resources; artificial or themed events that highlighted and promoted to attract both domestic and international tourists. There are a some interesting places to visit in Perlis such as *Gua Kelam*, *Kota Kayang* Museum, *Padang Besar*, Snake and reptile farm, Perlis State Park and *Sungai Batu Pahat*. As for this research, the chosen study area is Kangar, Perlis.

In existence of many interesting places in Perlis, the number of accommodation available is also increasing. For instance:

- i. Hotels – Putra Palace, Hotel Seri Malaysia, Brasmana Hotel, Sri Garden Hotels, etc.
- ii. Motels – Zulam Budget Motel, Q Motel Kuala Perlis, Dias Honey Motel, etc.
- iii. Chalets –Bukit Ayer Chalets, Aqua In Chalets, Sungai Paya Chalets, etc.
- iv. Homestays – Azi Homestay, Mahaji Homestay, Noor Homestay, Anis Homestay, etc.

GIS Data Model In Tourism Application

GIS is an integrated system with technology and it is widely used in various applications such as in tourism planning, environmental management, agricultural, urban development, etc. GIS application has contributed to the current system enhancement development by offering dynamic and digital maps. Geographic Information System (GIS) is a rapidly expanding field enabling the applications development that manage and use geographic information in combination other types of media (Jovanovic and Njegus, 2008).

GIS is integrating with spatial and non-spatial data models. Spatial data model focuses on the shape of the features such as road, building, tree, etc. GIS reads all the features as line, polygon and point shape for modeling the real world at the accurate location that assigned in coordinating system World Geodetic System 1984 (WGS84) or Malayan Rectified Skew Orthomorphic (MRSO). Non-spatial (attributes) data model is a GIS database that describes the features in the form of a table. The spatial and non-spatial data models integrate into tourism planning to offer the efficient GIS digital maps.

Several data models need to provide the digital maps that meet the demand of Perlis tourists such as service's features (accommodation, facilities provided), fascinating places, transportation services and network. The accommodation and facilities provided are the main aspects in this study to support the needs of the tourists. Figure 2 shows the required integrated data models to meet the aim of this study.

Travellers need to plan their vacation by identifying the accommodation that meets their budget and needs. The current conventional method used is by searching each of the accommodations and facilities provided in different web sources such as Google, Yahoo, stand-alone website etc. For the budget hotel and homestay, they are not promoted on the website, and are only advertised in front of the house. By using the GIS applications, all the stated problems will be overcome by providing a systematic system for tourists to search for their place to stay in Perlis.

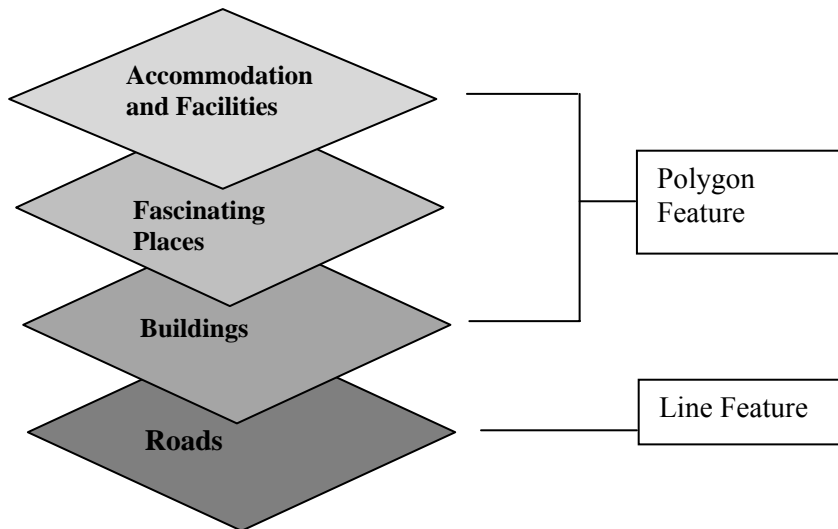


Figure 2: Tourism Data Models

Conceptual Framework

The study divided into the following. They are: i) study area and software exploration, ii) spatial and attributes on the Perlis tourism data collection, iii) data processing and iv) result and analysis. Figure 4 shows the detailed methodology of the study.

Kangar, Perlis selected as the study area because the accommodation that includes hotels and homestays are scattering in the center of the city (Figure 3). In this study, the open source, QGIS software which obtained directly from the QGIS website used to digitize the Perlis base map into several feature types such as line (road) and polygon (buildings, fascinating places and accommodation). The QGIS is free accessed software that used for multi-disciplinary applications.

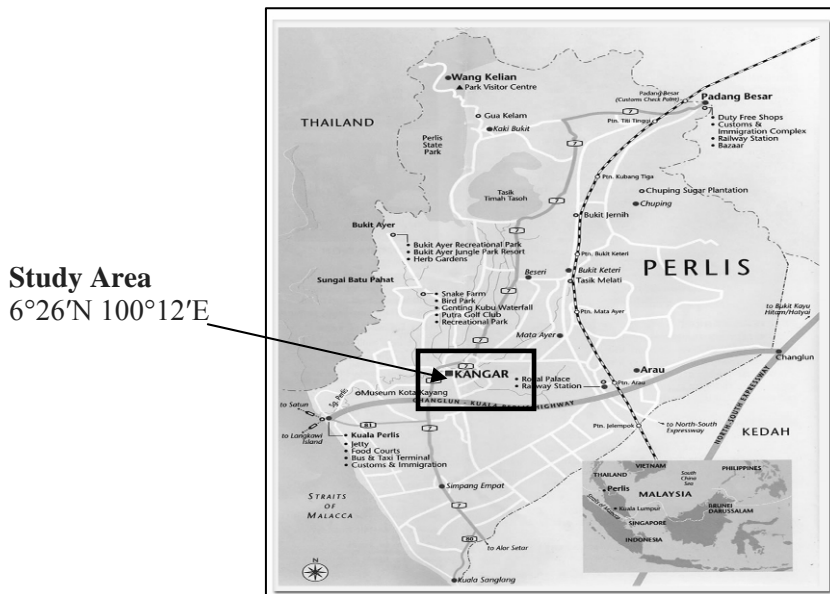


Figure 3: State of Perlis
(Source: www.perlis.gov.my)

Georeferencing is the process of stretching the raster image that controlled by the control point in the truth ground positioning. In the georeferencing process, the coordinate of the state of Kangar control points is acquire from the Google Street

Layer and the points used to rectify the base map into the actual location in the WGS84 coordinate system. All the information on accommodation surrounding Kangar Perlis collected from the Perlis Government official portal and the Ministry of Tourism, Perlis office. Then, the information is compile into the GIS database.

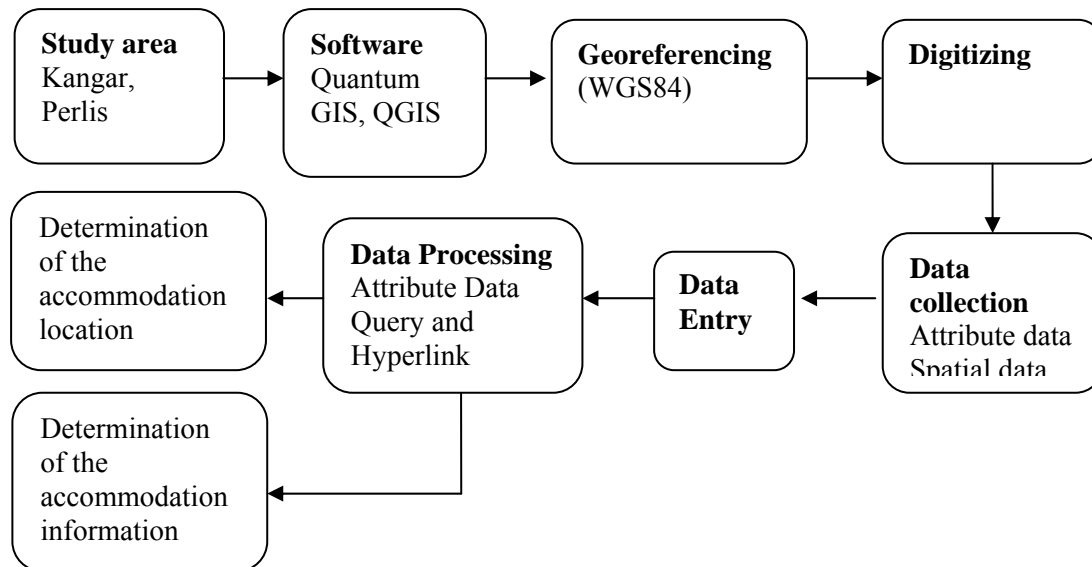


Figure 4: Conceptual Framework

The following table (Table 1) shows a list of attribute and digital data layers used for this study. The attribute data of road layer are the road name and their length while the accommodation information listed as name, phone number, coordinate, facilities, rate and full address of the place. The needs of accommodation coordinates are to help the local or foreign tourists to find the place using the electronic gadget such as their tablet PC and mobile phone.

Table 1: List of Spatial Layers and Attribute Data

Layer	Attribute
Accommodation	Name, Address, No Phone, Photos hotel, Coordinate, Type, Price_Night, TV&WiFi, Air_Cond, Bedroom, Other, Full Address
Fascinating Places	Type, Name, Address, Coordinate, postcode, District, State
Building	Name, Full Address
Road	Road Name, Length

In the study, the database query plugin function in QGIS is to find the location and information of the accommodation (hotel or homestay) including the facilities that meet the demand of tourists from the most fascinating places. Besides, the hyperlink tool is also used to show the real figure of the accommodation facilities using a multimedia approach such as pictures and videos.

The network analysis is one of the functions in the GIS to show the road direction either the shortest or fastest path. The network data structures consist of nodes (From Node, Fnode and To Node, TNode), a link (join two points by line feature) and stop (a location that visited along the path). Basically, there are several networks can analyzed using network analysis such as telecommunication cable, road network, electrical network, underground utility, etc.

In this project, the network analysis used to determine the path direction by considering the length of the road. Therefore, the road network needs to declare the X_From, X_To, Y_From and Y_To to show the road direction from the start (current place) and stop location (destination) (Figure 5).

	OBJECTID_1	OBJECTID	jalan	X_From	X_To	Y_From	Y_To
0	2	2	Jalan Seriap	100.182176095	100.175509039	6.416112842	6.427371959
1	3	3	Jalan Seriap	100.191131496	100.190153747	6.416116509	6.427741646
2	4	4	Jalan Seriap	100.190035987	100.190110263	6.42758518	6.426784197
3	5	5	Jalan Seriap	100.190035987	100.189951673	6.42758518	6.427579158
4	6	6	Jalan Seriap	100.189974014	100.190404286	6.43015007	6.430176152
5	7	7	Jalan Seriap	100.189196296	100.189750077	6.430322488	6.430477432

Figure 5: Coordinate of From Node (FNOTE) and To Node (TNODE)

Determination Of Accommodation Location

Using this project, tourists are able to find the homestay location using the coordinates provided through their electronic gadgets such as tablet PCs or mobile phone (Figure 6).

	hotel_home	Address	Coordinate
0	Putra Palace Hotel	135 Persiaran Jubli Emas, 01000 Kangar, Perlis.	100.203126 E , 6.444609 N
1	Seri Pulai Homestay	No. 11, Jalan Seri Pulai 4,	100.200568 E , 6.426522 N
2	Telok Kachang Homestay	Batu 3/4 Jalan Raja Syed Safi, 01000 Kangar, Perlis	100.183234 E , 6.441182 N
3	Guava Bay Homestay	Km 4, Taman Hiburan, Jalan Kurong Batang, 01000 Perlis	100.177436 E , 6.461104 N
4	88 Taman Hijrah Homestay	Kampung Guar Syed Alwi, 01000 Kangar, Perlis	100.200818 E , 6.426945 N
5	Federal Hotel	104B Persiaran Jubli Emas 01000 Kangar, Perlis	100.198010 E , 6.439211 N

Figure 6: Coordinate of Each Accommodation

In this study, the current location stated as the start location while the accommodation, “Noor Homestay” is declared as the stop location by determining in the database query plugin. Then, determination of road direction based on the distance factor in the shortest path plugin.

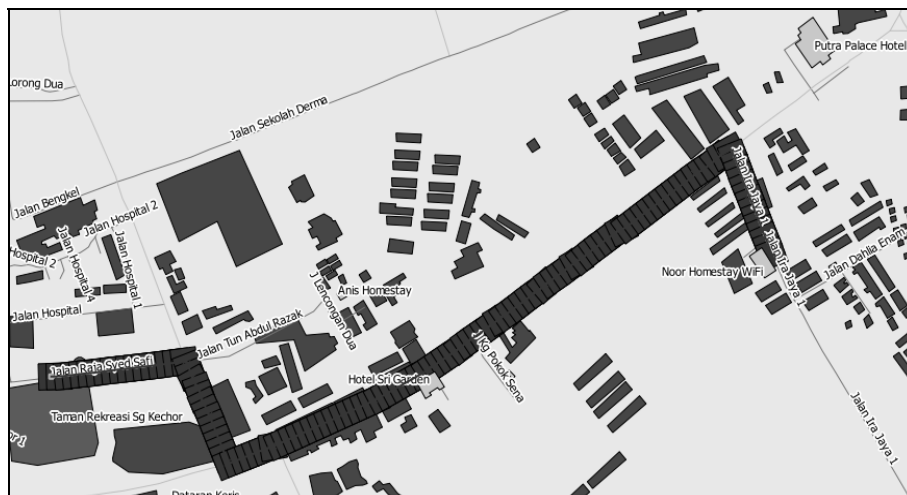


Figure 7: Shortest Way From Start and Stop Location

Figure 7, the thickest line displayed on the map showing the shortest path from the current location to the new destination. Moreover, tourists will be able to zoom and pan to the smallest information such as roads which they need to use to reach the locations.

Determination Of Accommodation Information

In this project, the database query plugin used to help the tourists to find the accommodation information, including the facilities that meet with needs before planning their trip. By using this project, the rate of accommodation can easily be found from the GIS database without the need to get access to the different web sources. If they are searching for the accommodation rate, then the Structure Query Language (SQL) can easily be used by typing the expression such as Rate =< RM130. Figure 8 shows the result of the accommodation distribution around Perlis that is below than RM130. Furthermore, the provided phone number of the owner and the full address of the accommodation is for booking purposes.

	hotel_home ▾	Address	Coordinate	No_Phone	Type	Price_Nigh
0	Seri Pulai Hom...	No. 11, Jalan Se...	100.200568 E , 6...	012-5611451 / 0...	Homestay	130
1	Azi Homestay	No 9, Jalan Dah...	100.203466 E , 6...	019-4342821	Homestay	120
2	Hotel Sri Garden	96 Persiaran Jub...	100.196791 E , 6...	+604-9773188 / ...	Hotel	130
3	Mahaji Homestay	NO.7, Jalan Ida...	100.180193 E , 6...	0123165823	Homestay	110

Figure 8: The Price and Coordinate Provided for Each Accomodation

Besides the rate, tourists can also use this application to find the most suitable accommodation in terms of facilities (bedroom, air-conditioning or fan, TV, wi-fi and, etc.) criteria that meet their needs as showed in Figure 9.

Bathroom	Air_Cond	Bedroom ▲	Others
Yes	Air-Cond	2 air-cond bedrooms	7-eleven, shop, banking service, restaurant
Yes	Air-Cond and Fan	2 bedroom with Air-cond	semi-D house
Yes	Air-Cond	2 bedrooms	parking, meeting room, lif
Yes	Air-Cond and Fan	2 room air-cond, 1 room wi...	kitchen, iron
Yes	Air-Cond and Fan	2 toilets, 2 wide living room	1 dinning, fully furnished, 2 wide living room
Yes	Air-Cond	3 bedrooms	kitchen, parking

Figure 9: List of Accomodation Facilities

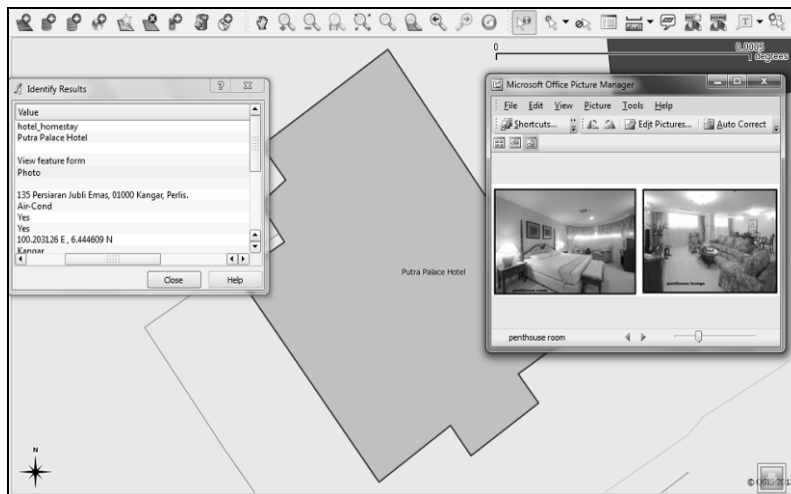


Figure 10: Real Image of Each Accommodation Facilities

The used of Hyperlink button is to link the spatial location to display an image and the video of the accommodation providing facilities using the multimedia approach. It will help the tourists in decision-making because the image displayed shows the real condition of the room and the existing facilities provided by hotels and homestay operators as showed in Figure10.

Conclusion

Tourism has become an important activity, with other economic sectors such as business and industry where the emphasis is given to tourism product of culturally based, arts and rural tourism. Thus, application of GIS is vital as an aid in an effective decision-making in tourism planning. Although the navigation devices are widely used, the weakness of the technologies still poses a problem in meeting the needs of tourists in terms of giving the detailed information about the accommodation and provided facilities. The project will further promote accommodation to tourist in Perlis using GIS application and this will contribute to the incremental of the economy in the Perlis tourism sector.

Acknowledgement

Special thanks to the Ministry of Tourism, Perlis that has kindly helped us with detailed information for this study.

References

- Abdul Jalil, R. (2007). *Map Navigation for Mobile Tourist*. UiTM Malaysia.
- Davis, J.S.,Morais D.B. (2004). *Haction and Enclaves: Small Towns and Socially Unsustainable Tourism Development*. Journal of Travel Research 11(2)189-204
- Duran,E., Seker, D.Z. and Shretsa, M. (2004). *Web-Based Information System for Tourist Resort: A Case Study on Side/Manavgat*. Istanbul Technical University, Istanbul, Turkey.
- Department of Statistic, Malaysia. Retrieved June 8, 2012 from <http://www.statistic.gov.my>
- Elliott-White, M. P. (2012). *Growing in Sophistication : The Application of Geographical Information Systems in Post- Modern Tourism Marketing*. Journal of Travel & Tourism Marketing , 37-41.
- Giles,W. (2003). *GIS Application in Tourism Planning*. GIS Seminar.
- Jovanovic, V., & Njegus, A. (2008). *The Application of GIS and Its Components in Tourism*. Yugoslav Journal of Operations Research , 261-272.
- Kang-Tsung Chang, (2008). *Introduction to Geographic Information System*. McGraw Hill, Fourth Edition.
- McAdam, D. (1999). *The value and scope of geographical information system in tourism management*. Journal of Sustainable Tourism, Vol. 7. No. 1.
- Morais, D.B., Dong E., & Yang, G. 2006. *The Ethnic Tourism Expansion Cycle: The case of Yunnan Province, China*. Asia Pacific Journal of Tourism Research 11, (2)189-204.
- Mokhtar, E.S., Zainal, N., Abdul Wahab,S.M., Yusof, N.A. (2012). *GIS Approach in promoting Perlis Tourism*. Proceeding paper International Hospitality and Tourism Conference, UiTM, Malaysia.

- Oxford Fajar (2003). *New Oxford English-English-Malay Dictionary*. Oxford Fajar Sdn. Bhd., Shah Alam.
- Pan, B., Crots, J.C. and Muller, B. (2007). *Developing Web-Based Tourist Information Tools using Google Map*. *Information and Communication in Tourism 2007*, p. 503-512.
- Quantum GIS User Guide. Retrieved April 7, 2012 from <http://qgis.osgeo.org/documentation/manuals.html>
- Sadoun, B. and Al-Bayari O. (2009). *A GIS System for Tourism Management*. Proceeding paper International Conference IEEE/ACS, p. 226-232.
- Wan Mamat, W.B. (2009). *Tourism Malacca Management System*. UTEM, Malaysia.