

THE ADOPTION OF GEOGRAPHICAL INFORMATION SYSTEM (GIS) TO
EASE THE CUSTOMER IN LOCATING SME BUSINESS PREMISES ALONG
JALAN HANG TUAH MALACCA

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“I declare that this project is the result of my own research except as cited in the references. The research project has not been for any degree and is not concurrently submitted in candidature of any other degree.”

Signature :

Name :

Date :

DEDICATION

I would like to dedicate the success of the Chapter 1, 2, 3, 4 and 5 of this project report especially to both of my parents, Mohd Sani bin Rosli and Masitah binti Mohamed. The hard work and sacrifices that they had made for me to further my studies would not be enough to pay back by just submitting the report but beyond that. Therefore, I am proud and honoured to have them as my parents. Secondly, dedication to all my siblings that has aid me a lot in term of spirit support. Last but not least, to my lecturer whom also my supervisor for this Final Year Project Report, Dr. Yusri Bin Arshad, my panel En. Amir bin Aris and also my Projek Sarjana Muda (PSM) friends.

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ABSTRACT

This research examines the adoption of Geographical Information System (GIS) to ease the customer in locating SME business premises along Jalan Hang Tuah Melaka. It aims to identify the benefits of using GIS software by customer to find the SME business in Malacca, determine the factor that ease the customer in adopting GIS software, and to examine the most affecting factor in adopting GIS software. To meet the objectives, the theoretical framework has been developed. The method that will be used during survey is using questionnaires that consist of likert scale type of question and the scope of the survey is respondents around SME business premises along Jalan Hang Tuah Melaka to collect the quantitative data for analysis. The pilot test will be conduct by having the small group of respondent give an answer on what they understand about the question in the questionnaires. The data from pilot test will be analysed using the SPSS software to calculate the Cronbach's alpha for its reliability. After that, the real research survey will be conduct by distributing the questionnaires to the respondents and the data will be analysed using the SPSS software to calculate the Cronbach's alpha for its reliability, Pearson product-moment correlation coefficient for measuring the linear correlation between two variables X and Y, and linear regression for calculating the significant. Discussion will be conduct from the analysis data and recommendation and conclusion will be made out of it.

ABSTRAK

Kajian ini mengkaji penggunaan Sistem Maklumat Geografi (GIS) untuk memudahkan pelanggan dalam mencari premis perniagaan IKS di Jalan Hang Tuah Melaka. Ia bertujuan untuk mengenal pasti faedah-faedah menggunakan perisian GIS oleh pelanggan mencari perniagaan PKS di Melaka, menentukan faktor yang memudahkan pelanggan dalam menggunakan perisian GIS, dan untuk memeriksa faktor yang paling mempengaruhi dalam menggunakan perisian GIS. Bagi memenuhi matlamat ini, rangka kerja teori telah dibangunkan. Kaedah yang akan digunakan semasa kajian adalah menggunakan soal selidik yang terdiri daripada soalan jenis skala likert dan skop penyiasatan ini ialah responden sekitar premis perniagaan IKS di Jalan Hang Tuah Melaka bagi mengumpul data kuantitatif untuk dianalisis. Ujian perintis akan dijalankan dengan mempunyai kumpulan kecil responden memberikan jawapan kepada apa yang mereka faham tentang soalan dalam soal selidik ini. Data yang diperolehi daripada kajian rintis akan dianalisa menggunakan perisian SPSS untuk mengira alfa Cronbach untuk kebolehpercayaannya. Selepas itu, kajian penyelidikan sebenar akan dilakukan dengan mengedarkan soal selidik kepada responden dan data akan dianalisis dengan menggunakan perisian SPSS untuk mengira alfa Cronbach untuk kebolehpercayaan, Pearson produk pekali korelasi momen untuk mengukur korelasi linear antara dua pembolehubah X dan Y, dan regresi linear untuk mengira ketara. Perbincangan akan dijalankan daripada data analisis dan cadangan dan kesimpulan akan dibuat daripada itu.

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CHAPTER 1: INTRODUCTION

TOPIC: The Adoption of Geographical Information System (GIS) to ease the customer in locating SME business premises along Jalan Hang Tuah Malacca

1.1 Introduction

A geographic information system or geographical information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data. The acronym GIS is sometimes used for geographic information science (GIScience) to refer to the academic discipline that studies geographic information systems and is a large domain within the broader academic discipline of geoinformatics. The term describes any information system that integrates, stores, edits, analyzes, shares, and displays geographic information. GIS applications are tools that allow users to create interactive queries (user-created searches), analyze spatial information, edit data in maps, and present the results of all these operations. Geographic information science is the science underlying geographic concepts, applications, and systems. One of the Global Positioning System (GPS) functional tool such as Google Map are associated with the small and medium-sized enterprises (SMEs) businesses providing satellite imagery, street maps, 360° panoramic views of streets (Street View), real-time traffic conditions (Google Traffic), and route planning for traveling by foot, car, bicycle in beta, or public transportation, and an API that allows maps to be embedded on third-party websites, and offers a locator for urban businesses and other organizations in numerous countries around the world that influence the easiness of customer in finding the small and medium-sized enterprises (SMEs) businesses location. The discussion in this chapter started from the definition of the problem, question that arises, the objective to be achieved, the significance of the study, the scope of the study and also the limitation of the study.

1.2 Background Of Study

This research seeks to determine the impacts of GIS adoption on the easiness of customer to locate the SME business premises along Jalan Hang Tuah Malacca. The motivations of the research arise from various impact encountered by the implementation of Google Map software on the large business company. The designs of effective GIS software such as Google Map in are deemed to have minimized the negative impacts of the easiness of customer to locate the SME business premises in the future. Google Inc. acquired digital mapping company Keyhole in 2004, and launched Google Maps and Google Earth in 2005. Today Maps also features live traffic, transit directions and street-level imagery, and Earth lets you explore the ocean and the moon. Google Maps provides directions, interactive maps, and satellite/aerial imagery of many countries. Google Maps can also search by keyword such as type of business. (Google Company, 2015). Using the Google Maps API to relay information is all well and good, but, how best to impart information and in this case experience, to the user? The purpose of geovisualisation, which one would argue is just as valid in the world of API, is firstly to engineer a landscape on to which an icon-set of geographic characteristics can be overlain and subsequently to allow a means to obtain secondary data which is enmeshed with that landscape or those icons (Meng, 2009). Clearly then, good cartographic design is required within that geovisualisation to successfully impart the information, or here, the experience – as Meng (2009) puts it, there is a need to develop a ‘visual literacy’ between the programmer and the end-user. Essentially, if the user doesn’t understand it, then there is little pointing in the undertaking. Moreover, in an age of multimedia web cartography users increasingly expect to be able to enter into the world of the map, in both figmental and geographic terms (Cartwright and Peterson, 2007). Google Map users can now view locations in peninsular Malaysia in great detail with Google Malaysia’s newly-improved Street View feature. They can zoom in for a close look at Pulau Langkawi, Malacca, Pulau Pangkor, Penang, Putrajaya or anywhere else in the country from a computer or smartphone. “This will have great tourism and economic impact because one in five Google searches is location based,” said Google Malaysia managing director Sajith Sivanandan. (Sukumaran, T, 2014).

1.3 Problem Statement

Small and medium-sized enterprises (SMEs) can be divided into three sectors which are manufacturing, services and agriculture. But most small and medium-sized enterprises (SMEs) businesses have a problem in term of providing an exact location of their business store. Because the small and medium-sized enterprises (SMEs) is still new and young in the business market therefore the location of the business are still not known widely in the market whether in domestic or global range. This can be a huge problem to the small and medium-sized enterprises (SMEs) because the customer not only still do not know full well of the small and medium-sized enterprises (SMEs) to give a full trust in them but also the location of the business location itself sometime are also hard to find so the number of sales to be made are also low because the customer cannot find the location of the shop. As small and medium-sized enterprises (SMEs) operates around the traditional lines, and a lot of factors increases their influence and causing a huge effect on the success of SME's no matter what is location of SME's and how strong is the market conditions are, influencing factor is always there for the small businessmen to anticipate these factors while doing the business. (Jasra et al., 2011). So the location is not the main factor that influences the success of small and medium-sized enterprises (SMEs) and the market condition are also not hugely influence the success of the small and medium-sized enterprises (SMEs). The literature is based on the success factors affecting the success of small and medium-sized enterprises (SMEs). It is obvious that hurdles in the business success are far more then it was in previous. The environments as well as and some other factors that are very complex and dynamic. The only thing that is more concerned to the small and medium-sized enterprises (SMEs) entrepreneur is what he should do to survive in a competitive market. The factors which we are concerned more in the literature are financial resources marketing strategy, technological resources, information access, and government support and business plan (Jasra et al., 2011). The small and medium-sized enterprises (SMEs) need to embark a more creative approach that will ease the customer to find the location of their shop by having the technological resources and information access such as the adoption of Google Map in their website or blog.

1.4 Research Question

A research question is an answerable inquiry into a specific issue. It is the first step in a research project. As the initial step, when we have an idea of what we want to study, the research question is the first active step in the research project. This research will cover the following questions:

1. What is the benefits use of GIS software by customer to find the SME business in Malacca
2. What is the factor that ease the customer in adopting GIS software
3. What is the most affecting factor in adopting GIS software

1.5 Research Objective

According to Saunders et al. (2012), research objectives will express ‘how’ we intend to structure the research process to answer your question. Furthermore, the objective should also relate with the questions as it affect the results at the end of this research. This research objectives have been designed by the researcher based on the research topic and research problems. The objectives of the study are stated below:

1. To identify the benefits of using GIS software by customer to find the SME business in Malacca
2. To determine the factor that ease the customer in adopting GIS software
3. To examine the most affecting factor in adopting GIS software

1.6 Research Scope

The scope of this project is to adopt GIS software that will improve the easiness of the customer in locating the SME business location in Malacca based on the objective and to solve the faced problem as much as it can. Small and medium-sized enterprises (SMEs) around Jalan Hang Tuah Malacca whether it is an online business or a conventional business was chosen as the research target because it is a young and a still developing company that are suitable to make a research about this project. The populations of Malaysia citizen around Malacca that range from student to working people are chosen for sampling. The researcher implements the study by using the method of distributing questionnaire to the respondent. The scope level of the respondent is the target customer of the company.

1.7 Research Limitations

The researcher faces some constraints in term of data obtained from the respondents. This is because, the researcher are not able to check to determine whether respondents answered the questions given correctly and honestly or not. But, the researcher assumes that the respondent given the correct or best answer for each question. Researcher cannot conduct the study throughout the whole Malaysia. Hence, researcher decides to only cover the issues along Jalan Hang Tuah Malacca which would allow the process of getting the data more facilitate.

1.8 Significance of Study

1. This study is to define causes that affect to the easiness of the customer in locating the SME business location in Malacca by the adoption of GIS software. Knowing the factors or variables that affect adoption of GIS software will provide information on customer's easiness in locating the SME business location in Malacca.
2. Provide the potential factors that encourage SME business to utilize the GIS software in their social media or website as a tool for customer to locate their premises.

1.9 Structure Of Proposal

Chapter 1	From this chapter, it is about the introduction of what the researcher wants to research and study. It is including background of the project, problem statement, research questions, objectives and scope.
Chapter 2	From this chapter, the researcher will explain the literature review according to previous research and will shows the theoretical framework that relates with the research objective.
Chapter 3	From this chapter, the researcher will explain the method that will be used to implement the research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In this chapter, reviews of the previous researches project that are related with this project will be discussed. The information will be become additional source for the project in becoming more successful. To have a brief understanding of the researches related to the project, a few literature reviews had been done. This chapter will describe the related literature reviews. To facilitate the important contents rigged, researcher started writing the definition of the Google Map and SME which is the key to this research. This is followed by an overview of the problem in locating the SME business shop. Additionally, this chapter will also examine explicitly independent variables of culture, time management, ease of use and the efficiency with its relation with dependent variable, easiness for customer to locate the SMEs store location. In addition, the theoretical frameworks for this study were also reviewed to spur the research parallel its objectives.

2.2 Definitions of Terms

The several term used that related with the study such as Global Positioning System (GPS), Small and medium-sized enterprises (SMEs), Google Map, review of relevant theoretical model, and factor affecting the adoption.

2.2.1 Geographical Information System (GIS)

GIS is one of many information technologies that have transformed the ways geographers conduct research and contribute to society. In the past two decades, these information technologies have had tremendous effects on research techniques specific to geography, as well as on the general ways in which scientists and scholars communicate and collaborate (Kenneth E. Foote and Margaret Lynch, 1995). A geographic information system or geographical information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data (Roger Tomlinson, 1968).

The acronym GIS is sometimes used for geographic information science (GIScience) to refer to the academic discipline that studies geographic information systems and is a large domain within the broader academic discipline of geoinformatics. The term describes any information system that integrates, stores, edits, analyzes, shares, and displays geographic information. GIS applications are tools that allow users to create interactive queries (user-created searches), analyze spatial information, edit data in maps, and present the results of all these operations. Geographic information science is the science underlying geographic concepts, applications, and systems. The Global Positioning System is the responsibility of the Joint Program Office, a component of the Space and Missile Center at El Segundo, California. In 1973, the Joint Program Office was directed by the US Department of Defense to establish, develop, test, acquire, and deploy a spaceborne positioning system. The present navigation system with timing and ranging Global Positioning System (GPS) is the result of this initial directive. GPS was conceived as a ranging system from known positions of satellites in space to unknown positions on land, at sea, in air and space. Effectively, the satellite signal is continually marked with its

own transmission time so that when received the signal transit period can be measured with a synchronized receiver. The original objectives of GPS were the instantaneous determination of position and velocity such as navigation, and the precise coordination of time such as time transfer.

Since the Department of Defense is the initiator of GPS, the primary goals were military ones. But the US Congress, with guidance from the President, directed the Department of Defense to promote its civil use. This was greatly accelerated by the production of a “portable” codeless GPS receiver for geodetic surveying that could measure short baselines to millimeter accuracy and long baselines to one part per million (ppm). This instrument developed by C.Counselman and trade-named the Macrometer Interferometric Surveyor was in commercial use at the time the military was still testing navigation receivers so that the first productive application of GPS was to establish high-accuracy geodetic networks. (GNSS — Global Navigation Satellite Systems, 2008).

Geographically referenced data consist of any type of measurement or observation, whether analog or digital, which have a known distribution across the surface of the ground, and hence can be presented as a map. Data of this sort are fundamental to all phases of mineral exploration and involve geological, geophysical and geo-chemical data along with topographic maps, aerial photographs, remote sensed imagery, mineral occurrence information, land use maps, drill hole location maps and so on. Computer software programs designed to store, manipulate and present geographical data are known as geographical information systems (GIS) (Roger W. Marjoribanks, 1997).

The benefits of using GIS software has also been support by Bing Pan, John C. Crotts, and Brian Muller in their book ‘Information and Communication Technologies in Tourism 2007’ that saying the handheld tour guide is based on mobile phones with a GPS antenna to communicate with Google Map and deliver real-time and location-sensitive tourist information. Online Charleston trip planner combines destination specific information with Google Map to provide an interactive trip planning tool based on the map metaphor. The handheld tour guide is slow and unstable due to memory limitations and slow Internet connection provided by the mobile phone service. The online trip planner is being adopted by various hotels and conferences. The development effort demonstrated that Google Map API is a flexible

tool with reasonable speed for developing destination-specific online services. For mobile tools, the computing power and wireless connections of small devices are the bottlenecks when communicating with online services (Bing Pan, John C. Crotts, Brian Muller, 2007).

2.2.2 Google Map

Google Map is software developed by Google Inc. that is an American multinational technology company that specializing in Internet-related services and products that founded by Larry Page and Sergey Brin who met at Stanford University in 1995. By 1996, they had built a search engine initially called BackRub that used links to determine the importance of individual webpages and Incorporation at 4th September, 1998 based at 1600 Amphitheatre Parkway, Mountain View, CA 94043, United States. These include online advertising technologies, search, cloud computing, and software Google Maps is a desktop web mapping service developed by Google. It offers satellite imagery, street maps, 360° panoramic views of streets (Street View), real-time traffic conditions (Google Traffic), and route planning for traveling by foot, car, bicycle in beta, or public transportation. Google Maps began as a C++ desktop program designed by Lars and Jens Eilstrup Rasmussen at Where 2 Technologies. In October 2004, the company was acquired by Google, which converted it into a web application. After additional acquisitions of a geospatial data visualization company and a real-time traffic analyzer, Google Maps was launched in February 2005. The service's front end utilizes Javascript, XML, and Ajax. Google Maps offers an API that allows maps to be embedded on third-party websites, and offers a locator for urban businesses and other organizations in numerous countries around the world. (Google Maps APIs, 2015).

Google Inc. acquired digital mapping company Keyhole in 2004, and launched Google Maps and Google Earth in 2005. Today Maps also features live traffic, transit directions and street-level imagery, and Earth lets you explore the ocean and the moon. Google Maps provides directions, interactive maps, and satellite/aerial imagery of many countries. Google Maps can also search by keyword such as type of business. (Google Company, 2015). Using the Google Maps API to relay information is all well and good, but, how best to impart information and in this case experience, to the user? The purpose of geovisualisation, which one would argue is just as valid in the world of API, is firstly to engineer a landscape on to which an icon-set of geographic characteristics can be overlain and subsequently to allow a means to obtain secondary data which is enmeshed with that landscape or those icons (Meng, 2009).

Clearly then, good cartographic design is required within that geovisualisation to successfully impart the information, or here, the experience – as Meng (2009) puts it, there is a need to develop a ‘visual literacy’ between the programmer and the end-user. Essentially, if the user doesn’t understand it, then there is little pointing in the undertaking. Moreover, in an age of multimedia web cartography users increasingly expect to be able to enter into the world of the map, in both figmental and geographic terms (Cartwright and Peterson, 2007).

Google Map users can now view locations in peninsular Malaysia in great detail with Google Malaysia’s newly-improved Street View feature. They can zoom in for a close look at Pulau Langkawi, Malacca, Pulau Pangkor, Penang, Putrajaya or anywhere else in the country from a computer or smartphone. “This will have great tourism and economic impact because one in five Google searches is location based,” said Google Malaysia managing director Sajith Sivanandan. (Sukumaran, T, 2014).

Maps have always been important to people; from navigational charts to GPS devices, different kinds of maps have been around for thousands of years and have always played an important role in society. Recently Google took the unprecedented step of releasing maps of the planet for free, accessible to anyone, anywhere. Google Maps has made an amazing difference in how people use and interact with maps. For example, home buyers may use Google Maps to examine an area to buy a house. Other examples abound: TV news services use Google Maps to show their viewers the location of incidents; investigators use Google Maps to plan surveillance, and many people use Google Maps to get directions (Paul Darbyshire & Adam Darbyshire, 2010).

2.2.3 Small and medium-sized enterprises (SMEs)

Small and medium-sized enterprises (SMEs) businesses are largely growing nowadays in a huge amount of business being conducted. They are often described as efficient and prolific job creators, the seeds of big businesses and the fuel of national economic engines. Even in the developed industrial economies, it is the SME sector rather than the multinationals that is the largest employer of workers (Mullineux, 1997). This is also supported by a research done on small businesses in the United States by Dr. Charles Ou in June 2006, which indicated that U.S. small businesses numbered 23 million in 2003, and it employed about half of the private sector work force, and also produces about half of the nation's private sector output. Small and Medium Industries Development Corporation Malaysia (SMIDEC) classified small and medium-sized enterprises (SMEs) based on the yearly sales turnover or quantity of full time worker (Moorthy et al, 2012).

Malaysian small and medium-sized enterprises (SMEs) can be defined according to size, turnover and activity (Saleh, 2006). But most small and medium-sized enterprises (SMEs) businesses have a quite similar problem that is in term of providing an exact location of their business store to their target customer. Small and medium-sized enterprises (SMEs) can be divided into three sectors which are manufacturing, services and agriculture.

In the broadband economy, SMEs enjoy technology-supported opportunities to interact with customers in ways that were neither possible nor thinkable until recently. However, to effectively sustain SMEs' competitive position, technology must first meet the business needs of small enterprises. In this chapter, we discuss how broadband-driven mobile technologies can actually support SME business needs. In the first part of the chapter, we present examples from multi-year research focused on identifying SME business needs by mapping the technological evolution and investments of small enterprises that are at the forefront of IT adoption. In the second part of the chapter, we specifically introduce mobile applications and discuss how they can play a role in SMEs' competitive evolution. Finally, we cannot discuss an emerging topic such as broadband-driven mobile technologies without acknowledging issues related to security and privacy protection in the