KUKTEM INTERACTIVE MAP
(A COMPARISON BETWEEN STATIC AND INTERACTIVE MAP)

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ABSTRACT

Nowadays, many map developer are moving toward an electronics era by converting the static map to the electronic interactive map. It is because an electronics map offer more beneficial features such as data retrieval, attractive, great for fast orientation and the important things is the map must be easy to use and helpful. Besides, by implementing in the web base platform, it also can be use as a marketing tool for outsider's attraction for a promotion. However, this system had not been implementing yet in KUKTEM. So, the idea to transform the available static map into an interactive map had leaded in the process to develop this system. The system should have a usable interface by implementing location based query. The system will involve data visualization in order to perform the map in an interactive way. The expected result from this system is it will help KUKTEM community and outsiders to know more about KUKTEM which user can see KUKTEM in the interactive map.

ABSTRAK

Dewasa ini, kebanyakan pembangun-pembangun peta telah mula menerajui bidang penghasilan peta elektronik ataupun e-map. Hal ini kerana peta elektronik menawarkan banyak ciri-ciri menarik dan bermanfaat seperti kemudahan memanggil data dari fail data, lebih bersifat menarik, mudah dikendalikan pengguna dan berfungsi sebagai alat yang mesra pengguna. Selain itu, dengan pengaplikasian sistem berasaskan web, peta tersebut juga boleh dijadikan sebagai alat pemasaran bagi sesuatu tempat terutamanya tempat yang baru dibangunkan. Walaupun begitu, sistem ini belum lagi dilaksanakan di KUKTEM. Oleh itu, idea untuk menukarkan peta statik KUKTEM kepada Peta Interaktif KUKTEM telah terhasil. Sistem ini sepatutnya berjaya menghasilkan peta mudah digunakan di samping bersifat mesra pengguna. Peta Interaktif ini melibatkan pemaparan data secara grafik dan semua aplikasi adalah dijalankan melalui grafik tersebut. Keputusan yang diharapkan dengan penghasilan Peta Interaktif ini adalah untuk kegunaan semua pihak yang terlibat dengan KUKTEM, mahasiwa dan mahasiswi KUKTEM dan semua pihak yang ingin mengetahui KUKTEM secara maya.

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LIST OF ABBREVIATIONS

KUKTEM	Kolej Universiti Kejuruteraan & Teknologi Malaysia
KIM	KUKTEM Interactive Map
PHP	PHP scripting language
UIVM	University of Vermont's Campus
MySQL	Microsoft SQL Server Database
KL	Kuala Lumpur
SDLC	System Development Life Cycle
IT	Information Technology
OS	Operating System
XML	Extensible Markup Language
RIA	Rich Internet Application

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CHAPTER
1

INTRODUCTION

1.1 Overview

The usages of web base map system are very common now. The usage of interactive maps is and effective enhancement for the traditional static map. It is because the information organized by system which can interact with the user will help more in giving information. The information organized by system provides automatic, updated, fast and cost effective data organization. Data visualization is a process of putting data into visible form by creation of graphical images. The main advantage of visual presentation is its convenience for human perception (J.B Watson, 1922, pg 155-158).

Furthermore, multimedia element will help to turn the static map into an interactive, easy to use and give useful navigator to use the map. Interactive map is an overcoming method to replace the traditional map that only had a static mode. By using interactive map, people can navigate trough the system and it will guide user through the system. Besides, by using this interactive map, user can navigate through this system and it can reduce time respond in searching for a specific place. It is believed that human ability to gather information will increase when the information are given in an interactive way (Tapscott, 1998, pg 255-267). The Interactive Map System has created a new way to take advantage of the system to display graphic images, including maps and information about the image.

The interactive nature of the Interactive Map System allows people to create pages that put control over the creation and display of maps and other images into the hands of computer users. We believe that, as new high performance computers become available, the role of interactive maps should be widened. Currently, a map is used more and more as a tool for analysis of data rather than for illustrative or demonstration purposes. Such exploratory analysis requires adequately designed, highly interactive and transformable map displays (McLellan, 1996).

1.2   Problem Statement

Currently, there is no Interactive map yet had been implemented in KUKTEM Gambang. Therefore, we decided to create an electronic map with multimedia element to enhance the old static map that just only provides several data in a static mode. Besides, by using this interactive approach, user can navigate through the system and it is believe can reduce time respond in searching for specific places. Actually the current map in KUKTEM now just had been put statically on the map board. The map is static and only shows several general information's about all places in the campus. We believe by implementing the graphical data visualization element in this system, it will help to perform the map in the interactive way. This approach will provide and easy way because it is highly believed that can be easy understand compare to text data presentation (Tapscott, 1998, pg 255-267). Furthermore, by using the traditional static map, the eye capturing process need to cover all point of the map until the targeted data is captured. For an example, if the targeted area is situated at the up right side of the presentation, and the eye scanning start at the up left of the presentation, the eye scanning process to capture the targeted data need to cover almost all of the area until the targeted area is reached (refer Figure 1.1). This method will cause longer time taken or need to discover the area.
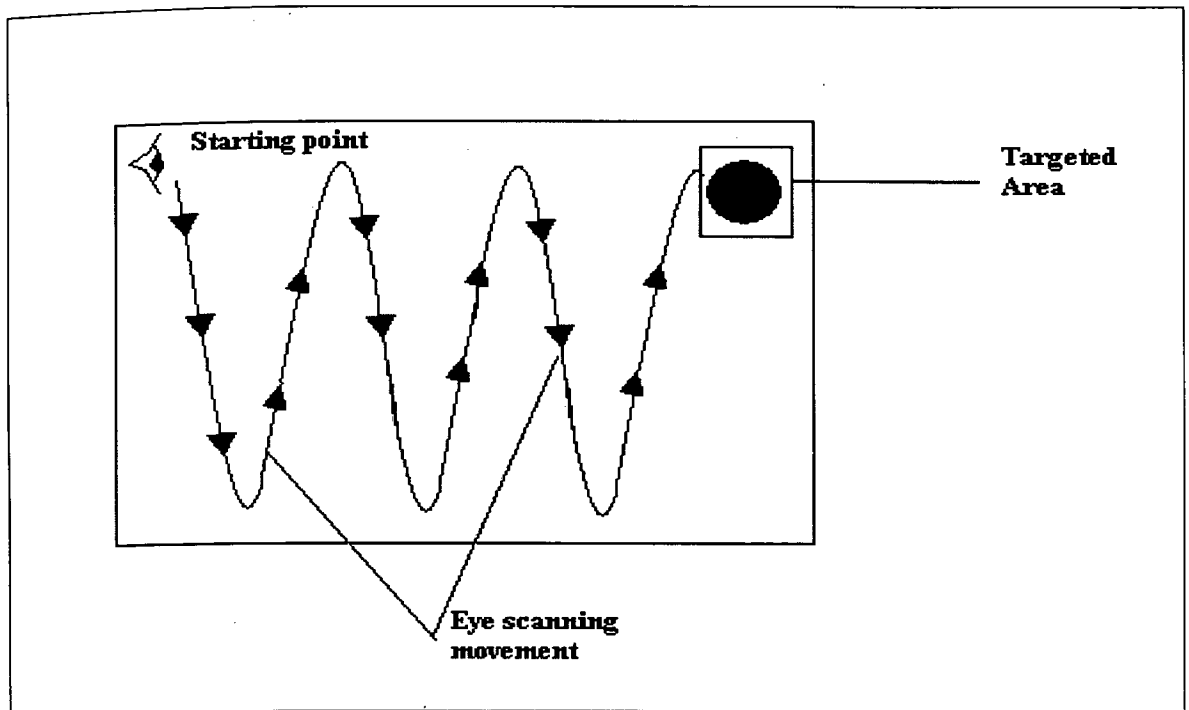
Figure 1.1   Normal eye-scanning processes

1.3   Objective

There are a few objectives that need to fulfill in developing the system. The objectives are as below:

- a) To increase the effectiveness of using KUKTEM's map by adding interactivity.
- b) To retrieve the data from data source and display it on the map.
- c) To develop a prototype of interactive map (KUKTEM Gambang)

1.4   Scope

The scope of my thesis is to develop the interactive maps which only consist of KUKTEM Gambang map only. To perform the data retrieval function and the map visualization, the focus is only on certain building due to time constrain. Those scopes are:

a) Increase 10% time response by adding a usability and attractivity on the map.

b) Object defined to retrieve data from data source in this project are cafeteria and C8 Student Hostel. Only consist of retrieve data, no update, insert data involved. The specific data retrieved are from XML files and MySQL database.

c) The prototype follows the current static map criteria with additional function.

   i.   Filter (Public Phone, Parking Area, Internet Access Point, Mosque, Astaka, Dining Area, Guard Post, Academic Building, Bus Stop and ATM.)

   ii.   Building Labeling (All building)

   iii. Road Guide (from second entrance to Mosque, Astaka, Cafeteria and Academic Building only)

CHAPTER
2

LITERATURE REVIEW

2.1 Introduction

This chapter takes a brief look at the sample of Static Map and Interactive Map which had already existed nowadays. This chapter also will discuss the comparison of static and interactive map and how graphical presentation affect the information capture process..

Humans are able to navigate through geographic space to their spatial-cognitive abilities, which have similar value in the exploration and understanding of non-geographic complex information. Maps are powerful graphic tools that classify, represent and communicate spatial or specialized relations. Maps are also a method to visualize and navigate a world that is too large and complex to be seen directly (Monmonier, 1996, pg 167-272). A map shows us more in less space, enabling us to plan our route in advance.

In order to understand the large geographical space into a smaller viewing mode, we need a map or set of maps for this purpose. When a specialized web information space is rendered in the form of an interactive map, the spatial representation (map) becomes the territory and also the means in which to navigate this territory. Links on such map are not just a representation of corresponding web resources, but can also directly launch (take users to) these resources. This is not

true for conventional real world maps, which were never meant to be the territory; they just allow users to visualize land and routes, then users will need to drive along to physically reach their destination.

An Image map is an image that contains multiple links within its borders. Basically it looks just like any other image you can see on the web. However, an image map contains several areas that once clicked on take the user to different locations (links). It can be said that an image map is navigation through picture.

2.1.1 History of Graphic Presentation

Long time ago, there wasn't any specific method to deliver message. People use many methods to deliver the message and they try to make it as easy as possible for others to understand what messages try to be sent. As there were no such thing like alphabet or character have been invented yet, they try to send the message by using graphical presentation.

This method lead to the use of sketch and image drawing to represent what the message try to be sent. For an example, in 35000 B.C. the Egyptians created a picture language called hieroglyphics. This is the first graphic presentation being found. The presentation is a cave painting to describe what they have observed in their daily activities such as painting of animal and human. Cave drawings were murals that people painted onto the walls of caves and canyons to tell the story of their culture (refer Figure 2.1). They would tell stories of battles, hunts and culture. Only in 3000 B.C. the Sumerian invented the first writing system (Phillip B. Meggs, 1998).

The method of deliver message or information by using graphic become very familiar and it is still being used until today.
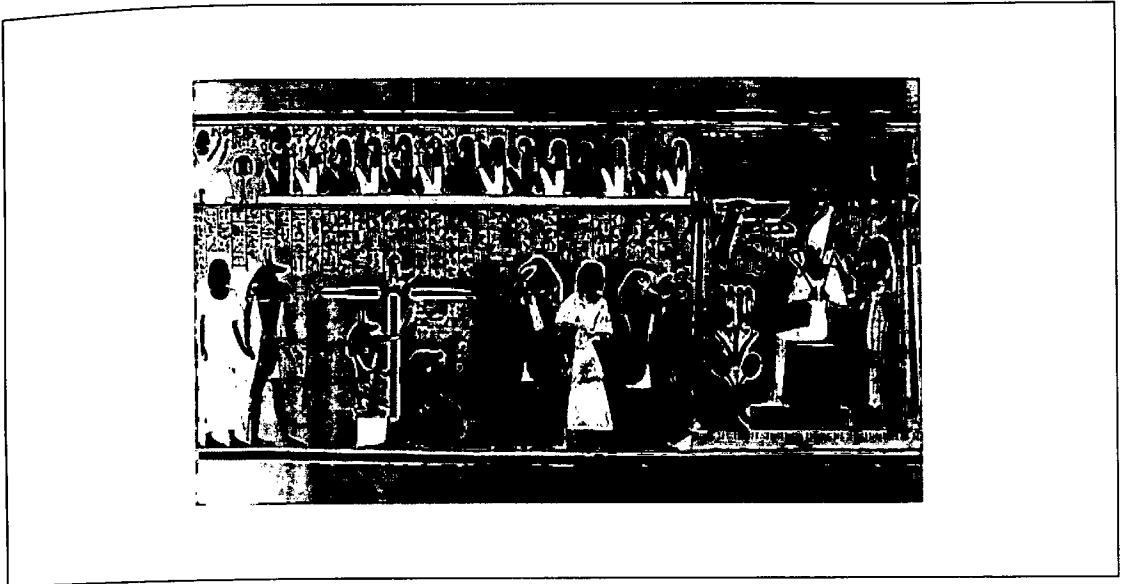
Figure 2.1 Egyptians cave painting (hieroglyphics)

Source:http://www.sallygentieuwelch.com/graphic.html/prehistoric.jpg

2.2 What is Static Map

Static map is map which is statically made in order to perform the map in small size visualization (Kimerling, 1997). Usually, this map will be put statically in the map board or printed in a peace of paper. The main different of static map between an interactive is the map is made in a static mode. So, user only can read it and cannot navigate trough it. Usually, the map views the building as a symbol. In this map, the use of symbols, shape, color and simple data is very important to perform the map.

2.2.1 What are the Static Map's features and benefits

Static map usually had been situated at the main entrance of the certain place. The main features of this map are to show the location inside the places. Usually, this map show the direction and the simple symbols were used to represent the thing shown in the map. The features of the static map are:

a) Usually are place in the map board.

b) Use symbols and simple shape to visualize the map.

c) Below the map, usually the map developer will give information about what are the symbols represent for.

d) Labels are used to represent the visualization.

e) Basic shape, color, and simple symbols always been use to represent the map.

2.3 What is Interactive Map

Interactive mapping is defined as any map in which the user can manipulate the display of the map, from simply zooming and panning on the map to querying, retrieve and analyzing the data displayed. The simplest interactive map system is image maps which are publish on the web (Thoen, 1995 pg 255-267).

The user should be able not only to display data in order to get an overview but also to use map visualizations to browse and manipulate data. Besides, a user should be able to select an object like an exhibitor on the fair from a list, to get a map on which the location of this object is highlighted, and to assign new attributes to this objects like being element of the user's tour or a point of interest. This requires the generation of the map view from a geographical database and the possibility to access this database by actions on the map view. The interaction design must provide intuitive means to perform the relevant actions on objects and to switch between list and map views. In interactive map, this was realized by a

context menu which offered actions on particular objects, like taking an exhibitor to a tour or displaying more detailed information.

2.3.1 Interactive Map's Features and Benefits

a) **Great for Fast Orientation**: Interactive map will give user great and fast orientation because user can navigate by just clicking on the image available.

b) **Great way to Link to Attractions**: Allow users to click to attraction descriptions in two ways: they can click on the map itself or on the name of the site in the list. It's more convenient that way.

c) **More than a Picture**: Many maps on the web are simply a scanned image, with hard to read lettering. Interactive map are designed for optimum computer viewing.

d) **Multifunctional**: Peoples may have seen maps on the Web where portions are hotspots linked to other pages. This is done by using the Flash action script function which usually involves the tedious manual job of defining the significant points which outline the overlaying graphic.

e) **Attractive**: Interactive map can be seen as more than a picture, user can navigate through the system by viewing the interactive picture and by using an interactive button. The whole map are using multimedia element that will make it more fun and easy to use.

f) **Show Road Guide:** User can use this interactive map as a location guide by choosing the where they want to go. The map then will generate the route that will show them how to go to that specific place. This will help user easily reach their destination. This feasibility will help user to save time by asking other people which is the right way to reach their target place.

2.4   Available System

2.4.1   Available Static Map

2.4.1.1 KUKTEM (Gambang)

Actually, there were 2 static maps available in KUKTEM Gambang campus. The first one is situated near the second guard post while another one is situated at Block X building. The static map only show general information, there is no detailed information included. The maps were statically put as a signboard for user to view the whole KUKTEM Gambang plan (refer Figure 2.2). The map is divided in three major zones, Zone 1, Zone 2 and Zone 3. The color of each boxes represent different building. The shapes also are different according to what building it represents. Below the map, there were labels which show the building name.
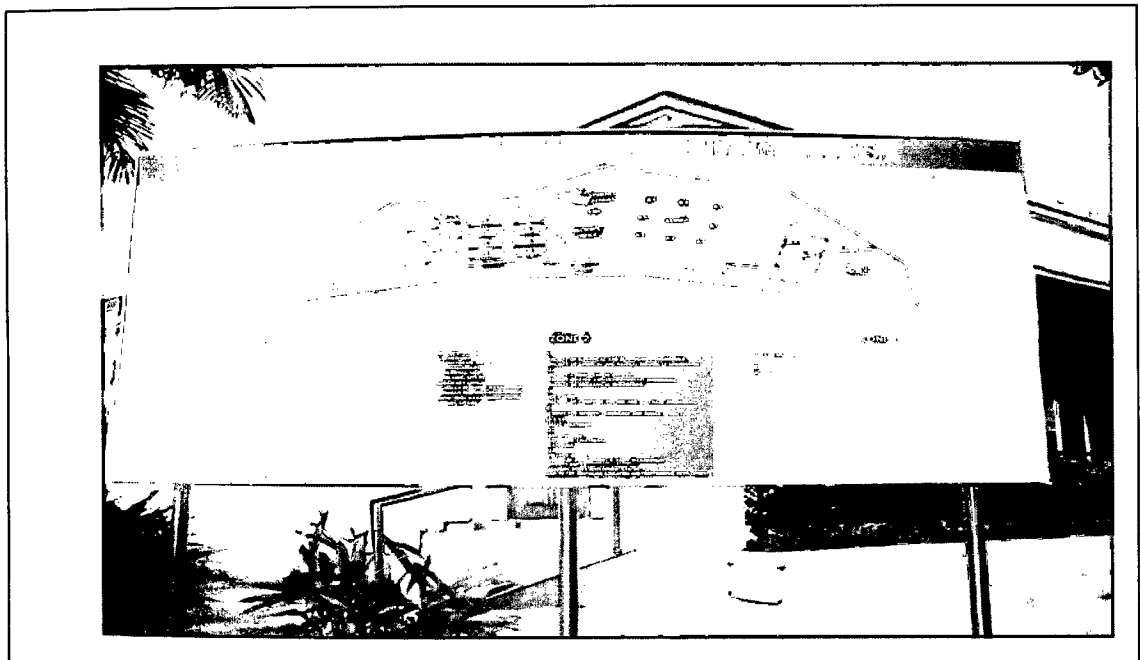

Figure 2.2   KUKTEM's Static Map

2.4.1.2 Shopping Complex

This map usually is situated near the lift, in front of the main entrance and available in every floor of the supermarket. Each map represent different plan according to each floor. The map in Figure 2.3 is the map of Kuantan Parade Shopping Complex.

Inside this map, it will show the whole plan of the level, store name, and what type of business available there. It will help user to search the specific store or location that they want to go. The map also is represented by using basic shape such as rounded, rectangular, squares and other else.
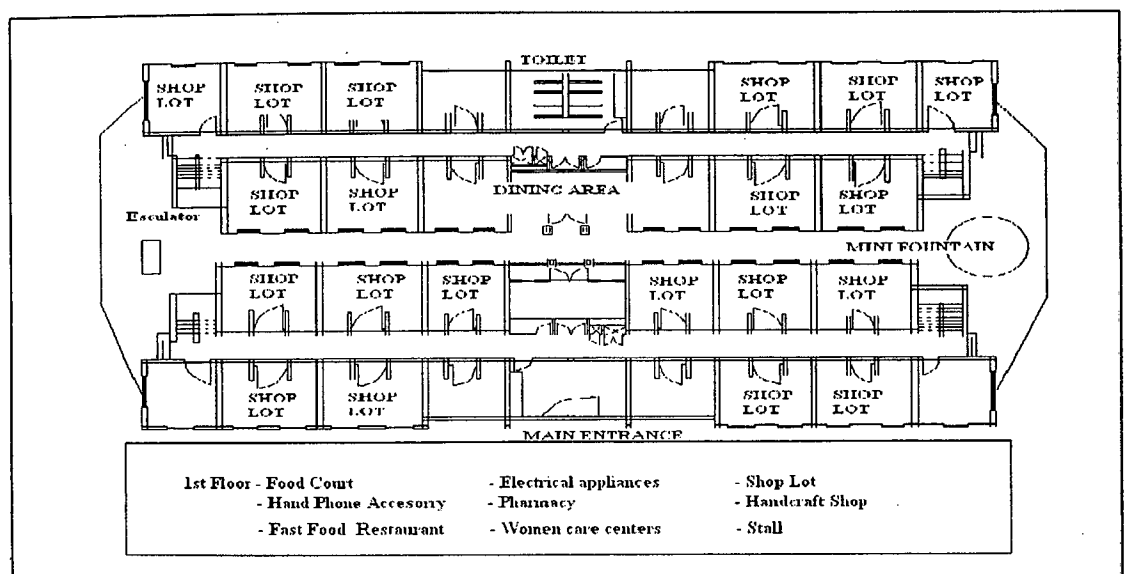

Figure 2.3 Kuantan Parade Building Map (1st Level)

2.4.1.3 Housing Area

Actually, not many developers provide the map for the housing area. Even the map are available, the information are only general are there is no details information about the certain house. This type of map usually is situated at the resident public hall or at the main entrance of the area. The map shows the whole housing area to make user easy view the whole plan. The map show the route in that area, house and building available in that area. For an Apartment or Condominium, the maps usually are place near the elevator so user can see it whenever they walk out from the elevator. Usually this type on housing area only provided the map at the main elevator and at the resident affair office. Figure 2.4 show the map of Taman Dato Haji Muslim.
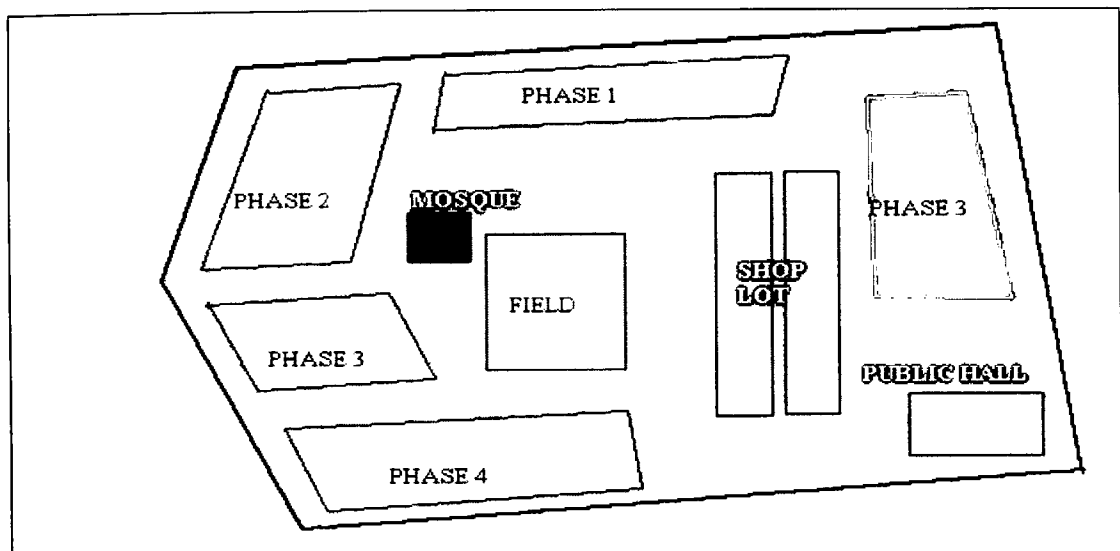

Figure 2.4   Housing Area Map (Taman Dato Muslim)

2.4.2 Available Interactive Map Systems
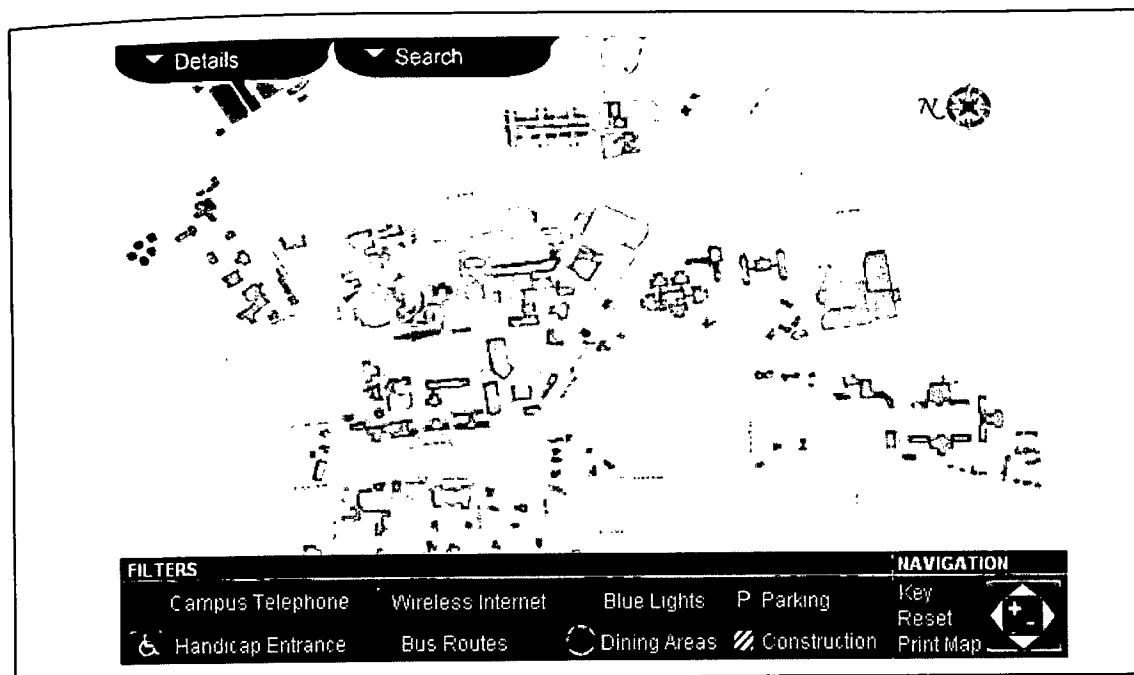
2.4.2.1 Universitas Viridis Montis Interactive Map

Figure 2.5 UVM Interactive Map

Source: http://www.uvm.edu/map/imap/

The University of Vermont's Campus Map (refer Figure 2.5) is an interactive information system for locating buildings and departments on campus. To operate the graphical map, user just need to click on the area they would like to see at a greater magnification. Navigation arrows, as well as zoom buttons, will appear. Navigation may occur through the use of the arrows and buttons or by additional clicks on the map. When an option is not available, it thus cannot be selected. (For example, at the most magnified level, the "Zoom in" button becomes faded). The "Locate" button will bring user to a database of buildings and departments to assist in locating the information user need.