Developing the Future: An Interactive Web Image-Based (IWIB) Virtual Tour Of UiTM Pahang

Anis Hasliza Abu Hashim
Mazliana Hasnan
Norfiza Ibrahim
Maslina Abd Aziz
Eelco de Vries

ABSTRACT

A virtual tour (or virtual reality tour) is virtual reality simulation of an actually existing location, usually comprising 2D panoramic images, image-based models of the real location, interactive or still images as well as other multimedia elements such as audio and text. Virtual tour is an immersive technology that places the viewers inside the image, enabling them to significantly enhance situational awareness and providing the highest level of functionality for viewing, capturing and analysing visual data. An interactive web image-based (IWIB) virtual tour of UiTM Pahang provides a tour with free navigation and immersive experience through the WWW. By putting the tour on the web, viewers could access to it from every where at any time. This paper describes the prototype developed for IWIB virtual tour of UiTM Pahang.

Keywords: *image-based, immersive, virtual reality, virtual tour, WWW*

Introduction

Virtual reality (VR) can be defined as "telepresence" or the "projection of a human mind to a remote site" (Larijani, 1994). Virtual Reality (VR) is a novel and innovative technology which allows us, through its applications, to experience abstract concepts and ideas, visit spaces that cannot be reached or no longer exist, and examine the objects from diverse and unique points of view. VR technology has already reached the level of maturity allowing it to be introduced into real life applications such as medicine, education and cultural heritage. Some researchers referred the VR as high-end user interface that involves "immersion, interaction and imagination" (Burdea & Coiffet, 1994).

The rapid changes in the current internet technology have contributed a lot to the development of the web-based virtual tour. This technology allows users to make the tour via Internet. Therefore, it has become a desirable and demanded application in many areas for various fields such as real-estate, tourism and education. Panorama-based virtual reality is an extension of computer graphics and virtual reality (Daniel Yi Xiao, 2000).

The first use and the derivation of the Virtual Tour was in 1994 as a museum visitor interpretation, providing a 'walk-through' of a 3D reconstruction of Dudley Castle in England as it was in 1550. This comprised of a computer controlled laserdisc based system designed by British based engineer, Colin Johnson. The system was named 'Virtual Tour, being a cross between Virtual Reality and Royal Tour (Virtual Tour, n.d.).

What is Virtual Tour?

A virtual tour is a means of presenting internet users with a full 360-degree view inside a property. This is achieved by taking a series of photographs and, using sophisticated software, converting these into an interactive 360 degree format so that the viewer can see the full picture. Virtual tour could be used to provide a unique view of a property or location which static photos alone cannot do and provide viewers with a sense of "being there". It could help the viewers of the website to become customer plus viewing the property without any interruption and in their own time.

Online Virtual Tours for Universities: An Overview

Virtual tours have become increasingly popular in recent times. It is especially useful for universities for providing information which will enhance the journey on the Internet. A survey by the Pew Internet & American Life project finds that 45% of online American adults have taken advantage of this internet application and taken virtual tours of another location online. That represents 54 million adults who have used the internet to venture somewhere else.

Nearly all institutions have websites; they offer course descriptions, information about the student population, application deadlines and costs. However, many colleges are doing more, offering virtual tour as a preview to the selected college visit. The tours typically combine still pictures and panoramic live shots from Webcams around campus. Their availability has grown where 975 institutions offer the virtual tour in 1997 (Begun, Bret, Stroup, Katherine, 2000).

Huntington University, for example, provides virtual campus tour in their interactive website. The facilities include Virtual Reality Tour, where they will bring users to explore their terrific campus with interactive panoramic images without requiring any plug-ins. As reported by Ryan Dezember from The Wall Street Journal published on October 2002, that 70% of all college-bound high-school juniors began their college search on the Web and virtual tours came second only to actual campus visits in luring students.

The main objective why universities use the virtual tour is to show close images of the campus environment in a better, clearer and more comprehensive way, so that could attract prospective students.

The Internet is one of the main tools to publish college information. Studies show that 94 percent of high-school students have Internet access, and they are not using it just to download Napster tunes but also download college information (Begun. et al., 2000).

According to a recent student POLL, students refer the Web more than guidebooks and catalogues. Research by Lipman Hearne shows that 80 percent of the college-bound population starts trolling around sites as sophomores, and that 53 percent of students used the Internet six times or more in September for college research (Begun. et al, 2000).

According to Molly Darnieder, Director of Campus Information and Visitor Relations at Cornell University, virtual tours are becoming a way for students to focus on the list of possible campuses to visit. In addition, virtual tour asssists students who cannot visit the campus for economic or geographic reasons or refresh their memories of campuses they had already visited .

In a nutshell, the benefits of virtual tour can be summarised as:

- new students can familiarise themselves with the Jengka campus, 24 hours a day, without the time, cost and inconvenience of travelling
- maintain visitors' interest in the website, increasing the likelihood of them making an enquiry which you can turn into a visit
- Convey more of the space, atmosphere and character of the campus facilities than traditional photos alone
- reduce students' fear of the unknown, and increase their trust and empowerment by allowing them to explore the campus locations freely
- allow visitors' behind the scenes' access to experience the campus facilities that are inaccessible or too dangerous to see in person

Virtual Tour for UiTM Pahang

A survey has been carried out by distributing some questionnaires to some students and the staff of UiTM Pahang and Arau on the need of virtual tour for the UiTM campuses. The prototype of IWIB virtual tour of UiTM Pahang has been demonstrated to these users in order to get their feedback. From the survey, it is found that UiTM Pahang should provide a virtual tour in the website. It is one of the alternative ways for the users to know more about UiTM Pahang and it can also be used to promote the campus to the public. The new students and their parents could have a good view on what the university looks like before coming for registration. They will have a clearer image of the campus.

UiTM Pahang has a lot of facilities unknown to the public. These facilities are available to be rented out to the public and could offer a good potential for business to the university. The facilities such as Sri Gading camp site. It is available to be used as a motivation camp. The virtual tour could show the area of the camp site to the viewers before they could confirm the booking. Other facilities such as herbal garden which is widely used by the researchers, palm oil and fruit plantation, wooden cottages (located in the Sri Gading camp site), multipurpose hall (usually used by public for official events) and many others.

The virtual tour could be used by the administration staff of UiTM Pahang to generate some potentials of improving the university in a more cost effective way such as to build another block of a lecture theatre. The combination of digital photos and virtual tours allows the UiTM Pahang management as well as the construction developers to get much deeper into the layout all the way through the campus. Then, they will decide for the next plan for the campus. Additionally, virtual tours could reduce the construction developer's traveling time. Although their company is situated faraway, yet by getting more clicks with virtual tours they still could come back to the building site more often.

Methodology

The methodology used for developing the prototype of IWIB virtual tour of UiTM Pahang is System Development Life Cycle (SDLC). The method was chosen based on its ability to ensure the planning of the development follows the schedule and its specifications.

The development process involved four phases:

Phase 1: Requirements Analysis and Specification
Phase 2: System Design
Phase 3: Development and Implementation
Phase 4: Testing and Maintenance

Phase 1, which is the requirement analysis and specification involved the investigation of the need to develop a virtual tour. A few factors need to be considered such as the time constraints, cost of development and tools (hardware and software). The flow of the tour was also identified to ensure the development is within the scope.

The following table shows the hardware and software requirements to develop the IWIB virtual tour of UiTM Pahang.

Table 1: Hardware and Software Requirements

Product	Use	Type	Vendor URL
Adobe Dreamweaver	Web authoring & production	Software	www.macromedia.com
Adobe Photoshop	Image editing	Software	www.adobe.com
Adobe Flash	Authoring tool	Software	www.macromedia.com
QTVR	Panorama image stitching	Software	www.apple.com
Canon digital camera	Image capture	Hardware	www.canon.com
Tripod	Stable base for photography	Hardware	

The second phase, which is the design phase, involved identifying the areas for the virtual tour. The map of UiTM Pahang Jengka campus (Figure 1) was studied to mark the area for developing the tour whilst the navigational chart (Figure 2) was drawn to ensure the correctness of the tour area.

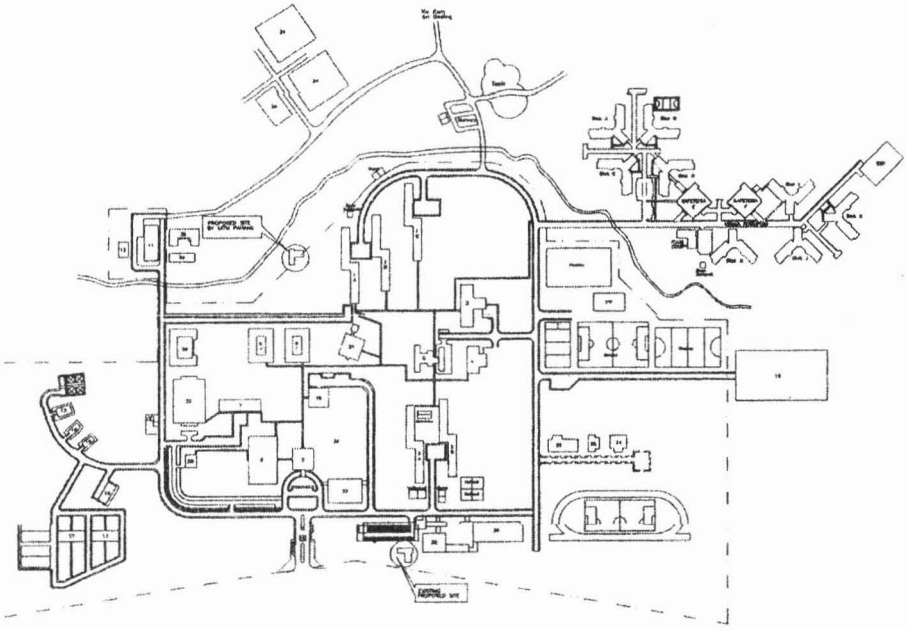

Figure 1: The Map of UiTM Pahang

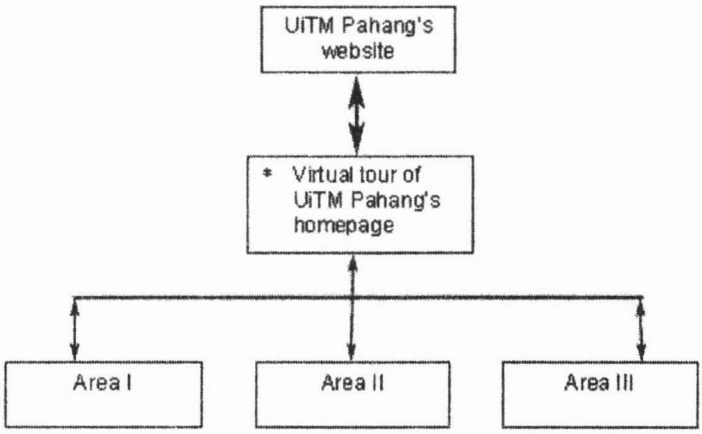

Figure 2: The Navigational Chart

After identifying the area, a storyboard was produced as guidance in the process of interpreting the elements involved in the virtual tour. The function of the storyboard is to guide the development of IWIB virtual tour of UiTM Pahang so that the progress will follow the schedule. This is to save time and costs of development.

The interactive map was designed after recognising the development area. The aim of IWIB virtual tour is to keep it simple and clear. The researchers have followed a few guidelines of producing a good user inter-

face design. The goal of the user interface design is to keep the user interface simple, intuitive and consistent throughout the whole tour. Thus, a few basic principles of user interface design to carry out the project were followed:

1) the principle of consistency;
2) the principle of aesthetic integrity;
3) the principles of see and point;
4) the principles of forgiveness and
5) the principles of simplicity.

The map of UiTM Pahang was then scanned and transformed into a digital form for editing purposes. Hot spots were added onto the map to generate the interactivity element.

The next phase is the third phase which involved the development and the implementation of the project. The development of IWIB virtual tour of UiTM Pahang followed the details of the design that had been specified. The specifications were based on the storyboard and the principles of user interface design.

The development of IWIB virtual tour can be divided into a few sections which are:

- development of virtual tour;
- development of the homepage, and
- development of the interactive map.

These sections can be simplified as in Figure 3.

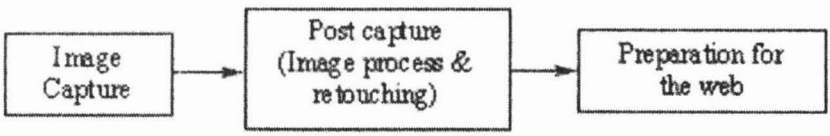

Figure 3: Process of IWIB Virtual Tour Development

The final phase involved testing and maintenance. The prototype of IWIB virtual tour of UiTM Pahang was tested by a few students and UiTM staff to ensure its accurateness and robustness. The respondents were provided with checklists which were then used for survey and

feedback purposes. The feedbacks from these users are important in order to improve and upgrade the virtual tour.

The IWIB virtual tour of UiTM Pahang was then placed in the homepage of UiTM Pahang http://www1.pahang.uitm.edu.my/UiTMtour/..

Recommendations and Conclusion

The IWIB virtual tour of UiTM Pahang is a multimedia application that makes the university stays on the cutting edge of the latest internet technology. The IWIB virtual tour can be used by the prospective and current students, visitors, faculties, and staff in locating resources and buildings on campus and have the overview of the campus. Users can look and evaluate the virtual tour as many times as they want without requiring assistance. The IWIB virtual tour is developed as user-friendly as possible so that users will not have any problem while viewing the tour.

The IWIB virtual tour can also be used to assist in generating extra income to the university. It can help the university to promote the facilities to the public such as the Sri Gading camp site, the herbal garden, fruit and palm oil plantation, multipurpose hall and others.

With enough budgets for the development of IWIB virtual tour, more areas can be added into the interactive map. Other multimedia elements such as sound could be embedded into the tour as this will give a real immersive experience to the users.

It is important for the university to have the virtual tour as this is one of the UiTM Pahang's strategic planning towards its excellence. With IWIB virtual tour, UiTM Pahang could stand as tall as the other universities locally and globally.

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ANIS HASLIZA ABU HASHIM, MAZLIANA HASNAN & MASLINA ABD AZIZ, Fakulti Teknologi Maklumat dan Sains Kuantitatif Universiti Teknologi MARA Pahang. anis@pahang.uitm.edu.my, mazliana@pahang.uitm.edu.my & maslina@pahang.uitm.edu.my.

NORFIZA IBRAHIM, Fakulti Teknologi Maklumat dan Sains Kuantitatif Universiti Teknologi MARA Perlis. norfiza@perlis.uitm.edu.my

EELCO DE VRIES, Dorpstraat 61, 3732HH, de Bilt, Holland. www.bitnet.com