

Development of 2D Animation Video for Visitors at UTHM

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Abstract

Visitor guidelines are crucial for maintaining safety, order, and a positive experience for both visitors and those being visited in various settings, including hospitals, correctional facilities, tourist destinations and also educational institutions like UTHM. Visitor guidelines are often communicated through signs, brochures, or online resources, providing visitors with clear instructions and expectations. Hence, this study is about the development of the 2D Animation Video for Visitors at UTHM to help them to explore the UTHM area easily. At the same time, this 2D animated video development serves as a medium to convey significant information related to the location and buildings that exist within the UTHM in detail. With the development of this 2D animated video, visitors can explore UTHM buildings, building information, and building locations. Visitors from a variety of ethnic groups, age backgrounds, and different levels of learning ability can recognize and understand building layout and information about building placement through visual exposure. The Waterfall Model is used as a study methodology to guide the entire process of developing this 2D animated video. Meanwhile, the testing and evaluation of this 2D animated video were carried out using a survey instrument, with four experts selected to conduct the functionality testing and design of this 2D animated video. Through the results of the studies carried out, all experts have given comments and suggestions for positive improvements to the 2D animated video that has been developed. Overall, these 2D animated videos can serve as additional information for visitors that can maintain their motivation of visitors to explore UTHM.

1. Introduction

A visitor who wants to visit something new needs a clear guide so that he can get to the desired destination exactly. Usually, visitors who want to visit some place for the first time such as educational institutions, government offices, hospitals and so on will be guided by digital maps, signboards, or ask oral questions to the people around them. Visitors from a wide range of ethnic groups, age backgrounds and learning abilities will likely face problems finding a location while visiting a new place. (Abdul Rasam, Aiman & Idris, 2020) The absence of signs and direction of the location, as well as the inaccuracy of location tracking by search apps such as Google Maps, will cause visitors to find something new. (Muhd Arifin, 2022). Visitors will also experience difficulties due to the lack of special guidance provided by the site. This will cause visitors to fail to get a complete picture of something new.

Video animation is an effective medium to convey information about a place. The use of animated video in the process of communicating information can improve the level of delivery and understanding, as animated

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videos are of an exciting nature. If this animated video has already attracted the attention of the public, then it is expected that information will be easily understood, as it involves many senses, especially the ears and eyes used to absorb the information (Achmad, Fanani & Wali, 2021). Multimedia animated videos can provide a pleasant effect and make it easier for the public to remember the information delivered. According to Taqiya, Nuroso & Reffiane (2019), information that is considered difficult to convey because it is too verbalist and requires visualization can be conveyed using animated videos.

In the context of this study, the visitors' 2D animated video at UTHM is a 2D-shaped animation video that was developed to make it easier for visitors to explore UTHM especially on important buildings. This 2D animated video development is considered an alternative for visitors to explore UTHM in addition to the use of digital maps. This 2D animated video also serves to channel building-related information to visitors creatively. The visual component of this 2D animated video is significant for visitors to gain an overall picture of the existence of a building in the UTHM. In addition, a clear narrative continuity in 2D animated videos will help visitors to understand UTHM. The application of suitable multimedia elements can also confirm some delivery and speed up visitors' understanding.

1.1 Research Background

A study conducted by Muhammad Affendi (2008) stated that generally address integration is only more focused on searching for the address of an area either by query or by reference to a map. Traditional methods are a problem and a burden on individuals who are not anxious about a particular area. In the same study, Muhammad Affendi (2008) explains that an individual will experience difficulties due to the absence of a specific application that can be used as a guide while visiting something new. This makes it difficult for individuals to identify the area or locations they want to visit more accurately. Although there are search apps like Google Maps and Waze, sometimes it doesn't show you the right direction. Thus, the development of visitor 2D animated video at UTHM is imperative as an alternative to visitors during a visit to UTHM. It can be made a guide that makes it easy for visitors to explore UTHM.

Raman (2006) found that some individuals struggle with controlling topographic skills, such as reading, interpreting, and identifying map symbols. These abilities vary among individuals, and not all can decode map information. To address this, 2D animated videos at UTHM can help visitors understand buildings and related information without relying on maps.

Moreover, the absence of animation elements in information delivery can make the process less interesting and boring, challenging audiences to focus on important content. This lack of visual and dynamic presentation can also hinder understanding. The development of visitor 2D animated videos using multimedia elements, such as text, audio, video, graphics, and animation, is essential for effective information delivery and improved understanding. Animation enhances the creative transmission of information, making it entertain and attracting audience interest. Multimedia also offers ease of storage and distribution, allowing the community to access information quickly and efficiently.

Traditional methods of information transmission without multimedia components are less suitable for learning due to the difficulty in implementing memory processes and adapting to new information. The development of visitor animation videos at UTHM can improve information access by combining text, graphics, audio, video, and animation. This approach helps individuals remember information by matching input with existing knowledge. 2D animation videos visually emphasize information presentation, forming complex memory patterns and increasing motivation. They also provide abstract and dynamic information, attract focus, increase interest and motivation, and deliver information quickly.

1.2 Problem Statement

The absence of a specific application for guiding visitors to new places is a significant issue, as it can be difficult for individuals to identify the desired area or location. The development of visitor 2D animated videos at UTHM is essential to provide a clear guide for visitors to explore UTHM. Additionally, the absence of animation elements can make information presentations less interesting and boring. The use of multimedia elements, such as text, audio, video, graphics, and animation, can enhance information delivery and improve understanding. Traditional methods without the intersection of multimedia components are less suitable for learning, as they require support in the short term. The development of visitor animation videos at UTHM will further enhance information access processes, allowing individuals to remember information by matching input with existing knowledge.

1.3 Objectives

There are three objectives to achieve in this study:

- a) Designing a 2D animation video for visitors at UTHM.
- b) Develop a 2D animation video for visitors at UTHM.
- c) Testing the functionality of the 2D animation video for visitors at UTHM.

2.0 Animation

Animation is a series of images that form and organize into a movement, describing situations at any time, such as day and night events. It has three main features: depiction, movement, and objects made by painting or simulation methods. Creating animation for learning purposes requires creativity and skills, as the human brain's memory capacity is crucial for its effectiveness. Previous animation knowledge also affects the effectiveness of the animation. Beginners with no prior knowledge are more likely to pay attention to interesting animation changes, while those with prior knowledge of UTHM can benefit from 2D animated videos that help deepen understanding.

2.1 Animation 2D

2D animation is a type of animation that involves separating objects using a virtual layer and driving them using key frames. It gives life to objects by moving their images at specific times, making them appear real and moving. 2D animations are typically seen from the front and can be produced using hand-drawn or cell animation techniques. Traditional animation techniques include cell animation, cut-out animation, and stop motion animation. Digital animation consists of two types: 2D and 3D, which involve basic objects across a screen, rotating in various angles, and exchanging shapes.

2.2 Video Animation

Animation is a technique that manipulates images frame by frame to create illusions and convey information. It involves three stages: pre-production, production, and postproduction. 2D animated videos involve characters or graphic images to describe a situation, with up to 50% of the video being heard and seen by the user. These videos can stimulate minds, attention, and interests, describe complex information in a simple and entertaining way, and engage users. Clear narratives and robust design help users understand and focus on the content. Using multimedia elements effectively, animation in videos can make the process of delivering information more enjoyable and motivating. The use of animation elements in Visitor 2D Animation Video at UTHM can improve audience understanding and speed up the information process.

3. Methodology

The important thing in the process of analyzing a study is to choose and determine the research methodology to be used for the purpose of implementing the product by the developer himself. In the context of this study, the developers have chosen the waterfall model design model as a study methodology in the development of visitor 2D animated video at UTHM. There are five main phases in the design of this waterfall model. These include the analysis and requirement phase, the design stage, the implementation stage, test phase and maintenance phase. (Gaurav, 2019)

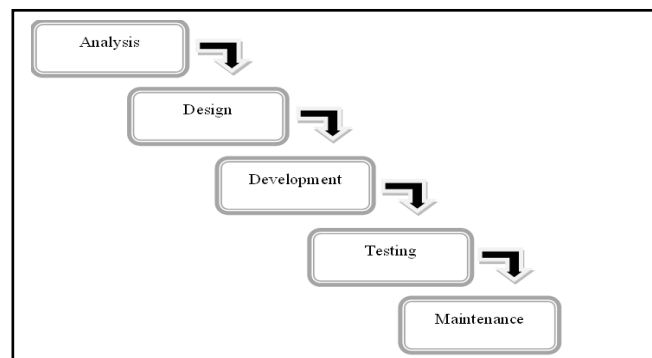


Figure 1 Waterfall Model (Reference: Widiyanto, Wantoro & Murtiyasa, 2018)

3.1 Analysis Phase

During the analysis phase, the developer analyzed the information collected. This phase is carried out to identify the weaknesses that exist in current 2D animated video by using desktop analysis from past researcher findings. There are a few weaknesses of current 2D animated like less dynamic and interactive issues and some of the video are more informative rather than visual and graphic weaknesses than that, developer also did some analysis about the content that should be put in the application. Since this research is about developing animation 2D for visitors to tour UTHM, then all the information was analyzed from many sources like material from library and also from the right department such as Security Department. This process is very important to consider the correct information presented. In addition to identifying the need in the development of 2D video animation, developers also identify problems, and the objectives to be achieved, identify target groups, as well as identify the software and hardware that has been used. The implementation of this phase can encourage developers to develop a 2D animated video that can meet the needs and requirements of users.

3.2 Design Phase

The design phase in the waterfall model involves interface design and development flow chart for visitor 2D animated videos at UTHM. Developers create rough sketches through storyboard construction, organizing ideas for the built-in interface. This phase covers multimedia elements, interface design, theme and color selection, and icon selection. Content design involves assembling content, clearly describing objectives, and considering functionality. The content should be easy to understand, accurate, and provide accurate information about the area's exploration. Expert feedback is crucial for creating content suitable for user use. In this phase, the developers should emphasize multimedia elements related to suit with the contents and objectives like animation, text, audio and graphics. In order to make sure that the contents achieved to target groups, developers design it with a good style of interactivity which emphasizes on human computers interactions principles like consistency, familiarity, short cut, feedback etc.

3.3 Development Phase

The third phase of the study involves developing the key elements from the design phase into practical forms. This phase involves using the storyboard design to create prototypes with hardware and software, ensuring product development is uninterrupted. The phase also tests the effectiveness of the prototype and incorporates multimedia elements like text, graphics, audio, video, and animation for visitors' 2D animated videos at UTHM.

3.4 Testing Phase

The testing phase at UTHM involves testing visitor 2D animated video products to identify issues and improve maintenance. Four experts, including interface and content experts, assess the product's success using a checklist form. Interface design assessments are conducted by creative multimedia lecturers and content design evaluated by UTHM Safety Officers. This process ensures the product meets development objectives.


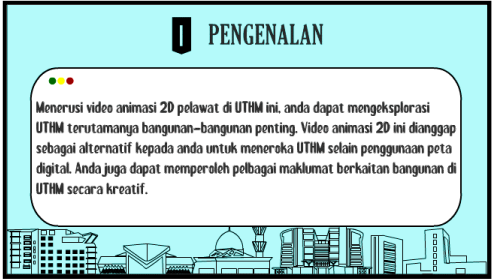


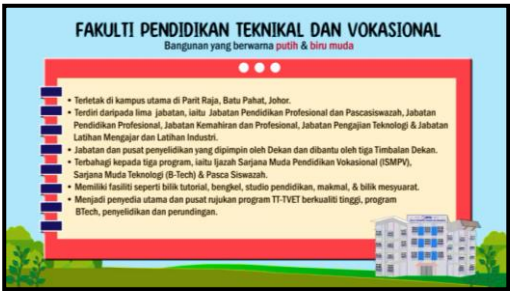
3.5 Maintenance Phase

The maintenance phase is the final phase used in this study. In this phase, the ready-made product developed by the developer will be presented informally to the evaluator. The aim is to test functionality and identify any problems that may not be found during the design and development phase. Any shortcomings and weaknesses found will be corrected and tested until it succeeds. Developers can make changes to products developed based on user feedback.


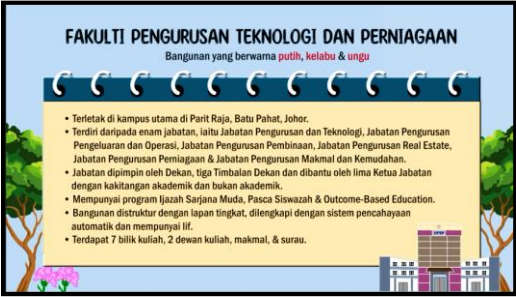

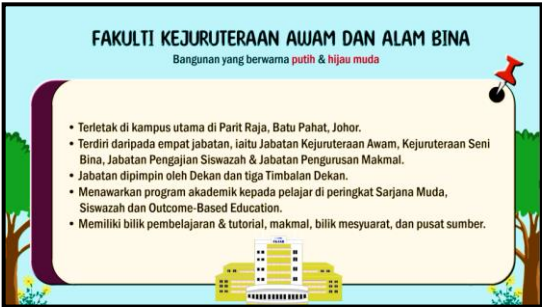

3.6 Development of 2D Animation Video for Visitors At UTHM

Interface design is a combination of a whole set of content, multimedia elements and several interactive elements. Table 1 shows the interfaces that had been developed.

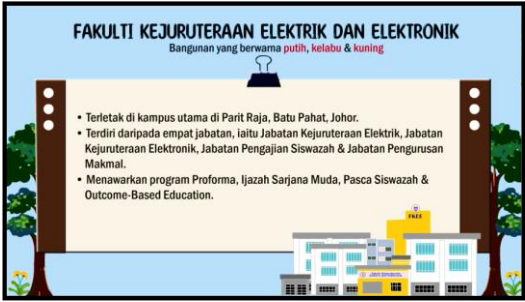

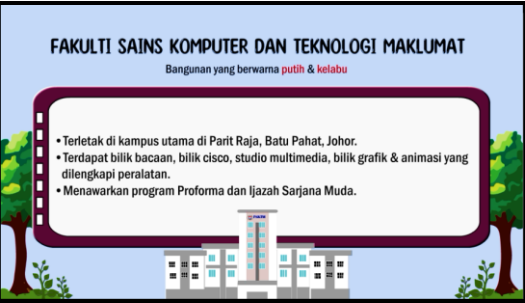


Table 1 Interface of the 2D Animation Video

Page Interface	Description
	<p>The main page of 2D animation video shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The introduction screen shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM buildings Audio – Background music “Good Vibes”.</p>
	<p>The screen page for “Lawatan Maya Sekeliling UTHM” shows the use of text, graphic, animation and audio.</p> <p>Text – Title and dialogue Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for FPTV shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of FPTV shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>

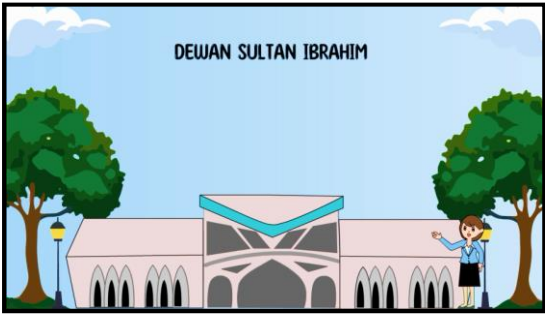


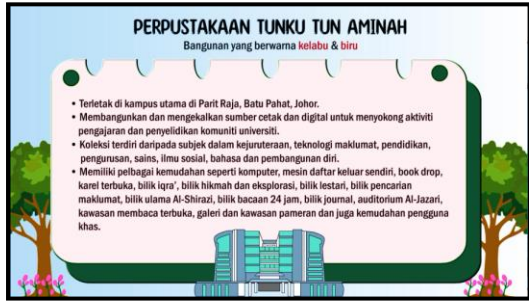

Continue **Table 1**

 <p>FAKULTI PENGURUSAN TEKNOLOGI DAN PERNIAGAAN</p> <p>FPTP</p>	<p>The screen page for FPTP shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
 <p>FAKULTI PENGURUSAN TEKNOLOGI DAN PERNIAGAAN Bangunan yang berwarna putih, kelabu & ungu</p> <ul style="list-style-type: none"> • Terletak di kampus utama di Parit Raja, Batu Pahat, Johor. • Terdiri daripada enam jabatan, iaitu Jabatan Pengurusan dan Teknologi, Jabatan Pengurusan Pengeluaran dan Operasi, Jabatan Pengurusan Pembinaan, Jabatan Pengurusan Real Estate, Jabatan Pengurusan Perniagaan & Jabatan Pengurusan Makmal dan Kemudahan. • Jabatan dipimpin oleh Dekan, tiga Timbalan Dekan dan dibantu oleh lima Ketua Jabatan dengan kakitangan akademik dan bukan akademik. • Menyempurnai program Ijazah Sarjana Muda, Pasca Siswazah & Outcome-Based Education. • Bangunan distruktur dengan lapan tingkat, dilengkapi dengan sistem pencahayaan automatik dan mempunyai lif. • Terdapat 7 bilik kuliah, 2 dewan kuliah, makmal, & surau. 	<p>The screen page for the information of FPTP shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
 <p>FAKULTI KEJURUTERAAN AWAM DAN ALAM BINA</p> <p>FKAAB</p>	<p>The screen page for FKAAB shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
 <p>FAKULTI KEJURUTERAAN AWAM DAN ALAM BINA Bangunan yang berwarna putih & hijau muda</p> <ul style="list-style-type: none"> • Terletak di kampus utama di Parit Raja, Batu Pahat, Johor. • Terdiri daripada empat jabatan, iaitu Jabatan Kejuruteraan Awam, Kejuruteraan Seni Bina, Jabatan Pengajian Siswazah & Jabatan Pengurusan Makmal. • Jabatan dipimpin oleh Dekan dan tiga Timbalan Dekan. • Menawarkan program akademik kepada pelajar di peringkat Sarjana Muda, Siswazah dan Outcome-Based Education. • Memiliki bilik pembelajaran & tutorial, makmal, bilik mesyuarat, dan pusat sumber. 	<p>The screen page for the information of FKAAB shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
 <p>FAKULTI KEJURUTERAAN ELEKTRIK DAN ELEKTRONIK</p> <p>FKEE</p>	<p>The screen page for FKEE shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>






Continue **Table 1**

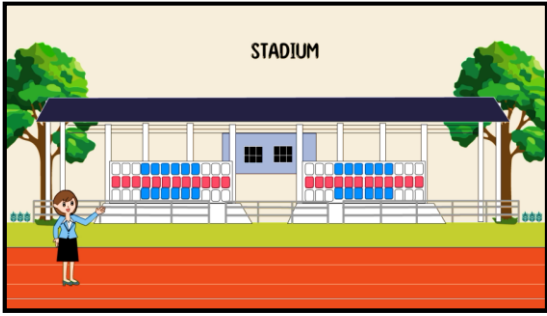


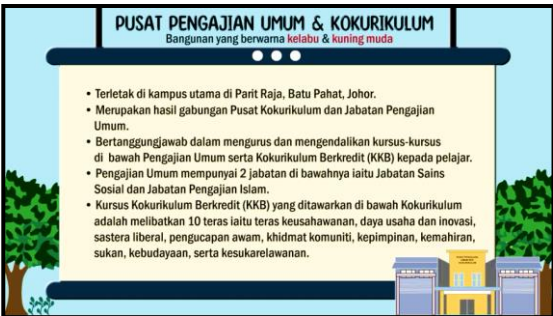

	<p>The screen page for the information of FKEE shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for FSKTM shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of FSKTM shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for FKMP shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of FKMP shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>



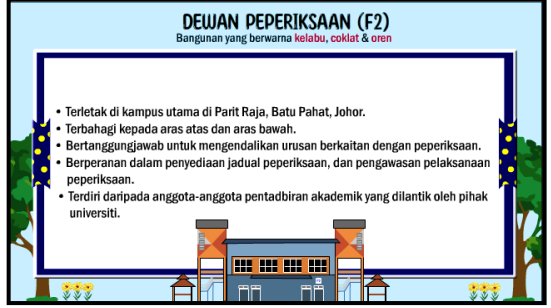

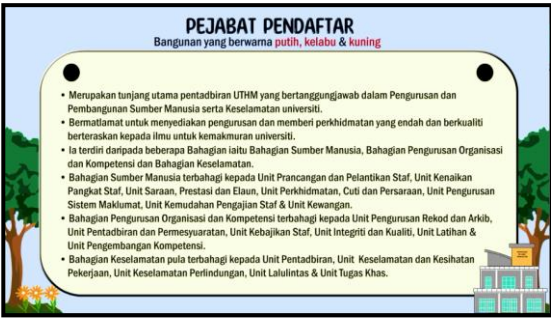
Continue **Table 1**

	<p>The screen page for “Dewan Sultan Ibrahim” shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of “Dewan Sultan Ibrahim” shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for PTTA shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of PTTA shows the use of text, graphics, animation, and audio.</p> <p>Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for “Pejabat Hal Ehwal Pelajar” shows the use of text, graphics, animation, and audio.</p> <p>Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>


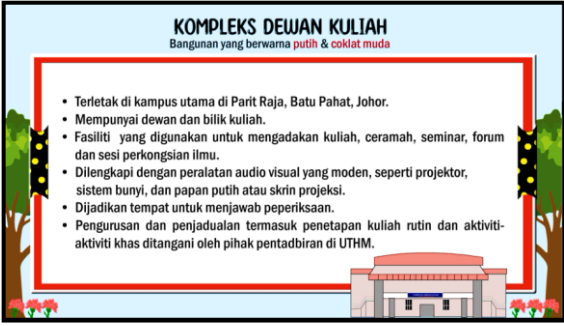
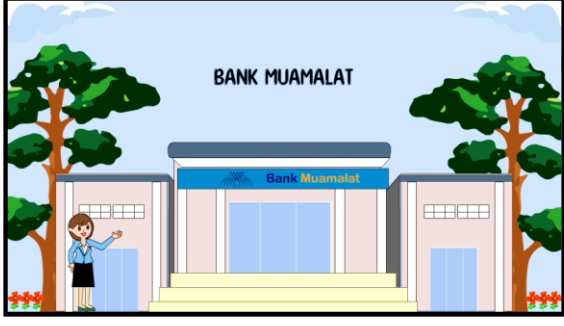


Continue Table 1

 <p>PEJABAT HAL EHWAL PELAJAR Bangunan yang berwarna putih & kelabu</p> <ul style="list-style-type: none"> • Terletak di kampus utama di Parit Raja, Batu Pahat, Johor • Terdapat tiga bahagian, iaitu Bahagian Pentadbiran dan Kewangan (BK), Bahagian Kebijakan dan Kesejahteraan Pelajar (BKKP), Bahagian Kepimpinan Dan Aktivi Pelajar (BKAP), Bahagian Penajaan dan Pengurusan Sistem (BPPS) & Bahagian Pengangkutan Pelajar (BPP). • Bahagian Pentadbiran dan Kewangan (BK) terbahagi kepada 3 unit iaitu Unit Pentadbiran, Unit Kewangan dan Unit Asat. • Bahagian Kebijakan dan Kesejahteraan Pelajar (BKKP) terbahagi kepada dua unit iaitu Unit Penajaan dan Unit Kebijakan dan OKU. • Bahagian Kepimpinan Dan Aktivi Pelajar (BKAP) mempunyai Unit Kepimpinan dan Aktivi. • Bahagian Penajaan dan Pengurusan Sistem (BPPS) terbahagi kepada dua unit, iaitu Unit Penajaan dan Unit Pengurusan Sistem. • Bahagian Pengangkutan Pelajar (BPP) terbahagi kepada dua unit iaitu Unit Pengangkutan Kontrak dan Unit Pengangkutan Universiti. 	<p>The screen page for the information of “Pejabat Hal Ehwal Pelajar” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
 <p>PUSAT KESIHATAN UNIVERSITI</p>	<p>The screen page for “Pusat Kesihatan Universiti” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
 <p>PUSAT KESIHATAN UNIVERSITI Bangunan yang berwarna coklat & kuning air</p> <ul style="list-style-type: none"> • Terletak di kampus utama di Parit Raja, Batu Pahat, Johor. • Dianggotai seramai 57 orang staf. • Dipimpin oleh pengarah dan beberapa bahagian termasuk Bahagian Pentadbiran dan Kewangan, Bahagian Perkhidmatan Perubatan, Bahagian Pergigian, Bahagian Farmasi, Bahagian Makmal Perubatan, Bahagian Kesihatan Persekitaran, Bahagian Fisioterapi, dan Bahagian X-Ray. • Terdapat beberapa perkhidmatan yang ditawarkan disini seperti Rawatan Pesakit Luar, Pergigian, Kecemasan, Pembedahan kecil, Fisioterapi, dan X-ray. 	<p>The screen page for the information of “Pusat Kesihatan Universiti” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
 <p>MASJID DAN PUSAT ISLAM</p>	<p>The screen page for “Masjid dan Pusat Islam” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
<p>Continue Table 1</p>	
 <p>MASJID DAN PUSAT ISLAM Bangunan yang berwarna putih & biru muda</p> <ul style="list-style-type: none"> • Terletak di kampus utama di Parit Raja, Batu Pahat, Johor. • Bangunan Masjid dan Kompleks Pusat Islam mengandungi Masjid, Pejabat pentadbiran, bilik seminar Al-Farabi, bilik komputer Al-Khawarizmi, bilik sumber Harun Al-Rasyid (kini Pejabat Institut Ahli Sunnah Wal Jamaah) dan lain-lain bangunan sokongan. 	<p>The screen page for the information of “Masjid dan Pusat Islam” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>

	<p>The screen page for Stadium shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of Stadium shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for “Pusat Pengajian Umum dan Kokurikulum” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of “Pusat Pengajian Umum dan Kokurikulum” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
<p>Continue Table 1</p>	
	<p>The screen page for “Pejabat Bendahari” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background Audio – Background music “Good Vibes”.</p>

 <p>PEJABAT BENDAHARI Bangunan yang berwarna putih & kelabu</p> <ul style="list-style-type: none"> • Terletak di kampus utama di Parit Raja, Batu Pahat, Johor. • Mempunyai empat bahagian, iaitu bahagian pentadbiran dan hasil, bahagian pembayaran, bahagian perolehan dan aset & bahagian akaun dan bajet. • Pelanggan terdiri daripada pelajar, staf, pembekal & pelawat. 	<p>The screen page for the information of “Pejabat Bendahari” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
 <p>DEWAN PEPERIKSAAN (F2)</p>	<p>The screen page for “Dewan Peperiksaan (F2)” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
 <p>DEWAN PEPERIKSAAN (F2) Bangunan yang berwarna kelabu, coklat & oren</p> <ul style="list-style-type: none"> • Terletak di kampus utama di Parit Raja, Batu Pahat, Johor. • Terbahagi kepada aras atas dan aras bawah. • Bertanggungjawab untuk mengendalikan urusan berkaitan dengan peperiksaan. • Berperanan dalam penyediaan jadual peperiksaan, dan pengawasan pelaksanaan peperiksaan. • Terdiri daripada anggota-anggota pentadbiran akademik yang dilantik oleh pihak universiti. 	<p>The screen page for the information of “Dewan Peperiksaan (F2)” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
 <p>PEJABAT PENDAFTAR</p>	<p>The screen page for “Pejabat Pendaftar” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
 <p>PEJABAT PENDAFTAR Bangunan yang berwarna putih, kelabu & kuning</p> <ul style="list-style-type: none"> • Merupakan tunjang utama pentadbiran UTHM yang bertanggungjawab dalam Pengurusan dan Pembangunan Sumber Manusia serta Keselamatan universiti. • Bermatlamat untuk menyediakan pengurusan dan memberi perkhidmatan yang endah dan berkualiti berteraskan kepada ilmu untuk kemakmuran universiti. • Ia terdiri daripada beberapa Bahagian iaitu Bahagian Sumber Manusia, Bahagian Pengurusan Organisasi dan Kompetensi dan Bahagian Keselamatan. • Bahagian Sumber Manusia terbahagi kepada Unit Prancangan dan Pelantikan Staf, Unit Kenaikan Pangkat Staf, Unit Sarana, Prestasi dan Elaun, Unit Perkhidmatan, Cuti dan Persaraan, Unit Pengurusan Sistem Maklumat, Unit Kemudahan Pengajian Staf & Unit Kewangan. • Bahagian Pengurusan Organisasi dan Kompetensi terbahagi kepada Unit Pengurusan Rekod dan Arkib, Unit Pentadbiran dan Pemesyuaratan, Unit Kebajikan Staf, Unit Integriti dan Kualiti, Unit Latihan & Unit Pengembangan Kompetensi. • Bahagian Keselamatan pula terbahagi kepada Unit Pentadbiran, Unit Keselamatan dan Kesihatan Pekerjaan, Unit Keselamatan Pertindungan, Unit Lalulintas & Unit Tugas Khas. 	<p>The screen page for the information of “Pejabat Pendaftar” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>

Continue Table 1

	<p>The screen page for “Kompleks Dewan Kuliah” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of “Kompleks Dewan Kuliah” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for “Bank Muamalat” shows the use of text, graphics, animation, and audio. Text – Title name Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the information of “Bank Muamalat” shows the use of text, graphics, animation, and audio. Text – Title and explanation Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>
	<p>The screen page for the list of important buildings at UTHM shows the use of text, graphics, animation, and audio. Text – Title name and the list of buildings Graphic – Design of the UTHM background. Audio – Background music “Good Vibes”.</p>



4.0 Results and Discussion

Product testing and evaluation are very important to a developer because they can help measure product quality. Developers have used an expert checklist form to obtain confirmation of the reasons for the process of testing and evaluating 2D animation video for visitors at UTHM evolution.

4.1 Interface Expert Assessment Analysis

Interface expert evaluation is an evaluation conducted by an expert on the design of the interface about the multimedia elements found in the 2D animation video for visitors at UTHM that has been developed. The measured aspects of the developed product are in terms of content design and interface design. A total of four experts were selected in the process of testing and evaluation of 2D animation video for visitors at UTHM. The selected experts all consist of experienced lecturers in the field of creative multimedia. Table 2 display the detail of the experts.

Table 2 Demographic for Four Experts

Detail	Expert 1	Expert 2	Expert 3	Expert 4
Gender	Male	Female	Male	Female
Educational Level	Degree	PhD	Degree	Degree
Working Period	>15 Years	>15 Years	< 5 Years	10 – 15 Years
Field of Specialization	Information Technology and Multimedia	Information Technology and Networking	Safety Department	Safety Department
Position	Engineering Lecturer	Prof Madya	Safety Officer	Assistant of Safety Officer

Meanwhile for the acceptance of product designs, 30 items have been prepared for the expert. Table 3 shows the frequency analysis and percentage of expert acceptance of product interface design.

Table 3 Frequency Analysis and Percentage of Expert Acceptance of Product Interface Design

No	Item	Frequency		Percentage of Acceptance (%)
		Yes	No	
Text				
1.	The text size used is appropriate.	2	0	100%
2.	Size of the text is consistent.	2	0	100%
3.	The position of the text is consistent.	2	0	100%
4.	Use of easy-to-read text.	2	0	100%
5.	The color of the text is appropriate.	2	0	100%
6.	Type of text that is easy to understand	0	2	50%
Graphic				
7.	The graphics used are compatible.	2	0	100%
8.	The 2D graphics used are compatible.			100%
	i. Introduction			
	ii.Virtual Tour around UTHM	2	0	
	iii. List of important buildings in UTHM			
9.	The size of the building graphics used corresponds with the background.	2	0	100%
10.	The 2D graphic design is the same as the existing building	2	0	100%
11.	The used graphics have a good resolution	2	0	100%
Audio				
12.	The use of the voice narator is consistent with the content.	2	0	100%
13.	The audio used is clear.	2	0	100%
14.	The voice of the narrator can be heard clearly	2	0	100%
15.	The voice of the narrator is appropriate.	2	0	100%
16.	The background music used is suitable	2	0	100%
Animation				
17.	The 2D animation is interesting.	2	0	100%
18.	The 2D animation produced is clear	2	0	100%
19.	The 2D animation produced is compatible	2	0	100%
20.	The 2D animation of the characters produced is interesting	2	0	100%
21.	The use of animation sizes is suitable	2	0	100%
Video				
22.	The animated design is interesting.	2	0	100%
23.	Setting up information that is easy to understand	2	0	100%
24.	The layout for the animated video show is interesting	2	0	100%
25.	Video attracted attention.	2	0	100%
26.	The duration of the video is appropriate.	2	0	100%
27.	The quality of 2D animated video is good	2	0	100%
28.	The animated video is clear.	2	0	100%
Interaction Design		2		
29.	Video animation can be controlled using the play/pause button	2	0	100%
30.	QR code can be connected to YouTube well	2	0	100%

The interface and multimedia element design section focuses on displaying 2D animated video interfaces in terms of layout, color, typography, shape, size, link and multimedia elements used by developers in the development of 2D video animation. For interaction design, QR codes for 2D animated videos have the right links to connect users to YouTube media as well as create a good interaction between users with the 2D Visitor Animated Video on UTHM that has been developed. Thus, the analysis of the design of the interface and multimedia elements is carried out against two experts in order to assess the compatibility of interface design and the multimedia elements applied.

There are 30 items that have been built on the interface design section and multimedia elements in the expert checklist form and all of those items are to identify whether the interface structure present in the 2D animated video is appropriate or not. It is divided into several sections such as text, graphics, audio, animation, overall 2D animated video and interaction design. Expert analysis of interface design and multimedia elements is like Table 3 and all such data is presented in the form of feedback notes.

Based on the results of the assessments obtained, all experts agreed that the text sizes used in 2D animated videos were appropriate. All experts also agree that the text size, and the text position used, is consistent. In addition, both experts agree that the use of text in 2D animated video is easy to read. The two experts also agreed that the use of text colors in 2D animated videos is compatible. However, both experts argue that the type of text used in animated videos is less of a type. The first experts stated that the type of text used on the "List of Important Buildings in UTHM" section was less appropriate. Meanwhile, the second expert stated that the type of text used on the main menu headers is less appropriate.

In addition, all experts also agree that the layout of the graphics used is compatible. They also agreed that the 2D graphics used on the section, "Identification", "Major Treatment Around UTHM", and "List of Important Buildings at Uthm" are compatible. Next, the two experts also agreed that the building graphics size with the background used is compatible as well as the 2D graphic design is the same as the existing building. For the eleventh item, both experts also agree that the use of graphics has a good resolution in 2D animated video.

For the audio element, two experts acknowledge that the use of the voice narator is consistent with the content of the 2D animated video. Two experts also agreed that the audio used was clear and the use of the narrator's voice could be heard clearly. Furthermore, both experts also argued that the intonation of the narrator's voice and the background music used was suitable for the 2D animated video that had been developed. In terms of the animation element, both experts are convinced that the 2D animation produced by the developers is clear and interesting as well as relevant. Two experts also agree that the 2D animation of the characters produced is interesting and the use of animation sizes is also appropriate.

For the overall part of the 2D animated video, both experts consider that the animation design developed is interesting as well as the arrangement of the information is easy to understand. Next, the statement "Design for animated video shows is interesting" was also agreed by the two experts. Both experts also agree that the provided 2D animated videos can attract the user's attention and have an appropriate duration. Furthermore, for the twenty-seven and twenty-eight items, all experts argue that the quality of the 2D animated video is good, and the animated videos produced are clear. From the context of interaction design, the two selected experts agreed that the animated video developed could be controlled using the play/pause button. The two experts also agreed that the QR code for 2D animated videos can be connected to YouTube media well.

4.2 Content Expert Assessment Analysis

Content expert evaluation is an evaluation performed by an expert on the content contained in 2D animation video for visitors at UTHM that has been developed. There were 15 questions items that had been prepared for the expert. Table 4 shows the frequency analysis and percentage of expert acceptance of product content design.

Table 4 Frequency Analysis and Percentage of Expert Acceptance of Product Content Design

No	Item	Frequency		Percentage of Acceptance (%)
		Yes	No	
1.	Is this 2D animated video content easy to understand?	2	0	100%
2.	Is the information shown relevant to the purpose of this 2D animated video?	2	0	100%
3.	Is the content displayed matching the target group?	2	0	100%
4.	Does the content of this 2D animated video explain clear	2	0	100%

information?

5.	Does the content of this 2D animated video explain the exact information?	2	0	100%
6.	Is the text used for the content compatible?	2	0	100%
7.	Is the voice of the narrator used for the content compatible?	2	0	100%
8.	Is the background music used for the content compatible?	2	0	100%
9.	Are the graphics used for the content compatible?	2	0	100%
10	Are the animations used for content compatible?	2	0	100%
11	Can this 2D animated video help visitors explore UTHM?	2	0	100%
12	Does this 2D animated video have a clear process flow?	2	0	100%
13	Can this 2D animated video attract the interest of the target group?	2	0	100%
14	Are the languages used in 2D animated videos suitable as delivery languages?	2	0	100%
15	Is the level of content delivery consistent with the capability of the target group?	2	0	100%

The content design analysis part is to discuss whether the 2D animated video content developed meets and meets the needs of users during a visit to UTHM. There are 15 items built on Part B to test the functionality of 2D animated video products that cover aspects of content design. The obtained data is analyzed and presented with frequency values and feedback records as in Table 4.

Based on the findings of the evaluations that have been carried out, all content experts agree that 2D animated video content is easy to understand. All experts also agree that the information shown is relevant to the purpose of 2D animated video. In addition, both selected experts argue that the content displayed is suitable for the target group as well as describing clear and accurate information. Next, the two experts agreed that the text, voice of the narrator, background music, graphics and animations used for the content content were appropriate. For the eleventh item, all experts also assume that 2D animated videos can help visitors explore UTHM.

In addition, both experts argue that 2D animated video has a clear flow of process and can attract the interest of the target group. For the fourteenth item, the two experts agreed that the language used in the 2D animated video is suitable as the delivery language. However, one expert suggested adding bilinguality to 2D animated videos to make it easier for overseas users to understand. Finally, all the selected experts agreed that the level of content delivery is consistent with the capability of reception by the target group.

Conclusion

In summary, this 2D animation video for visitors at UTHM has been well developed and successful with reference to the model used, namely the waterfall model. The phases found in this waterfall model have helped developers produce quality products and develop them in a timely manner. In product development, there are several things that need to be emphasized, namely the objectives of the study, the scope, and the research questions. The developers develop this product with reference to these three things so that it can achieve the stated objectives. Therefore, hopefully, this 2D animation video for visitors at UTHM can be used as a medium by users to obtain knowledge about all the important buildings that exist in UTHM as well as information related to the building more clearly without reference to maps.

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