MULTIMEDIA SYSTEM ON-THE-GO

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DECLARATION

I hereby declare that this project report entitled

MULTIMEDIA SYSTEM ON-THE-GO

is written by me and is my own effort and that no part has been plagiarized
without citations.

STUDENT : FS₁₇   Date : 16/8/2017

(MUHAMMAD FARIS FILDZA BIN CHE MOHAMMAD IDZA)

I hereby declare that I have read this project report and found

this project report is sufficient in term of the scope and quality for the award of

Bachelor of Computer Science (Media Interactive) With Honours.

SUPERVISOR :   Date : 26/8/17

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ABSTRACT

This project is about the development of learning management system using gamification approach for Multimedia System subject in FTMK UTeM. The main problem occured in current learning management system especially ULearn UTeM is that the environment of the design interface is formal. Students are easily bored with the system as there is nothing to be done constantly apart from retrieving lectures and assignments. The purpose of this project is to overcome the limitness of interactivity in learning management system by using gamification approach. The target group involved is students in FTMK. An existing system has been made on the internet, namely Matrix LMS. Matrix LMS consists of providing online training for students through the existent of leaderboards, points, scores and badges. The difference for this new project is that it will focus on one subject which is Multimedia System subject and design of graphic elements compared to Matrix LMS. The methodology that will be used in this project is System Development Life Cycle (SDLC) which consists of software develompent phases, namely planning, analysis, design, implementation and testing. One of the objectives for this project is to study the gamification elements needed for the learning management system. Another objectives are to create a learning management system using the gamification elements and to validate the usability of the created learning management system with gamification elements. Lastly, the expected output from this project is that there will be an increase number of students visiting the e-Learning content periodically. The testing conducted is the usability testing. The testing participants are 20 respondents of FTMK students. With the testing conducted, it shows that this system is a moderate success but getting a positive response from testers regarding one of the gamification elements, points. Thus, this will be a step-up for learning content developers to upgrade the learning content experience using gamification.

ABSTRAK

Projek ini adalah tentang pembangunan sistem pengurusan pembelajaran Sistem Multimedia dengan menggunakan pendekatan 'gamification'. Antara masalah yang dihadapi dalam sistem pengurusan pembelajaran yang terkini adalah rekabentuk antaramuka yang formal. Para pelajar terlalu cepat menjadi bosan dengan sistem terkini disebabkan bilangan aktiviti yang terhad selain daripada mengambil bahan nota dan tugasan. Tujuan projek ini dibina adalah untuk mengatasi had interaktif di dalam sistem pengurusan pembelajaran dengan menggunakan pendekatan 'gamification'. Projek ini difokuskan untuk para pelajar di FTMK. Sistem yang menggunakan pendekatan yang sama telah dibangunkan sebelum ini yang dinamakan Matrix LMS. Perbezaannya dengan sistem yang akan dibangunkan adalah sistem ini akan difokuskan untuk subjek Sistem Multimedia sahaja. Metodologi yang digunakan adalah Kitaran Hidup Pembangunan Sistem (SDLC). SDLC mengandungi lima fasa iaitu Pelan, Analisa, Rekabentuk, Pembangunan dan Pengujian. Objektif dalam pembangunan sistem pengurusan pembelajaran ini adalah mengkaji elemen 'gamification' yang diperlukan untuk sistem pengurusan pembelajaran Sistem Multimedia. Objektif seterusnya adalah membina sistem pengurusan pembelajaran Sistem Multimedia berdasarkan elemen 'gamification' dan mengenal pasti kebolehgunaan sistem pengurusan pembelajaran Sistem Multimedia ini. Jangkaan hasil daripada projek ini adalah ramai pelajar akan lebih kerap menggunakan sistem ini. Pengujian terhadap sistem ini telah dilakukan terhadap 20 orang pelajar FTMK dalam bentuk pengujian kebolehgunaan. Berdasarkan pengujian yang telah dibuat, sistem ini dikira sebagai suatu kejayaan yang sederhana. Akan tetapi, terdapat respon yang positif dari para penguji di mana salah satu elemen 'gamification' iaitu 'points' dikira berguna dalam sistem ini. Oleh itu, 'gamification' boleh memberi sedikit suntikan kepada pembangun sistem pengurusan pembelajaran untuk memperhebat sistem mereka yang terkini kepada sistem yang menggunakan 'gamification'.
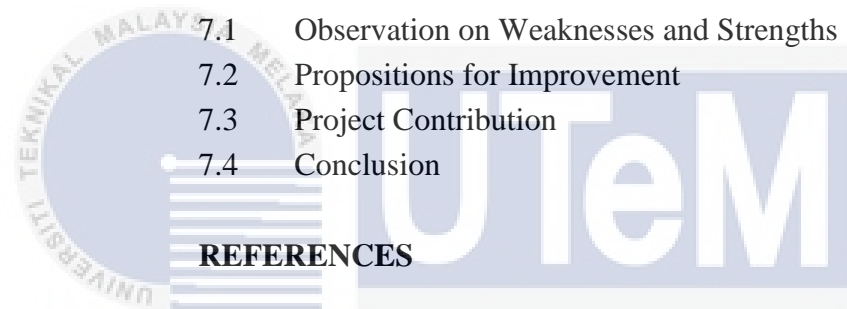
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CHAPTER I

INTRODUCTION

1.1 Introduction

Universiti Teknikal Malaysia Melaka is the first technical University in Malaysia. In its education system, especially in Faculty of Information and Communication Technology (FTMK), it uses online learning management system called Ulearn. Students and staffs get the education resources through this system. There is no need of traditional way of handing the resources. This is because students can submit their assignments in the system from everywhere, as long as they have internet connection.

This project is intended to build the learning management system for Multimedia System subject but using a different approach of gamification. The reason gamification is used is that students nowadays happily spend more time playing games. Thus, rather than to prevent them from playing games too often, the game elements will be used in the learning management system. This is to ensure students enjoying the education content which is almost the same as them enjoying games.

1.2 Problem Statement

One of the problems currently faced by the existent of learning management system especially UTeM's Ulearn is that the interface design is somewhat monotone. This means that the display of elements are currently looked formal. This makes students bored and rarely accessed the system just to get lectures and assignments information. Thus, students usually pick up the knowledge in the last minute especially

before the mid term test and final examination. The system's design does not motivate students to be eager to get knowledge. Even though there are online quizzes, it is not enough because there is no overall performance progress that should motivate students when enrolling subjects throughout the semester.

1.3 Objective

The following are the objectives that identified in creating this project:

1. To study the gamification elements needed for the learning management system based on Multimedia System subject.

2. To develop a learning management system based on Multimedia System subject using gamification elements.

3. To validate the usability of gamification elements in created learning management system.

1.4 Scope

In this project, it focuses for the usage among the students of FTMK in UTeM. The reason for this target is that the system uses the material that is from FTMK itself which is the Multimedia System subject. The students in FTMK can be from any courses, be it Software Engineering, Database, Networking and even Media Interactive itself. This is because Multimedia System subject is a compulsory subject for all courses in FTMK. The staffs, i.e. the lecturer that teaches Multimedia System subject can also use this system to update the lecture materials. This learning management system is also focuses on one subject only. This is because of the limited time allocated for the system development. Usually one subject consist of more than ten chapters. Thus, the creation of each chapters in this learning management system is time consuming. The limit of chapters for this project is five chapters, Chapter 1 until Chapter 5. The chosen gamification elements to be used in this project are points, levels and leaderboards.

1.5 Project Significance

Through the creation of this project, a system is created in a new way which is different from the traditional system. It incorporates game elements but not necessarily the game into a formal system. Even so, one must not put any game elements

in a random manner. This is because it reflects the usability environment of the system. The motive of gamification is to make the formal education system enjoyable but at the same time beneficial to gain knowledge. Thus, the gamification elements are studied to cater the needs of gaining knowledge especially in Multimedia System subject. There will be a new type of system if this system that uses gamification elements is developed. This is because gamification is still considered new in education field. Even though the concept is considered new and not widely applied, the term is introduced years ago.

1.6 Conclusion

One of the expected results that can be gained through this project is that there will be an increase for the number of visitors towards the learning management system. This is because most people nowadays are attracted to game-alike content. Besides that, through the integration of gamification approach in the learning management system, visitors especially students can enjoy and immerse themselves in using the system. This makes them understand and easy to gain knowledge of the subject in the learning management system. With this development of learning management system for Multimedia System subject in FTMK UTeM, students can now easily empower the knowledge of integrating media elements into one system.

Based on this chapter, this project is about the creation of learning management system using gamification elements. The problem statement is identified so that the creation of this project addresses the problems occurred. The objectives are also stated to ensure the measurable outcome of this project. Scope limits the target audience that use this project and ensures the creation of this project is achievable and can be done in a limited time. Lastly, the project significance provides the benefits that can be gained through the creation of this project.

CHAPTER II

LITERATURE REVIEW AND METHODOLOGY

2.1 Introduction

Literature review is defined by referring to a group of substances that is collected and focused on a title. Even though the review can consist of any information, it does not necessarily provide the opinion from the reviewer whether the sources are acceptable or not. A shared information in a certain topic is discussed in literature review, where sometimes it also discussed within a particular interval. Literature review usually has organized pattern and consists of summary and synthesis of the sources. The recall of the high-priority information of the source is called summary, whereby the organized or paraphrased information of the source is called synthesis. The literature review can represent the old stuff in a new way or mixing the new and old representations of the stuff. At some point, the literature review could appraise the source and notify the reader relevantly.

Compared to academic research paper which functions as creating new argument and including the literature review itself, the literature review focuses on summarizing and synthesizing only which is not adding another new contribution. Literature review is suitable for short time research which act as stepping stone to do further research. It can be beneficial for professionals as a report that keeps updated on the current situation in a certain field. Scholars may identify the depth and breadth literature review as the emphasis of credibility for the writer in the certain field. In a research paper, literature review can provide strong background for the investigation. This shows that the knowledge of the literature in a certain field is important to research papers.

2.2 Domain

Learning management system is a technique of delivering educational content using electronic systems and internet. This is because people nowadays use internet to gain information and resources. The internet provides unlimited database of resources all over the world. These can be accessed as long as the person has an internet subscription. Thus, an act of movement has been made by academic experts to apply this electronic technology inside academics. This results the alternative for the old-school style of learning by using classroom. One of the benefits for learning management system is students can apply knowledge online without seeing the teacher face-to-face. The teacher can be anywhere, where he can upload lectures and assess students' progress. This proves that there will be no excuse for irregular attendance in school and students can get all of needed information in any time.

In the early of the 90s, surprisingly, there are some schools that started to hand out the education courses online (Epignosis LLC, 2014). This serves the purpose of internet, making people who couldn't attend academic institution finally getting their education. This kind of technology proves to help the startups of education that squeeze the costs of distance learning. This boosts students to easily hand out the education to a larger audience. Moreover, in the 2000's, learning management system is used in businesses to educate the workers. Both novice and veteran workers can now easily empower their skills and knowledge through this opportunity. For home users, they were given entrance to programs to enlarge their knowledge and to some extent, able to achieve online degrees.

2.2.1 Concept of Gamification

Gamification uses the concept of games for non-game systems. It does not necessarily need to be like a game, but just with the usage of game elements (Glover, 2013). For example, the integration of leaderboards that promotes competition among players through best scores and ranks. This can be applied in e-Learning content that motivates students to become competitive in terms of empowering the knowledge of certain subjects. Another example of usable game concept in non-game system is tracking of progress. This is done by checking whether the tasks have been fulfilled to reach the specific goal. In the context of academic, tracking of progress could summarise what students have achieved and possibly provide guidance and improvements to them. This will educate students to become punctual on making progress of gaining knowledge of certain subjects.

Pappas (2017) states that gamification includes 7 elements, leaderboards, badges or levels, points, collectibles, course currency, virtual raffle tickets and keys.

- **Leaderboards**: The most aggressive element in gamification. It encourages learners to overcome their opponents to get to the best position. It is best used to promote top learners to public audience for their efforts.
- **Points**: A mechanism that allows learners to earn something for involving in various activities provided.
- **Badges**: It is supposed to be more tangible achievement. When a learner involved in some activities until a certain goal, he will be given badges to appraise his effort.
- **Collectibles**: It allows learners to collect things as part of their own collection. They are also tradable by communicating with other learners to do a deal.
- **Course Currency**: It is a sort of virtual money that can be used only in the particular learning course. This allows learners to quickly unlock some features which by norm makes people need to have extra effort to unlock it.
- **Virtual Raffle Tickets**: A sort of lucky dram mechanism. It allows learners to win special prizes, usually upon ending the learning courses.
- **Keys**: Another alternative to unlock rewards or features in a learning content. In some occasions, multiple keys needed to be kept in order to unlock certain feature or rewards.

2.3 Existing System

Usage of gamification approach has proven to become a success in previous developments. One of the example systems is Matrix LMS by Cypher Learning. This system is targeted for any students from academic institutions or businesses by providing subscription based Learning Management System (LMS). The technology used is online e-Learning system by providing online training to students and corporates across the world. Notable components included in this system are the inclusion of leaderboards, points, badges and levels. However, this is a commercial system whereby the need of at least 50 students are required for the price of $120 a month.

Matrix LMS is ranked among the top 50 LMSs for 2017 (Weiss, 2017). It is recognised for its independent user interface, sizable feature set and powerful result of investment. Matrix provides concentrated surroundings for the creation of content, online coaching, assessment of learner's production, covering the needs of management that related to coaching and enlarging the income trough selling courses.
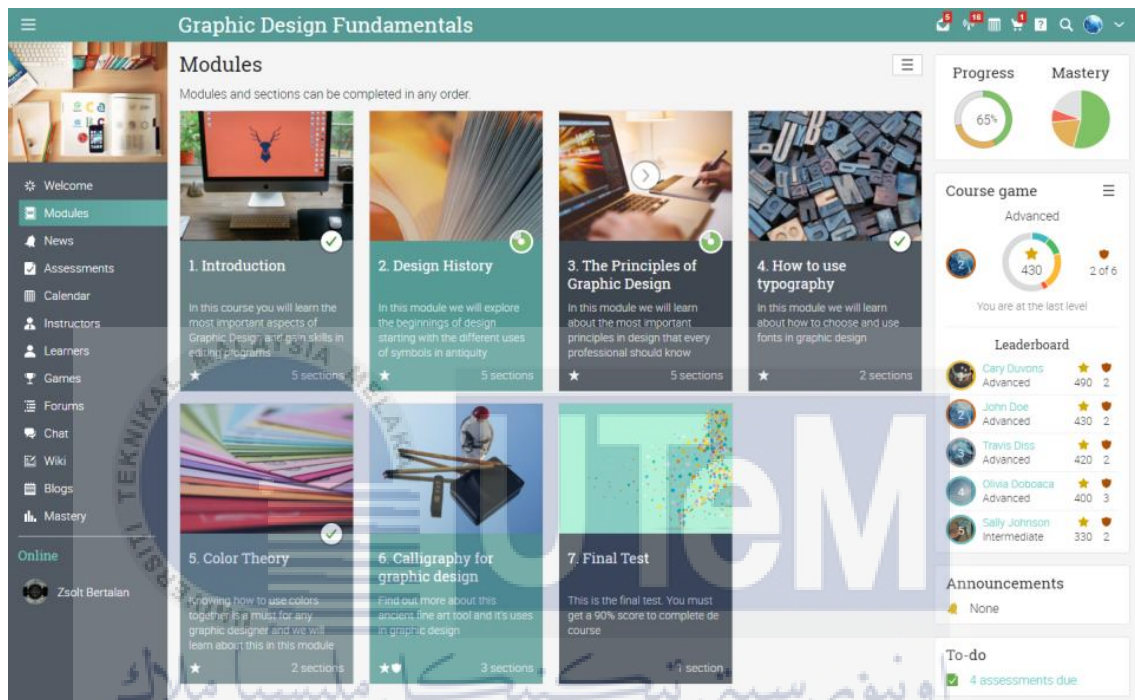

Figure 2.1: The Modules Section in Matrix LMS Interface
(Source: https://www.matrixlms.com/)

Another example of system that uses gamification is Duolingo. It focuses on learning second language from any language. It is now currently used by more than 70 million people around the world (Penfold, 2015). To portray the concept of gamification, the system is self-paced learning type. It is then followed by the accompany of daily goals to be achieved. To ensure the progression of learners throughout the course, the content is delivered into appropriate number of chunks followed by roadmaps to indicate the distance of progression. Another feature of Duolingo is the placement test which helps learners start the course based on their particular language skills. The game elements used in Duolingo are the points, leaderboards and currency rewards system. The hierarchy of levels is presented in a way of completing the first level, only which then the second level is unlocked. Furthermore, learners can share their translation among others and vote for the best translation to ensure the improving of language skills.
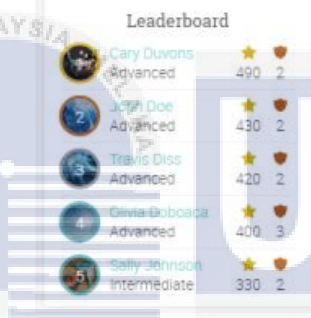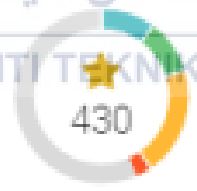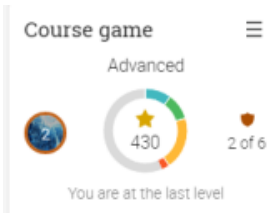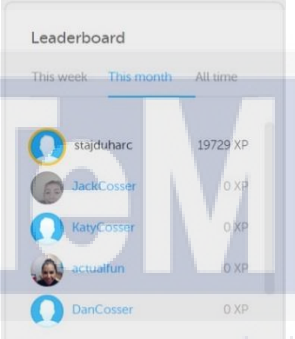
Figure 2.2: The Interface of Duolingo

(Source: https://www.duolingo.com/)
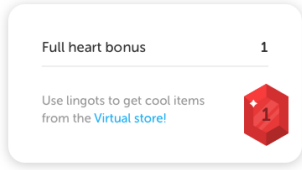
2.3.1 Comparison of Existing System

Table 2.1 shows the comparison of, Matrix LMS and Duolingo. From the two existing systems, the distinct and missing features can be identified. The proposed features will then be introduced on the new e-Learning system that is going to be known as Multimedia System On-The-Go. MS-OTG covers on Multimedia System Subject BITM 1113 for Undergraduate students at Faculty of ICT (FTMK), UTeM. This subject been chosen because it is a compulsory subject for every FTMK student. Thus, the need of a system for this subject is needed to help the learning process of the students.

Table 2.1: Comparison of Existing Systems and The Newly Proposed System

System comparison	Matrix LMS	Duolingo	Multimedia System On-The-Go (MS-OTG)
Content type	Any learning content	Second language content	Multimedia System Syllabus
Target	Students across the world	Everyone across the world	Students in FTMK
Learning type	Self-paced	Self-paced	Self-paced
Game elements	• Leaderboards • Points • Badges & Level	• Leaderboards • Points • Levels	• Leaderboards • Points • Levels • Assessment system (by lecturers)

| | | • Currency rewards

You've earned 1 lingot!

Full heart bonus   1

Use lingots to get cool items
from the Virtual store!   1 | |

2.4 Project Methodology

Software development methodology is a platform of how we presenting the process of developing a software. Different methodologies are presented in a way of substantiality and the explanation of each of its own principles (Sonmez, 2017). The application of methodology in software development is practical as it enhances the standards of software development. The determination of suitable methodology is considered on expectation which heads to ongoing arguments. It is also encouraged by patient participation, that makes the procedure to software development outcomes in less flaws. Thus, the software can be built in a short time and provides greater usefulness (Chapman, 2004).

The methodology that will be used in creating this project is System Development Life Cycle (SDLC). SDLC is a traditional mainstream methodology that consists of five phases. Firstly, the planning phase describes background, timeline, scope, budget and responsibility of the project. In this case of new proposed system, it will tell the background of e-Learning content for Multimedia System subject which uses gamification approach. The timeline is constructed in form of gantt chart. The scope for this new proposed system is mainly targeted for students of FTMK. No budget involved and since this is a one-man project, all responsibilities are handled by one person.

Secondly, the analysis phase explains about the requirements that need to be used in creating this project. The tool that will be used is web development software while the materials to be used are game-like graphic elements and lectures for Multimedia System subject. Thirdly, the design phase focuses on the creation of graphic elements and sketches in the system. In this e-Learning content, the design focuses on the navigation structure, storyboard that shows series of pages and the development of game-like graphic elements in terms of tracing.

Besides that, the implementation phase is the starting of development of this system. The development of content is done by coding and programming the modules, features and functions. Since this system is non-game system, the development is done by usual method which is software based but with game-like elements. Lastly is the testing phase. Testing is done whether the newly created system is following the requirements or producing lots of errors. The testing method that will be used in this new system is the Blackbox Testing.
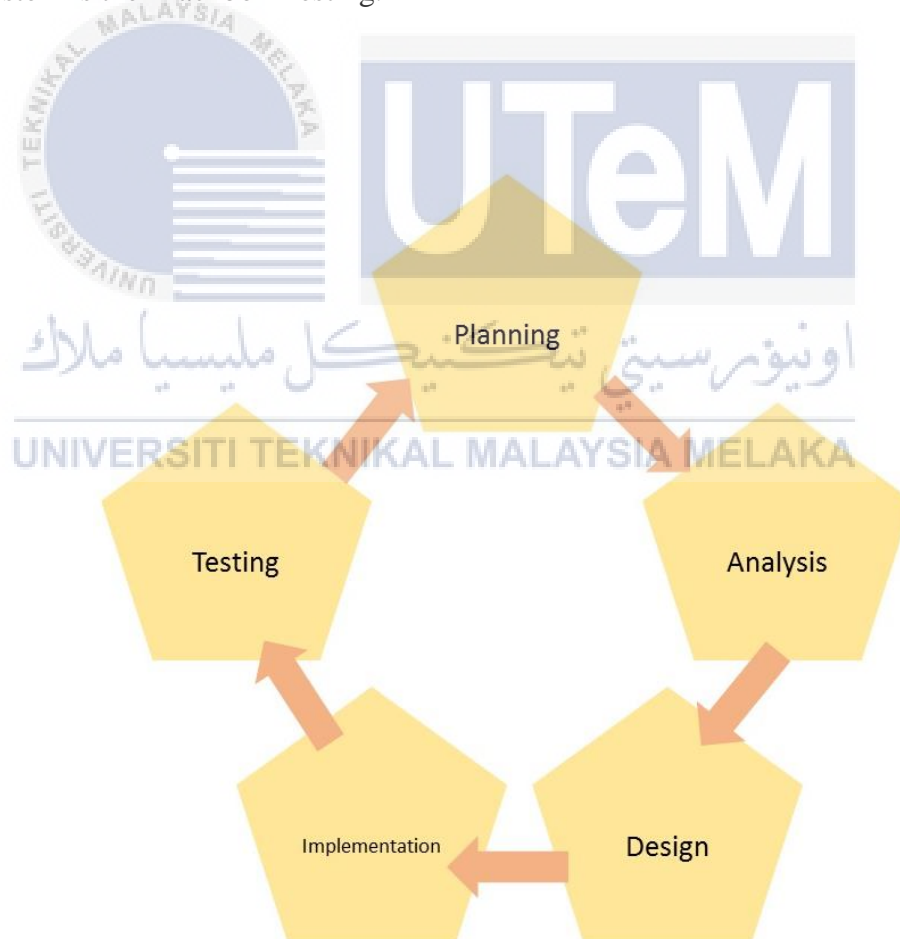

Figure 2.3: The Systems Development Life Cycle