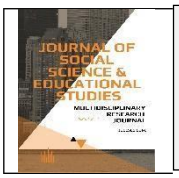

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The Requirement Scheme for Tarannum Smart Learning Application

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ABSTRACT

Tarannum is an art of beautifying and curving the voice tone according to a specific tempo and rhythm. It is a traditional art of reciting the Holy Quran. However, with the rapid advancement of ICT and high-end gadgets that have turned us into a digit society, there is an urgent need to create a new method of learning the tarannum. Therefore, the Tarannum Smart Learning Application (Tarannum-SLA) is proposed. It is an innovation of learning the tarannum, intending to catch the attention of new generations towards the Quran. This paper describes the process of requirement gathering and analysis for the development of Tarannum-SLA, referring to the initial phases in System Development Life Cycle (SDLC). The process of data collection, data analysis and preliminary design are discussed thoroughly in this paper. As a result, a requirement scheme is produced, which is ready for the next steps of Tarannum-SLA development.

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INTRODUCTION

Tarannum Smart Learning Application (Tarannum-SLA) is our proposed courseware that is intended for those interested in *tarannum* knowledge. It can be a useful reference and comprehensive guide in reciting various types of *tarannum*. The main aim of this courseware is to facilitate users to discover and learn the holy Quran. Additionally, it will be useful for users to spread the Quranic knowledge, especially in the aspect of *tarannum*. In this article, we present a set of requirements, which is ready for the next steps of Tarannum-SLA development.

Al-Quran and Multimedia

Multimedia is a woven combination of digitally manipulated various elements such as graphics, audio, text, animation and video (Gunawardhana & Palaniappan, 2016; Vaugan, 2011). It has the ability to change the assessment and establish how the person is thinking or learning (Manurung & Panggabean, 2019; Mayer, 2017). Abundance multimedia software has been developed nowadays. These software are being widely used to develop engaging and entertaining content (Adekunle, Olumide, & Olutayo, 2019). The teaching and learning of the Quran by using multimedia software is one of the proactive steps to attract the new generations to it (Zainuddin, Mat Saad, & Harun, 2018; Hamzah, Abd Halim, Hassan, & Ariffin, 2019). In addition, various techniques of reading the Quran can be learned through this multimedia software. The Quran is one of the prophecy signs of the Holy Prophet Muhammad S.A.W and is the most widely read book by humans. Amazingly, the verses of the Quran will never be bored to be read and heard, and they can be recited in a variety of rhythm tracks (Munir, 2005). Listeners will be calmed by the rhythms and melodies recited from the verses of the Quran. Thus, the technique to recite the Quran using multimedia is one of the enjoyable and effective ways because it combines various elements such as graphics, audio, animation and video (Hanafi, Murtadho, Ikhsan, Diyana, & Sultoni, 2019).

The art of recitation or *an-Nagham fi al-Quran* is the intonation exploitation of the Quran. It is a Quran recitation technique, known as a *tarannum*, which manipulates the variance of voice-based on certain notes and rhythms (Abdullah, 2004). In other words, it can be described as an art that seeks to soften the sound of voice while reciting the verses of the Quran. Sound vibrations coming out from the human voice box should be well controlled to achieve the beauty of reciting the Holy Quran (Harun, 2001). Nowadays, *tarannum* is practised in Malaysia through a *Qari* who specializes in this course (Soleh, 2002). Although *tarannum* is broadly practised in tertiary institutions, secondary schools and primary schools, there are limited attempts to make *tarannum* learning engaging. The *tarannum* has been exposed to the Malaysian community through a number of television shows such as *Akademi Al-Quran* and *Mari Bertarannum*. This popularity is in line with the awareness of Malaysians to learn *tarannum* and the Quran. Nevertheless, as the country is progressing forward, the main hindrance that deters Malaysian from learning the Quran is busyness. Hence, it is hoped that the development of Tarannum-SLA will benefit the community by making the learning of *tarannum* easy and fun.

METHODOLOGY

Multimedia content allows users to interact with the respective software. Similarly, users are provided with the ability to control what, when and how the content will be presented (Rajendra & Sudana, 2018; Harun, 2001; Harun & Tasir, 2001). The capability of users to control what and when the element should be delivered is called interactive multimedia (Vaugan, 2011). This feature allows users to freely access the information without order. Access is usually done using certain keys associated with the display that have relationships between key names. Interactivity can be implemented in several ways, including by using hypertext and hypermedia. Furthermore, the interactivity gives users several privileges including; (i) response to user activity, (ii) access to information randomly as required, (iii) flexibility between humans and application, (iv) option to order, and (v) two-ways communication between the computer and human (Oh, Bellur, & Sundar, 2018; Borsook & Higginbotham-Wheat, 1992). Most multimedia projects are undertaken in stages. Prior stages should be completed before it can proceed to other stages. Table 1 elaborates on the stages that were followed by our project.

Table 1: The Stages of the Tarannum-SLA Project

No	Stage	Description

1.	Planning and Costing	This stage begins by generating ideas on the requirements and refining the project objectives. Before the development can be initiated, it is carefully planned especially in the aspects of required writing skills, graphics art, music, video, and other multimedia expertise. Finally, this stage is completed with a draft of a low-fidelity concept; a simple, working example to demonstrate whether the idea is doable.
2.	Designing and Producing	This is the stage where the development team performed each of the planned tasks to create a finished product. During this stage, there may be many feedback cycles with prospect users until they are satisfied.
3.	Testing	During the testing stage, the application is tested to make sure that it meets the project objectives, as well as works properly on the intended delivery platforms and meets the needs of users.
4.	Delivering	This is the final stage in which the application is delivered to the particular end-users or clients. Over time, the project team is prepared to follow up with tweaks, repairs and upgrades.

Meanwhile, the System Development Life Cycle (SDLC) is the process of creating or altering systems (Ragunath, Velmourougan, Davachelvan, Kayalvizhi, & Ravimohan, 2010) that is used as a guide to developing Tarannum-SLA. The process model and life cycle model are two terms that are used interchangeably, although some might view the process from the perspective of improvement. The SDLC represents a generic model for software development and consists of several stages. These stages are; (i) requirement capture, (ii) design, (iii) build, (iv) test, and (v) implement. All software, system or application development follows this generic model in one way or another. The requirement stage captures all activities that are performed to elicit the user requirements and the documents that are produced during this stage. The design stage represents the layout of the software based on the requirements. The build stage involves the coding/development of the software system. Next, the test stage entails the process of evaluating the code and the implement stage is the eventual installation/acceptance of the software system in its targeted environment (Li, Liu, & He, 2001). Additionally, in practice, there is often some overlap and iteration between these stages, as described in Figure 1.

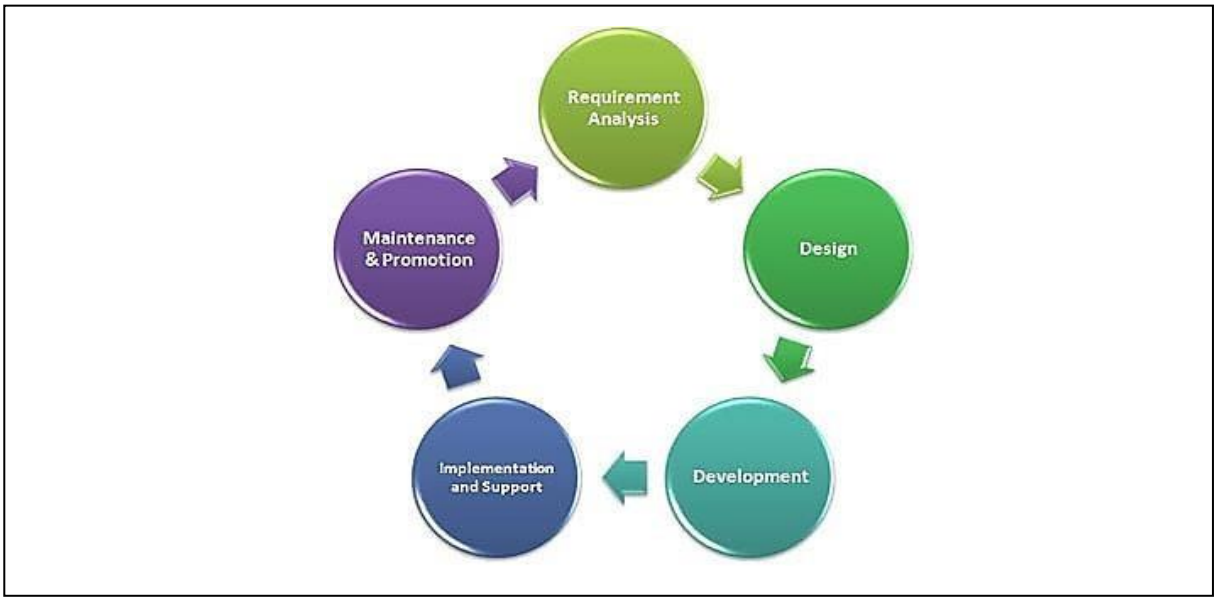

Figure 1: Software Development Life Cycle

This lifecycle is used to represent a model that captures a set of activities and how they are related. Sophisticated models also incorporate a description of when and how to move from one activity to the next and a description of the deliverables for each activity (Ragunath et al., 2010). The reason such models are popular is that they allow developers and particular managers to get an overall view of the development efforts so that progress can

be tracked, deliverables specified, resources allocated, the target set and so on. In sum, any lifecycle model is a simplified version of its reality.

REQUIREMENT ANALYSES

The requirement gathering and analyses are vital in this project. The important information including software and hardware needed to develop the courseware are compiled (Iqbal & Idrees, 2017). The development team has to take note of all the requirements needed and make sure that this courseware can be developed effectively and efficiently. The following sub-sections describe the data collection and analysis, followed by the elaboration of all requirements of software and hardware to support the development of the Tarannum-SLA.

Data Collection

This section explains in detail the methods and techniques applied by us in carrying out this project. There are various methods used to gain facts and information. We used several steps and methods to systematically complete this project. The first and foremost step was data collection. Data is any information that can be taken from any source such as books, previous research, scientific papers, documentation, or other printed materials. To facilitate the data collection, we used the methods illustrated in Table 2.

Table 2: The Methods of Data Collection

No	Method	Description
1.	Document Review	The documents relevant to the objectives and scope of the project are collected. The document refers to written or electronic materials giving some kinds of information and explanation. Among the documents required for Tarannum-SLA application are the manuscripts of the art of Quranic recitation, prior research and projects, as well as related books.
2.	Interviews	Using this method, we conducted a series of interviews with several *qaris*. Through face-to-face interviews, developers have recorded every single recitation by *qaris.* The information about styles and rhythms of recitation, including *Bayyati*, *Nahwand*, *Hijjaz*, *Soba*, *Rast*, *Sikah*, and *Jiharkah* are necessary for the project.
3.	Discussion with Experts	Discussion with a *tarannum* expert is made from time to time to ensure that the information obtained meets the needs of the project. Things that are not understood and the problems encountered are explained by the expert through the discussion.

Data Analysis

Later, the information gathered is analyzed by using the following methodologies, as described in Table 3.

Table 3: The Data Analysis Methods

No	Method	Description
1.	Induction	The induction method is used to draw a conclusion from specific evidence and to come out with a consensus. In this study, this analysis method is used starting from the process of analyzing a title up to the completion of the project.
2.	Deduction	The deduction method draws a conclusion from general evidence to come out with a specific consensus. The application of this method puts forward a

		statement and gives evidence which can be used as a guideline for the problem being studied.
3.	Comparative	This is a technique to conclude by comparing all the obtained facts. The developers compare collected data to make an overall judgement. This method is used in this project in comparing every explanation such as the introduction of recitation, rules of recitation, and features of Quranic recitation which are *Bayyati*, *Nahwand*, *Hijjaz*, *Soba*, *Rast*, *Sikah*, and *Jiharkah* to be included in the project.

Hardware Requirements

Hardware refers to physical pieces of a computer. This could be a hard drive, monitor, memory chip, or central processing unit (CPU). After some technical feasibility analysis, it is found that the minimum hardware requirement for the Tarannum-SLA is; (i) Random Access Memory (RAM) 2 GB, (ii) Operating System (Windows, Macintosh, Linux), (iii) Processor (Intel, AMD), (iv) Hard disk (HD) 2 GB, (v) Digital Single Lens Reflect (DSLR), and (vi) Earphone and microphone.

Software Requirements

Opposite to hardware, software refers to something intangible. Software, sometimes known as a program or application is a program that tells the computer system what to do (Williams-Young et al., 2019). Software is necessary to operate the hardware. In this project, we used a number of software throughout the development process, as stated in Table 4.

Table 4: The Software for the Development of Tarannum-SLA

Type of software	Description
Image Editor	We used Adobe Photoshop software to deliver more imaging enhancement. It is used together with the Adobe Mercury Graphics Engine for blazingly fast performance. Interestingly, it allows greater precision, and intuitively creates 3D graphics, 2D designs, and movies using new or reimagined tools and workflows.
Animation Editor	We used Adobe Flash Professional software which is a powerful authoring environment for creating animation and multimedia content. For Tarannum-SLA development, we also used this software to design immersive interactive experiences that present consistently across desktops and multiple devices, including tablets, smartphones, and televisions.
Audio Editor	We used Adobe Soundbooth which is a digital audio editor by Adobe Systems Incorporated for Windows XP, Windows Vista, 7 and Mac OS X.

DESIGN PROCESS

Adobe Flash provides internal and external scripting capability and is based on a scripting engine that is “rock solid” in comparison with other multimedia authoring applications. The language is maturing rapidly and is beginning to compete with many integrated development environments (IDEs) and programming languages in terms of functionality. Scripting in Adobe Flash is not just solely for multimedia anymore. Rather, it is nearing the level of true application programming language (APL). To develop Tarannum-SLA, we prefer to use script 3.0 as the scripting language when using the Flash CS5 application.

Project Sketching and Storyboard

Before starting the process of developing the interactive software, we created and completed the storyboard to guide the project's flow. A storyboard is a visual representation of developers' vision of what the final product should look like (Murauer, 2018). It typically consists of a series of hand-drawn cells in the size of a half-sheet of paper or an index card, which represent the initial vision of what the future project would appear. The connectivity of the storyboards is represented in a one-page diagram, which connects each of the individual storyboards together. The purpose of the storyboard is to determine a logical format for the information to be presented in the multimedia project (Rim & Shin, 2020). This means that the designer will make critical decisions during the storyboarding process, including how information is to be grouped and how specific information is to be represented. Furthermore, navigational decisions were also made based on the organization of the information. For this Tarannum-SLA courseware, the storyboard includes the title, number of pages, frame name and the description of everything on the screen.

CONCLUSION

The Tarannum-SLA is the courseware that is very suitable for millennial society, especially for those who are interested in the t*arannum* field. It will guide and give information about *tarannum* in engaging and interactive ways. This courseware is user-friendly and introduces *tarannum* using the *harakat* method. The *tarannum* is the rhythm, tune or style of the Quran recitation, consisting of seven types of styles. It is an art of beautifying and curving according to the tone of voice, a certain tempo and rhythm. The purpose of this art is to give voice to the *qari* while appreciating the Quran. In addition, it instils an understanding of the beauty and magnificence of God and His Words. The Holy Quran should be understood beyond the mind, heart and spirit. In conclusion, this article presents the process and requirements of Tarannum-SLA, which is further being used to develop a working prototype. It is hoped this project will contribute to society by creating an innovative method to learn the *tarannum.*

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