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INTERACTIVE OF QUICK RESPONSE (QR) TECHNOLOGY IN LEARNING SESSION

HIEW POH LING

A REPORT IN FULFILMENT OF THE REQUIREMENT FOR THE AWARDS OF THE DEGREE OF BACHELOR OF COMPUTER SCIENCE (SOFTWARE ENGINEERING) WITH HONOURS

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ABSTRACT

Here is the briefly discussion about web based learning system using Quick Response (QR) Technology in Learning Session. With the technology will let students have opportunity interactive with QR technology in the early stage. The aim of the proposed system is to bring alternative ways for kindergarten student to learn in an easy and attractive method during their kindergarten time so that they have interest to learn and engage students actively participate with it. They can have self-learning during at home by using smartphone to scan the QR codes which can automatically link to the shortened Uniform Resource Locator (URL) generator. Besides that, when students have problem with the assessment question, they can get answer through scan the QR codes and learn from there by itself.

ABSTRAK

Berikut adalah perbincangan ringkas mengenai sistem pembelajaran berasaskan web menggunakan Respons Pantas (QR) Teknologi dalam Sesi Pembelajaran. Dengan teknologi, pelajar mempunyai peluang interaktif dengan teknologi QR di peringkat awal. Tujuan sistem yang dicadangkan adalah untuk membawa cara-cara alternatif untuk pelajar tadika belajar dalam kaedah mudah dan menarik. Mereka boleh mempunyai pembelajaran sendiri semasa di rumah dengan menggunakan telefon pintar untuk mengimbas kod QR yang secara automatik boleh menyambung kepada Uniform Resource Locator (URL) penjana dipendekkan. Selain itu, apabila pelajar mempunyai masalah dengan soalan penilaian, mereka boleh mendapatkan jawapan melalui mengimbas kod QR dan belajar sendirinya.

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LIST OF ABBREVIATIONS

QR : Quick Response

URL : Uniform Resource Locator

DFD : Data Flow Diagram

ILS : Integrated Library System

GUI : Graphical User Interface

RAP : Rapid Application Development

CHAPTER 1

1. INTRODUCTION

This chapter is about the general description about the project that will be developed. The section consists of problem statement, objectives, scopes, review previous work, current system and limitation, methodology and report organization.

1.1 PROBLEM STATEMENT

Nowadays, technology has been improving and become part of our life. We are in the steps toward the modernizing education and making it technology aided. Combination of technology and education are useful with right reason and vision. 21st Century Education is incorporated with technology like computer and smartphone which will bring much more enjoyable, interesting and easy way to learn as compared to traditional classroom education system. With technology, teachers and students have a variety of learning tools at their fingertips.

Seem modernizing education is around of us but QR codes technology in education are still unfamiliar with the students and teachers at Malaysia. Sometimes, kindergartens students are easily lost focus when teachers are teaching and we could receive complain that certain subjects are taught in less attractive ways consequently they did not focus during the learning session. Therefore, create the system with QR codes in their syllabus which can keep the attention of the kindergarten students during learning session by scanning a QR code and to engage students actively participate. The QR codes can be linked to the shortened URL generator. Then students can direct access to the online resources such as presentation slides, websites, and video by scanning the QR code using any kind of proper reading application. It is also an easy ways for students can make revision

by their own selves if they cannot follow the syllabus during lecture session. With the QR codes also can make classroom environment become more learnable, the QR codes will be placed in different areas of the room that can let students to a different online activities, content and videos which could make interaction with linked content.

1.2 OBJECTIVES

The following is the objectives of this project as shows below:

i. To develop a system with Quick Response (QR) codes for the pre-primary English courseware.

ii. To implement Quick Response (QR) technology in kindergarten courseware in an interactive way.

iii. To test the developed prototype to confirm the Quick Response (QR) codes can direct access to assessment of the Tadika Pendidikan Universal Genius.

1.3 SCOPES

The following is the scopes of this project as shows below:

i. Developed a web-based prototype with the Quick Response (QR) codes technology courseware for kids of Tadika Pendidikan Universal Genius which will concentrate in the part of pre-primary English.

ii. The assessments prepare within age 3-6 years old students for their syllabus and comprise with self-assessment module or exercise module for students and teachers to manage the assessment.

iii. The Quick Response (QR) codes technology is purpose for the age within 3-6 years old students and teachers. The correct answer would be shown after the students are complete the task.

1.4 REVIEW PREVIOUS WORK

This session will briefly discuss about the previous system which can be as a guideline or reference through this project. Below are some of the research studies regarding current project of the QR technology systems.

1.4.1 NATIONAL LIBRARY OF NEW ZEALAND [1]

New Zealand have a system named services to schools which was developed over 60 years ago to make sure all the books can be access for all school in New Zealand. It is supported literacy initiatives and school library transformation. It is web based systems include Integrated Library System (ILS) for twenty-four hours per weeks access to the resources. Besides that, in the National Library of New Zealand also provided a dedicated station with a web cam and QR reader application for students to easy search the location of the book.

A book cover in the library will be placed a QR code on it as an easy access ways which could link to video clip of the author reading their book and website with reviews of the book.

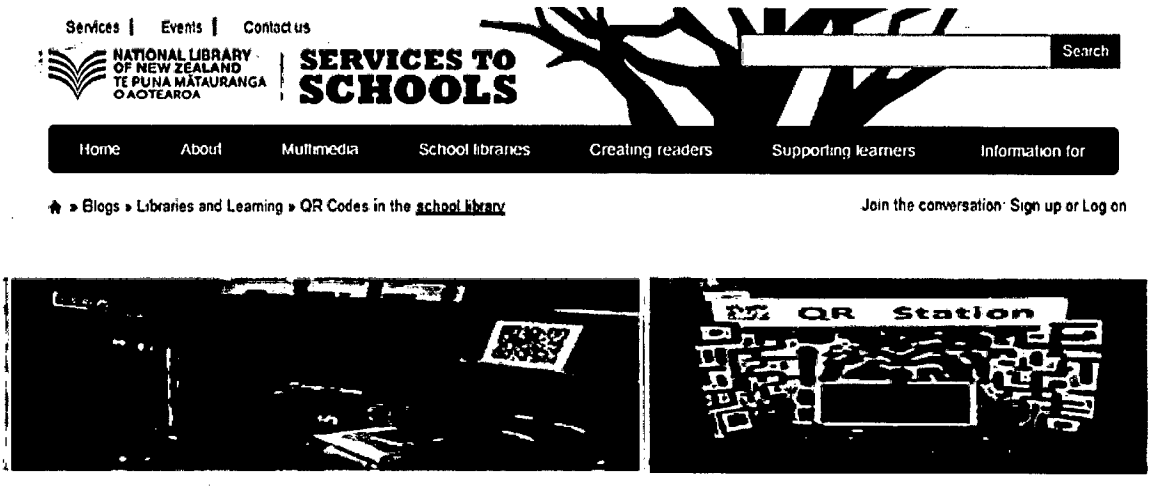

Figure 1.1: Dedicated stations which have webcam and QR reader applications for student to search book location and the homepages of the National Library of New Zealand homepages.

1.4.2 THE DARING LIBRARIAN [2]

It is a blogger and Tweeter that created by Gwyneth Jones from DC Metro in year 2006. She is the teacher librarian and technology specialist who has been awarded for her Daring Librarian blogger. Inside the blogger has been provides several of sharing information with the scanning the QR codes by any kind of scanner , then it will bring students to access into more detail information of the website. It is also a sharing blogger between school activity and the technology that been use of it during 21st Century Education.

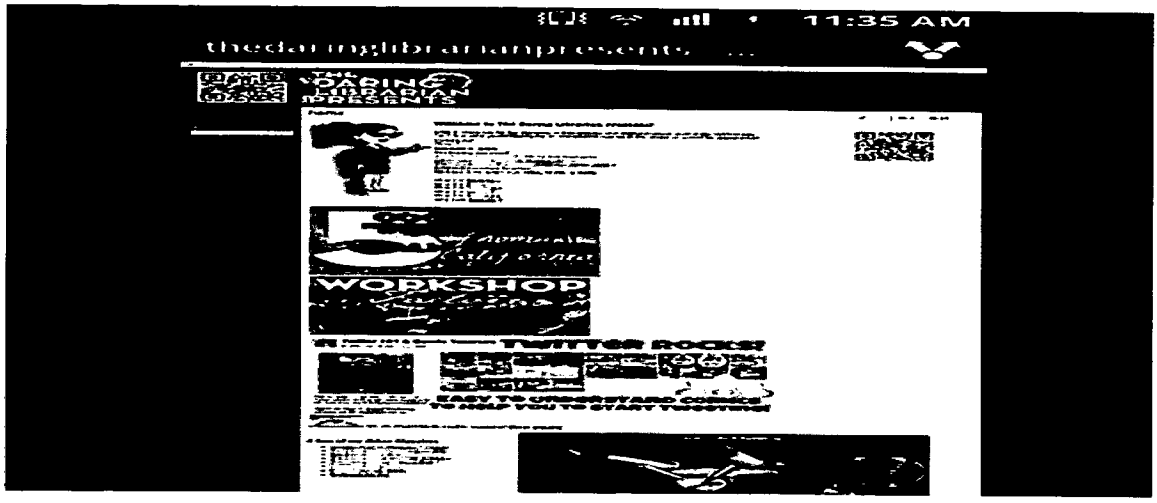

Figure 1.2: The interface that shows at the smartphone after scan the QR codes from website.

1.4.3 SET CONNECTION QR CODES [3]

The purpose of Set Connections is for educational field especially special education and to promote an overall understanding of technology with its benefit. The system has been uses in education with the QR codes which can let students come to scan the codes and the codes will direct generate and access for it without any input through a keyboard.

Below is some of the functionality of QR codes in educational field:

i. Have homework assignment with URL under code.
ii. Multiple choices of quizzes and tests.
iii. Online posters with QR codes have been created by students handed out to direct others to their online creations.

iv. Integrate QR with a reality game or service learning project where the code will be created by students and the codes will be linked to the content they created.

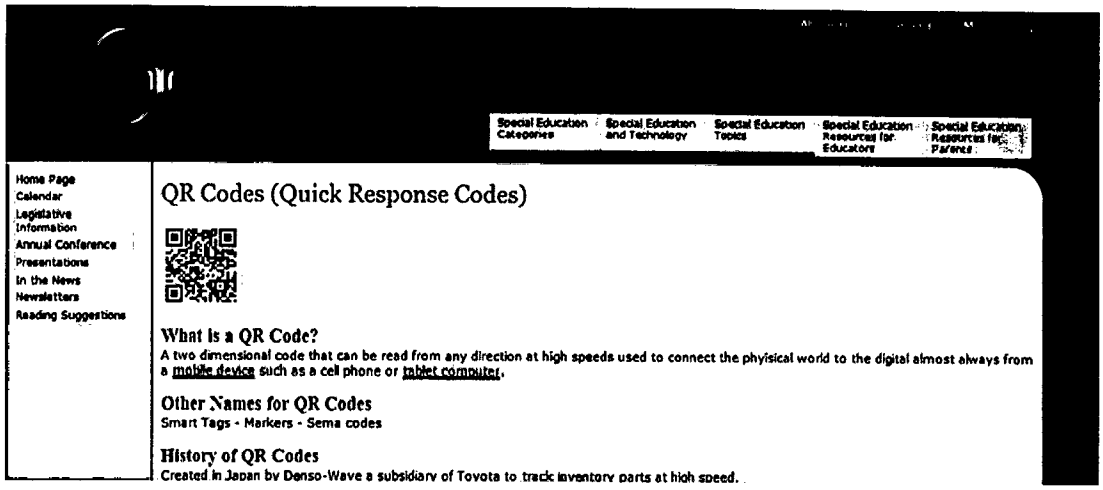

Figure 1.3: The homepages interface of the set connection.

1.4.4 ATTENDANCE APPLICATION PROGRAM WITH QR CODE JAVA BASED [4]

This application is about the recorded of the employees attendance with the QR code apply on it. QR codes can be scanned in any rotation and detect the identification absent employees of who have miss their presence recorded time and time out of Wirya Inovasi N.V. JMF and ZXing is the framework that used to create image processing that has QR code and create scanners.

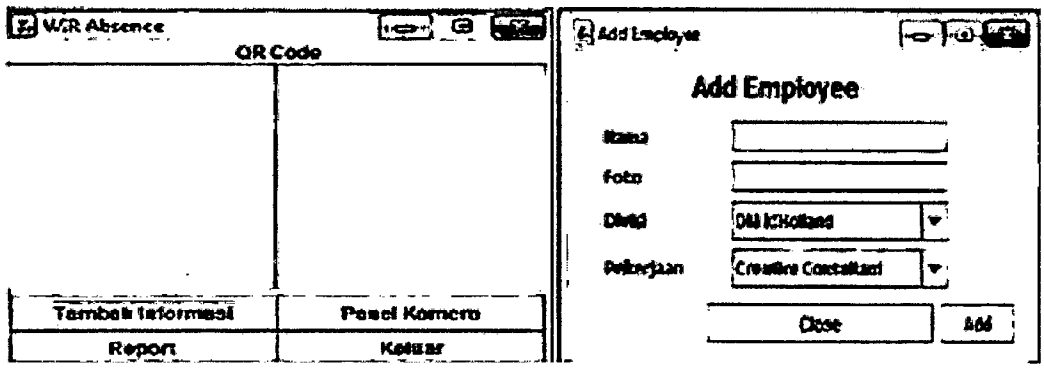

Figure 1.4: Main interface and add employee interface.

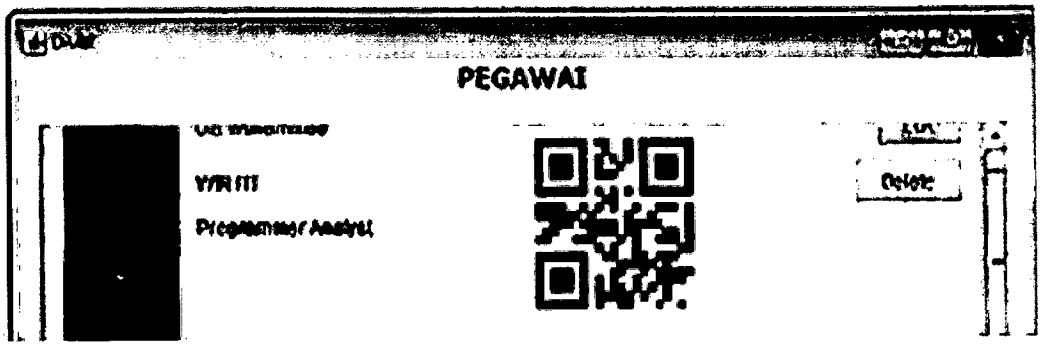

Figure1.5: Employee Graphical User Interface(GUI).

Figure 1.6: QR code scanning implementation with 90 degree rotation.

1.5 CURRENT SYSTEM AND LIMITATION

Table 1: Limitation of the teaching tools that use by teachers in the kindergarten.

Teaching tools	Description	Disadvantages and Limitation
i. Whiteboard	It is a non- electronic variation of the traditional rewriteable schoolroom blackboard, but we can write using a colored marker which is dry erase markers.	-It has the limitation space of the whiteboard to list down all the contents in one time that are going to teach. -Students loss concentration and they may feel difficult to see if they sit far behind from the whiteboard. - Delay of the time may occur when teachers or students got mistake of writing on the whiteboard. For example, teachers took time to draw a polygon shape on the whiteboard.
ii. Flash Card	It is a compact flash card with small data storage device that is used in electronic devices. Data can be transfer from one computer to another computer without printing out.	-Not all the students can fully participate and interact in the activity. -Students feel less visualizing and contextualization cause them less concentrate during learning session.

1.6 METHODOLOGY

In this section will discuss about the methodology that used in the development of Interactive of Quick Response (QR) Technology in Learning Session. Rapid Application Development (RAD) method was choosing to develop the system because RAD method it is suitable for the development of this system.

1.6.1 INTRODUCTION

RAD is a software development methodology that used to minimal planning in favour of rapid prototyping. Quality products with low cost can be developed faster by RAD method. RAD method consists of four phases such as requirement planning phase, user design phase, construction phase, and cutover phase.

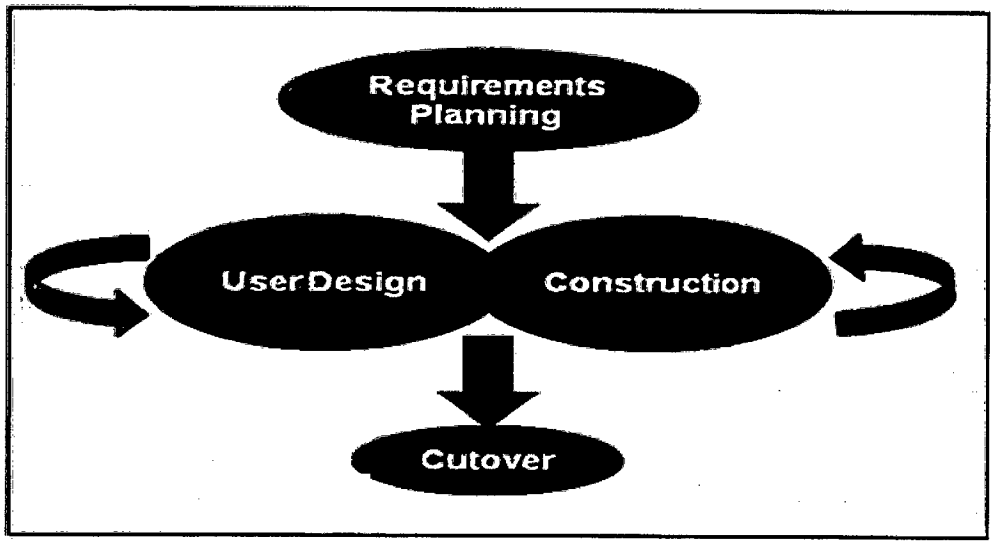

Figure 1.7: RAD methodology

For the RAD planning phase, specific requirement of the system will be collected and gather together to develop the system. Planning is important for the system development and should be conducted properly before the system development. Using RAD for the planning of the software developed is interleaves with writing the software itself. The lack of extensive pre-planning has allows software to be written much faster and the requirement is easy to change.

In the design phase, analysts convert the description of the alternative solution into logical and physical system specification. The interaction between process and data of the system will be clearly defined through creating data flow diagram (DFD). Besides that, system procedures are designed and user interface of screens are been developed for programmers to be return over to the construction phase.

Code will be generated in the construction phase as same as the database description for the final product.

While for the cutover phase which is the last phase for the RAD. Different kinds of actions are needed such as comprehensive testing, organizational change and the operation parallel with the previous system until another new system settle in.

1.6.2 REASON CHOOSE RAD

The following is the reason that RAD is chosen for development of Interactive QR Technology in Learning Session.

i. RAD methodology is suitable for the short time development.

ii. RAD methodology is suitable for develop system with medium size of the system seem this system mainly for admin, teacher, student at Tadika Pendidikan Universal Genius only.

iii. In RAD methodology in order to fulfill the user requirement aim, user need to work together with developer so that expected system can be develop. Teachers have given full commitment to provide information and their requirements during developed this system. Therefore, developer can mark as reference when develop this system.

iv. RAD methodology is a flexible and adaptable to changes.

v. A Prototyping application has given users a tangible description from which to judge whether critical system requirements are fulfill the system. Report output can make comparison with the existing reports. Data entry forms can be reviewed for completeness of all fields, navigation, data access (eg. radio buttons and checkboxes).

1.7 REPORT ORGANIZATION

This report consists of five chapters.
Chapter 1 is the introduction about the overview of the system. In the introduction, this system will discuss about the problem statement, objective, scope, previous work, current system and limitation, method and organization sequence of this report.

For chapter 2, it is discussed about user requirement specification. In this part contain the overall requirement of the system.

For chapter 3, we will discuss based on the design. In this part contain logical and physical design of the system.

For chapter 4, all is about implementation and testing phase. In this part, we will discuss how the system successfully develop, deploy and test by client.

For chapter 5, conclusion for the whole project will be made and also the future works suggestions for this project.

CHAPTER 2

2 SYSTEM REQUIREMENT

These sections are describing the system requirements needed to this system.

2.1 USER REQUIREMENT

The purpose of this chapter is about the specify software requirements of the Interactive of Quick Response (QR) Technology in Learning Session. The requirements will be presenting thought different types of diagrams such as use case diagram, context diagram, data flow diagram, dialogue diagram, entity-relation data model which can help to describe the interactions between tables and database and also textual descriptions to explain the concepts of the system.

The intended audience of this document is the users such as admin, teacher and student that involved in the development Interactive of Quick Response (QR) Technology in Learning Session.

2.2 FUNCTIONS

These sections describe the function of the system.

2.3 USER CHARACTERISTICS

To use this system just needed minimal skill only. There is no experience is required to use this system as long as have internet access and have application that can help to generate the QR codes.

Below are the general characteristic of the users for this system.

1. For those who want to use this system should be comfortable working with computer, laptop or smartphone.
2. User of the system should have basic knowledge of using graphical user interface (GUI) and capable to work with this system.
3. This system default language is using English; therefore user should be having basic knowledge of English language.

2.4 CONSTRAINTS

There are some constraints that limit the developer's options in this system.

1. Graphical user interfaces (GUI) only have one language which is in English.
2. User should register to have username and password to log in this system.
3. Internet connection.

2.5 ASSUMPTIONS AND DEPENDENCIES

2.5.1 ASSUMPTIONS

1. For the users, it is assumed that all the users are familiar and proficient with computer and internet browser. They are knowledgeable in using the application's GUI in Interactive Quick Response (QR) Technology in Learning Session.

2.5.2 DEPENDENCIES

1. Interactive Quick Response (QR) Technology in Learning Session is a web based system; it is depend on internet connection to scan the QR codes.
2. Interactive Quick Response (QR) Technology in Learning Session is depending on the hardware capability to execute properly such as smartphone whether are in good condition.