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Development of Mobile Academic Exhibition Information System to Support Achievement of Job Hiring Graduate Vocational High School

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Abstract. This study aims to develop the Mobile Academic Exhibition information system that presents a solution of at least a platform for students of vocational to share the work or final project used mobile device as a potential medium. The purpose of this information system development is to help vocational students identify the work in one container information system that can be seen by the community, which ultimately provides benefits for students to be seen by industrial. Mobile Academic Exhibition (MAX) development method using the development of Extreme Programming (XP), XP is the most widely used approach to software development through several stages, namely: (1). Planning; (2). Design; (3). Coding; and (4). Testing. The result data will be tested using the effectiveness test and done to 102 samples. The use of research instruments is used to collect qualitative data from random responders and is expected to produce valid data. The results showed that 92.4% of the vocational school students could be accepted immediately after the industry saw the students' projects uploaded in the MAX system, 7.6% of the vocational school students were not accepted due to other factors (administration, attitude and ability to work).

1. Introduction

The accelerated development of technology inevitably influences educational system within school, from elementary school, secondary school, to higher education. This accelerated development of technology encourages a brand-new approach of learning utilizing electronic media such as computer and any mode of technology employing online-based approach or what so-called Electronic Learning or E-Learning. Furthermore, E-Learning is recently being developed as Mobile Learning (M-Learning). Mobile Learning precisely defined by [1] as the intersection of mobile computing and e-learning: accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning, and performance-based assessment. E-Learning independent of location



in time or space. Pursuant to the aforementioned definition, hence mobile learning is a learning model utilizing information and communication technology. .

Not to mention, the accelerated technology exposed above likewise influence on the assignment or final project submission percentage which is submitted using paper beforehand and altered to become online-based assignment and final project submission—recently occurs within E-Learning (moodle, joomla, edmondo, etc). the utilization of E-learning as one channel of teacher-student interaction through online system provides unrestrained time for both accessing and assignment submission in accordance with teacher direction. Supplementary, E-learning model aims at facilitating accessible and straightforward discussion between students in order to enable effective feedback and the exchange of information. Yet, it does not serve as a channel for exposing students' work. Presumably, responding to the above-mentioned issue, it is necessary to expose and display students' work in certain information system in order to provide an opportunity of industry concerned to access the work for further consideration of selecting the employee during Job Hiring. The utilization of information system will be further provided by mobile access which is usable efficiently.

Therefore, to provide a channel for displaying students' work, an information system named Mobile Academic Exhibition (abbreviated as MAX) is developed within this present study. This information system aims at providing a channel for displaying Vocational High School students' work to make it accessible nationally and does not only end in the school. Pursuant to the prominent objectives of Vocational High School in Indonesia, able to generate a proficient and competing graduates, it further aims at encouraging Vocational High School Students to create a qualified work which can compete both nationally and internationally. According to the aforementioned explanation, the authors intend to develop MAX information system (Mobile Academic Exhibition). It is a mobile-based application to enhance Vocational High School students' motivation in learning as well as displaying students' work in order to be accessible for public, industry, and other students to encourage in creating innovative works.

2. Literatur Review

2.1. *Mobile Academic Exhibition (MAX) Information System*

Information system is a combination of human beings, technology, media, procedure, and control which aims at administering either management process or any transaction requiring proper decision making. According to [2], the development of the system also requires ingenuity in order to generate effortless system. In line with the above-mentioned outline, information systems is used to help human beings in simplifying the work, ranging from sales, reservations to setting online-based activities. The system was developed to refer to the concept of user friendly and efficiency of use over time, in this case the MAX information system has advantages in apparent use.

2.2. *Specific Vocational High School Job Market*

Specific Vocational High School job market is a job market established in Public and Private Vocational School as an implementing unit that provides services and job vacancy information, marketing executor, distribution and placement of employment, is a partner of the Department of Labor and Transmigration which aims to provide information job vacancies and provide a channel to help Vocational High School students to look for a job. BKK (specific job market agency) official website can be accessed at the official site vocational training directorate at the address (<http://bkk.ditpsmk.net>) which can be accessed by the public. According to [3], conformity of the work with the field also greatly affect the comfort of work and working environment, it is becoming one of the inspirations for the development of the MAX information system which also support BKK in providing job vacancy for Vocational High School graduates in accordance with the competence. BKK basic concept is also used in the MAX information system to be able to post job announcements and post comments.

2.3. Extreme Programming (XP)

Extreme Programming development methodology hereinafter abbreviated as XP is one of the many methodologies in software engineering and is also part of agile software development methodologies. In general, XP can be described as a software development approach that tries to improve the efficiency and flexibility of a software development project by combining simple or uncomplicated ideas without reducing the quality of software to be built. XP was developed by [5] and is a lightweight software development discipline based on four core values. The Core Values consists of 4 cores as follows.

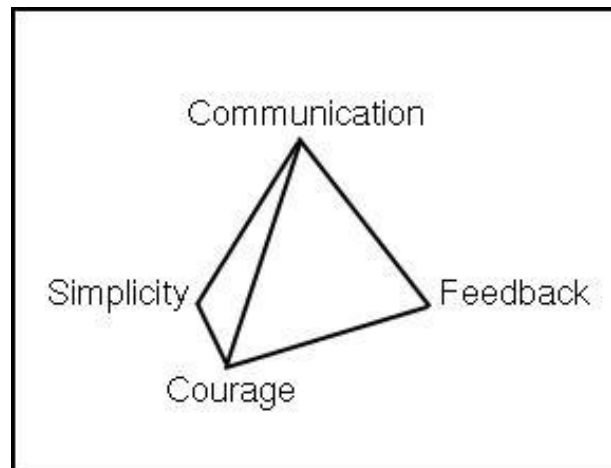


Figure 1. 4 Core Extreme Programming
(Source: [5])

Communication is a major cause of software development failure, thus XP focuses on good communication links between team-clients, team members, and project managers. Communication in XP is built by performing pair programming. Clients should be involved in the software development process with the aim of providing developer views in accordance with the views of users regarding the built system; b). Simplicity. XP methodology is functioned simple and practical without reducing its main function, using a short and simple method, not too complicated in making the design. 3). Feedback. Feedback on the XP methodology is enabled to identify possible errors and can directly evaluate the project; 4). Courage. On this core, XP programmers are encouraged to dare to experiment and rewrite code if they are not satisfied with existing code or design. This helps maintain the morale and intersiveness of the project developers and can support further communication with other project members.

According to the four core value above, [5] further explains to 12 core stages of XP: (1). Planning game. This phase uses the term game to use score card techniques in determining requirements; (2). Small releases. Small releases is functioned to make quick stages in the development cycle; (3). Metaphor. Communication between client and programmer should be continuously tied, (4). Simple design. Applying simple design without eliminating its main function; (5). Testing. Testing is done on every software unit in scope as small as possible rather than waiting until the entire software is finished; (6). Refactoring. Making changes to the program code of the software with the aim of improving the quality of the structure of the program without changing the way the program works; (7). Pair programing. Two programmers work together to complete the project; (8). Collective Ownership. Exchanging ideas in one project; (9). Continous Integration; The more program builders the more syntax error are minimized; (10). 40-hours Week. Work rules should not be more than 40 hours per week as a rule; (11) .on-Site Customer. Always responsive and quick in answering customers; (12). Coding Standards. Emphasizing the rules and regulations of each programming in a project.

3. Method

The purpose of this research is to develop MAX Information System as a place for students to publish and display students work that can be seen by the industry, public and other students. MAX information systems was developed through the development method of Extreme Programming (XP). The use of XP is pretty much popular, particularly for the development of information systems based on mobile with the few number of programmers, and demands a plenty of revisions in its development [6]. XP is a model that included the agile approach introduced by [5]. According to the explanation, the definition of XP is as follows: "Extreme Programming (XP) is a software development method that is fast, efficient, low risk, flexible, predictable, scientific, and fun." This model tends to use the Object-Oriented approach. Stages that must be passed include: Planning, Design, Coding, and Testing. Target Extreme Programming is a team that formed not too much between 2 to 5 people. This is intended to deal with unclear requirements and rapid changes in requirements. Extreme Programming is the most widely used agile method and is a very popular approach, XP development stages are described as follows:

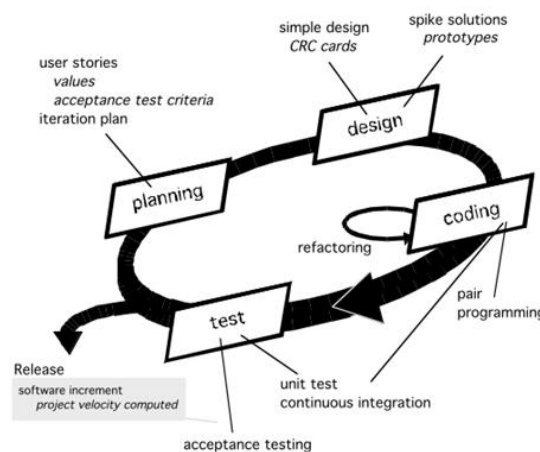


Figure 2: XP Development Stage
(Source: [5])

Planning During the phase of planning, it is started with the collection of data which helps technical team to understand and comprehend the business context of the application. In addition, this phase also defined the output generated, features of the application and the function of application developed. **b) Design.** This phase emphasizes on the simplicity of the application design. To design the application, Class0Responsibility-Collaborator (CRC) card which identify and manage class on object-oriented program was employed. **c). Coding.** The primary concept of coding phase in extreme programming is pair programming. It involves more than one individual to code for an application. **d). testing.** This phase focuses on the testing of features and functions of application. According to [7], XP method efficiency is feasible to be set into programmed scenario. However, within the development of MAX Information System, it is not recommended to be employed. During the phase of testing it involved four Vocational High School around Malang. It aims at testing the Information System randomly to generate a decent validity degree. Table 1 presents the detail of information system users.

Table 1: Research Sampling Distribution

No.	Vocational High School	Sampling
1	SMKN 3 Malang	25
2	SMKN 4 Malang	20
3	SMK Islam Batu	32
4	SMK Brawijaya Batu	25
Total		102

4. Results and Discussion

This present study aims at developing MAX information system employed to assist students in publishing their works in one information system application integrated with BKK online. Table 3 illustrates Use Case Information System.

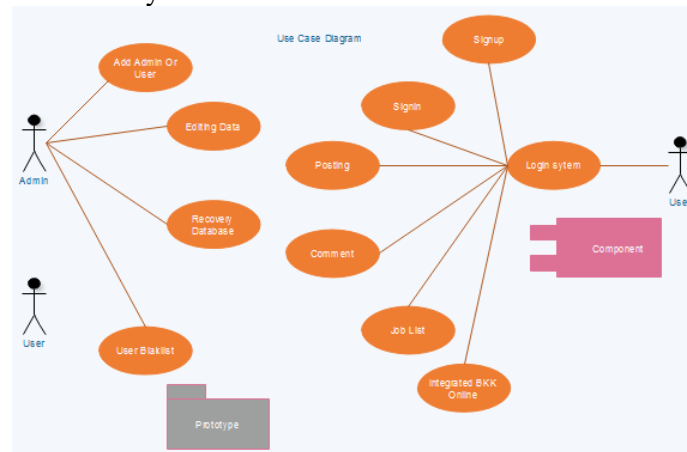


Figure 3: Use Case MAX Information System

The development phases of MAX Information System are divided into four processes of information system development. In each phase, it generates an output for complete project. The process of development is presented in Table 2.

Table 2. The Development Phases of MAX Information System

No.	Process	Description	Output
1	Planning	Planning on program flowchart until its functions	Use Case and MAX Information System DFD
2	Design	Designing User interface MAS Information System	MAX Information System Blue Print
3	Coding	HTML and CSS programming and errors identification	Framework-based Interface Design
4	Testing	Program Error Testing through System Validation	System validation and error handling on possible error within the system of MAX Information System

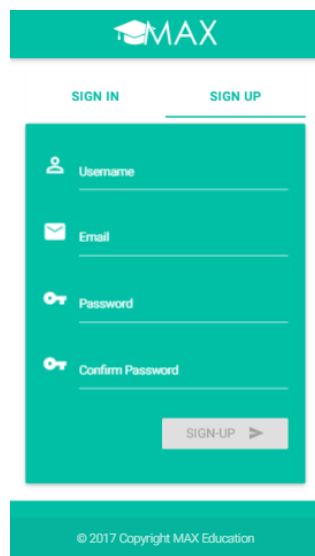
After development phases was performed, then Effectiveness and Efficiency of Interval validation on system was carried out employing questionnaires and was distributed to 102 sampling in Vocational High School around Malang. The detail of the effectiveness and efficiency is presented in Table 3. The effectiveness testing is based on competence research pattern which relies upon mobile device usage [8].

Table 3. Effectiveness and Efficiency Interval Testing

No.	Category	Interval	Frequency	Percentage
1.	Very High	10 – 30	40	40%
2.	High	23 – 50	52	52%
3.	Moderate	1 – 22	10	10%
4.	Low	1 – 50	0	0%
5.	Very Low	1 – 50	0	0%
Total			102	100 %

From the questionnaire data, it obtained the item of 1-50 which indicates that MAX Information System provides the effectiveness of vocational high school job hiring equal to 10% and is considered moderate, 52% on the high category, and 40% on the very high category. The data on questionnaires was collected through random sampling amounted to 102 respondents.

MAX Information System Interface



The MAX Sign Up Form is a teal-colored interface with a header bar containing the MAX logo. Below the header, there are two tabs: 'SIGN IN' and 'SIGN UP'. The 'SIGN UP' tab is active. The form contains four input fields: 'Username', 'Email', 'Password', and 'Confirm Password'. A 'SIGN-UP' button is located at the bottom right of the form. At the bottom of the screen, there is a copyright notice: '© 2017 Copyright MAX Education'.

Figure 4. MAX Sign Up Form.



Figure 5. Home Menu MAX

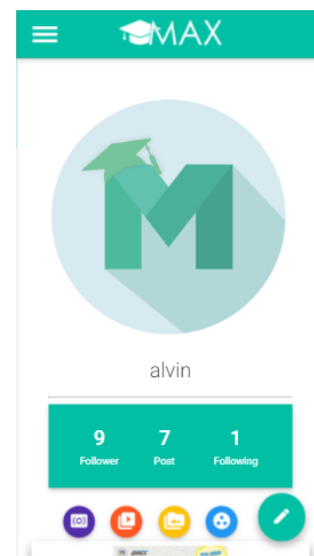


Figure 6. Work Poster

MAX Information System for registering an account. It composes of Username, Email, Password and Password Confirmation columns. Figure 5 is a user form. If post button is clicked, then user is able to share the activity in the form of photos, videos, files, and links. In Figure 6, the instance of user publication regarding job vacancy poster or any activity that can be input by user within the information system is presented. Then in Figure 7, it illustrates form to upload students' work content along with the details of the work such as title, date created, and file of the work. The data validation of information system is validated by validator of information system expert, web-programming expert, and industry information system developer. The result of validation is presented in Table 4.

Table 4 Information System Trials Result

No.	Assessment Aspects	Total	Average Percentage
1.	Information System Effectiveness	4 aspects	100 %
2.	Information System Attractiveness	5 aspects	97,5 %
3.	Information System Efficiency	5 aspects	96,9 %
Total		14 aspects	98,5 %

According to Table 4 regarding the criteria of feasibility obtained from information system expert, overall, it indicates that information system developed is considered good. The average results of assessment aspects obtained from information system validator expert is 98.5%. therefore, MAX information system is valid and needs no revision.

5. Conclusions

First, MAX Information System development to assist Vocational High School graduates job hiring is effective and efficient. It is proven by the percentage of average results from system validator expert of 98.5% which is considered as high category for system usage category. In addition, the results from respondents involving four schools, state and private school, obtained the score of 52% and considered as high. This means that system is normally running and accessible to be used. Second, in accordance with the development of XP, this information system is upper-hand in terms of usage on mobile application and provides benefits in terms of time effectiveness. However, during the testing phase, it occurred an issue within an area of database. It seemed unresponsive the moment the database receives the file capacity more than 100 MB. Third, the response from Industry is positive regarding the development of this mobile application. It is confirmed by the score given by the information system validator expert. The expert is the senior staff who is often to take a decision regarding employee acceptance. Four, pursuant to the findings and discussion, the suggestions imposed for further development is the needs of responsibility adjustment regarding multiplatform development popular within society. The platform intended are IOS, Blackberry OS, and Windows Phone. Although no issues found during the system running, a system interface is rather different (no effect on functions).

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