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Prototype of Personal Knowledge Management on Higher Education

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Abstract **− This study proposed a prototype of personal knowledge management system on higher education. Personal knowledge management system is a method that used by person to manage his own knowledge. The knowledge will be classified and stored in the databases system and retrieved when needed. This study is focused for the students who take courses during undergraduate program period. All academics activities will be recorded in the system and published as portfolio on the end of study as a complementary document along certificate and transcript. This prototype offers the students to manage their knowledge from their projects, prototypes, patents, researches, seminars and work experiences.**

Abstrak **− Penelitian ini mengusulkan sebuah prototipe *personal knowledge management* (PKM) pada pendidikan tinggi. PKM adalah sebuah cara yang dilakukan oleh seseorang dalam mengelola pengetahuan yang dimilikinya secara mandiri. Pengetahuan tersebut kemudian diklasifikasikan dan disimpan dalam sebuah sistem yang selanjutnya dimanfaatkan kembali apabila diperlukan. Penelitian ini difokuskan kepada mahasiswa yang mengambil kuliah pada program sarjana. Semua bentuk aktivitas akademik akan direkam oleh sistem yang selanjutnya dipublikasikan dalam bentuk portofolio di akhir masa belajar sebagai dokumen pelengkap selain sertifikat dan transkrip. Prototipe ini menawarkan kepada mahasiswa sebuah aplikasi untuk mengelola pengetahuan mereka dari proyek, prototipe, paten, riset, seminar dan pengalaman kerja mereka.**

Kata Kunci **− personal knowledge management, portfolio, pendidikan tinggi**

I. INTRODUCTION

One of the major challenges for the Higher Education (HE) providers is how to treat the students who have heterogeneous backgrounds. They came from divers places, cultures and educational backgrounds. Each of them has different knowledge and experience to solve the problem and make the decision [1]. Hence, the HE providers should create the best strategy in managing the students knowledge in order to complete their education well.

Knowledge management (KM) is a set of activities that is needed to get as much as possible of knowledge resources [2]. The activities may include create, capture, refine, store, manage, and disseminate the knowledge [3]. They should be explicitly and systematically managed [4] and involves people, technology and process in overlapping parts [5].

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One of the strategy can be conducted is supervising the student to manage their knowledge during study and then utilize it in many necessaries. In managing the knowledge, providers do not just hand over it to students themselves, but the providers also facilitate to be more easily, structured and well targeted.

This facility is information technology (IT). IT has become strategic role in knowledge management system. IT can be utilized to track, store, manipulate and distribute information to the appropriate people when necessary [6]. In HE environment, the major challenge of providers is coordinating between KM technology and organization process to achieve the performance [7]. IT helps HE providers to get right people at the right time to take the right decisions [8]. In addition, the using of adequate IT system supports to make a strategic decision making [9].

In the implementation, students solely manage their knowledge on the system provided by HE. In this case, the students complete the knowledge form on the system during study. On the end of their study, they can print the knowledge document as a complementary document along certificate and transcript.

The implementation of personal knowledge management in the higher education is strongly recommended to be developed soon. Undergraduate students has more capability to learn independently than their younger brothers. Moreover, they express their academics expertises in a recognized documented form, such as research articles, seminars, internship certificate and other activities.

Hence, in this study the author proposes a model and application prototype to accommodate the student academics activities. Through this application prototype, the knowledge management in the individual level can be optimized.

II. RELATED WORKS

Some researchers focused to the implementation of KM within organization. Some of them defines the KM by managing the knowledge simultaneously to meet all the divers organization needs [1]. The needs of KM on the organizations are different with others. As well as the HE environment.

Some researchers also review about knowledge management in HE environment. Munir and Rohendi mention that the aim of KM in HE includes two types; academics knowledge that aims to cover academics purpose, and organization knowledge that captures organizational process [10]. These knowledge are arranged as en explicit

knowledge in form of documents, procedures and result of tacit knowledge such as experiences, judgements, view and perception residing the individuals [11].

Furthermore, another study describes about how the KM in higher education is developed. KM in the higher education is not only focused on the application system, but also involves the HE vision, HE culture, management support, technology, education dan motivation and maintenance [12].

III. METHODOLOGY

The author conducted the research and development method to complete this study. Firstly, the author collected and reviewed the supported literatures. The author observed at one of higher education in Malang.

Second, the author developed a model and prototype to accommodate the requirements. In this discussion, the author proposed the model of personal KM for undergraduate students and introduced an application prototype to based on responsive web. Lastly, the author reported the result of prototype testing by functional testing to ensure the basic requirements needed worked well.

A. Collecting the Data

Data is collected by observation on the Department of Informatics, University of Muhammadiyah Malang. This task includes student activities, credit and final grading system. The student gets two documents at the end of their study: certificate and transcript. The author proposes the student portfolio as a complementary document of the those documents.

B. Designing the Model and Prototype

Firstly, a conceptual model must be defined. Second, the model is derived to the application prototype. It needs to list the requirements needed in order to complete the functional needs.

C. Developing and Testing the Prototype

The last process is develop and test the prototype. Prototype is developed to be web based application and tested by functional testing. This study is limited to the system development.

IV. RESULTS

A. The Proposed Model

The model of personal KM was developed based on the business process inside HE. Some department require the students to program internship, manage the project, conduct the research and seminars and other academics activities. The output of the tasks is documented skill, experience and expertise. Those documents are then stored into HE storage.

At the end of student's study period, all academic achievements will be generated as a portfolio. The portfolio can be used as complementary document along student certificate and transcript.

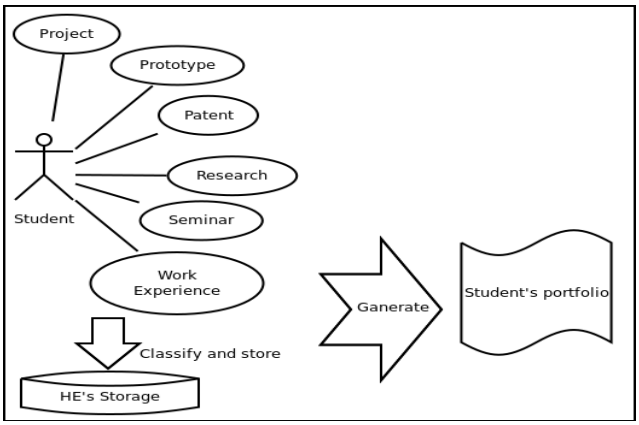

Figure. 1 Model of Personal KM

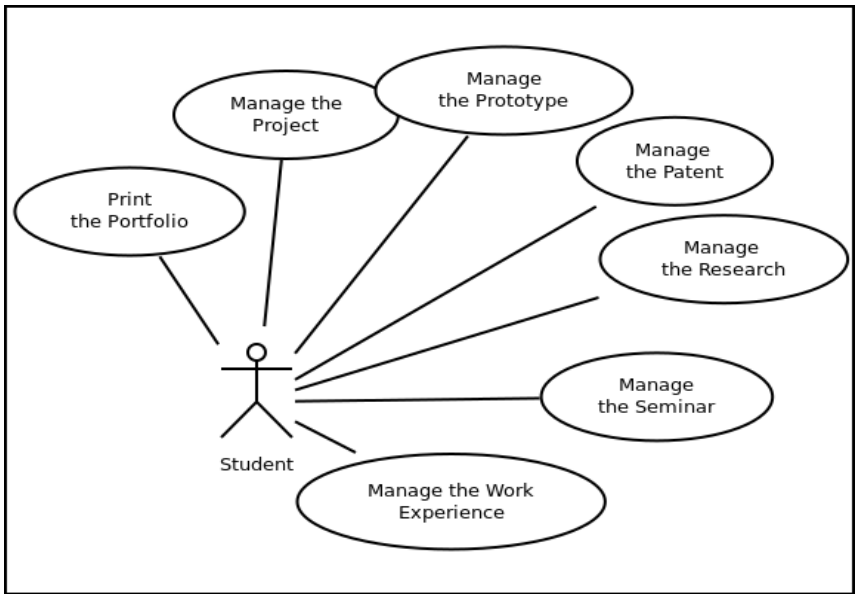

Figure. 2 Usecase diagram

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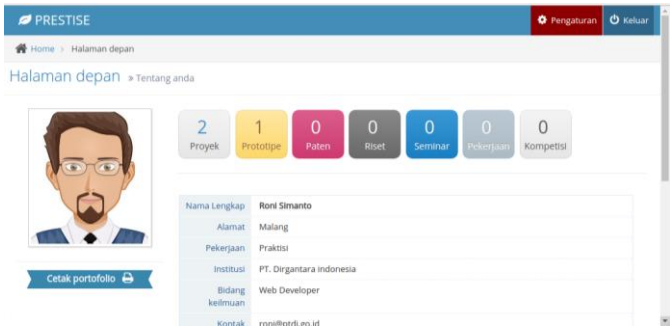

Figure. 3 Prototype front page

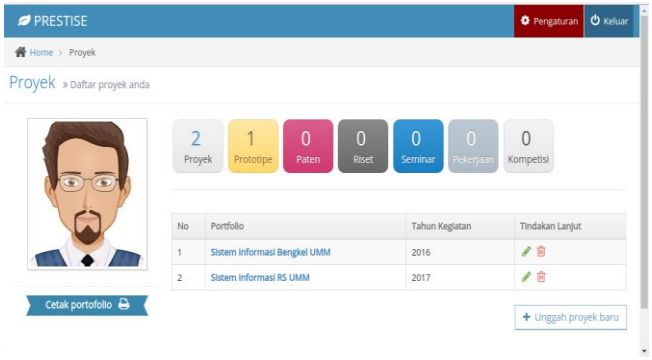

Figure. 4 Document management

Figure.5 Print the portfolio

B. *Application Prototype*

The application prototype is designed to accommodate the model above. It offers the students to manage their expertise in project, prototype, patent, research, seminar and work experience. The students can also generate their expertise as portfolio document and print it. The functional requirement can be expressed by usecase diagram as shown at figure 2.

As shown in figure 2, this prototype provides the students to upload their expertise document, such as project document, etc. Student can also manage the document, such as adding, updating and removing the expertise. It is arranged by type of portfolio provided the system, as shown at figure 4.

TABLE I
FUNCTIONAL TESTING (BLACK-BOX TESTING)

Feature	Requirement	Observation
Registration	Student inputs biodata	Successfully saving data
Login	System validates the registered user	Successfully identify the registered user
Add portfolio	Student uploads new portfolio (project, prototype, etc.)	Successfully saving the portfolio
Show the list of portfolio	System shows the list of portfolio	Successfully displaying the list of portfolio
Update/Edit Portfolio	Student edits portfolio (project, prototype, etc.)	Successfully updating the portfolio
Delete Portfolio	Student removes portfolio (project, prototype, etc.)	Successfully removing the portfolio
Generate portfolio document	System generated portfolio document	Document is generated imperfectly. It is need to be debugged.
Printing the portfolio document	System prints the portfolio document	Document is displayed imperfectly. It is need to be repaired.

The last application module is printing the portfolio document. This prototype allows the student to print their document by clicking print button “cetak portfolio”, as shown at figure 5.

C. *The Functional Testing*

The application prototype has been tested and run well, except some modules displayed imperfectly. It is tested by functional testing as known as black-box testing. This method is conducted by running all functional module.

V. CONCLUSION

The proposed model offers a conceptual knowledge management of students by recording their best practices along the period of study. It shows that all academic practices is classified and stored in HE’s storage.

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