The Prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone

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บทคัดย่อ—การวิจัยเรื่อง การพัฒนาแฟ้มสะสมผลงานอิเล็กทรอนิกส์ ผ่านทางสมาร์ทโฟนในรูปแบบแอพพลิเคชั่นจำลอง เพื่อศึกษา และพัฒนาแอพพลิเคชั่นให้ผู้ใช้สามารถสร้างและเก็บรวบรวมเนื้อหาผลงานของตนเอง ผ่านทางโทรศัพท์มือถือ โดยการพัฒนาแฟ้มสะสมผลงานอิเล็กทรอนิกส์ ผ่านทางสมาร์ทโฟนในรูปแบบแอพพลิเคชั่นจำลองนี้ พัฒนาด้วยโปรแกรม Adobe XD ซึ่งรองรับในระบบปฏิบัติการไอโอเอส (iOS) เป็นต้นแบบ โดยมีวัตถุประสงค์ของการวิจัยคือ 1) พัฒนาแฟ้มสะสมผลงานอิเล็กทรอนิกส์ ผ่านทางสมาร์ทโฟนในรูปแบบแอพพลิเคชั่นจำลอง 2)ในการประเมินผล นำประโยชน์ในการประเมินผลไปสู่ประสิทธิภาพการเรียนการสอนได้ กลุ่มตัวอย่างที่ใช้ในการวิจัยโดยใช้วิธีคัดเลือกกลุ่มตัวอย่างแบบเจาะจงคือ นักศึกษาคณะวิทยาศาสตร์ ชั้นปีที่ 3และปีที่ 4 สาขาวิชาเทคโนโลยีการจัดการอุตสาหกรรม วิทยาลัยเซาธ์อีสท์บางกอก จำนวน 43 คน ที่กำลังสำเร็จการศึกษาและกำลังสร้างแฟ้มสะสมผลงานของตนเอง เครื่องมือที่ใช้ในการดำเนินงานวิจัยได้แก่ 1) โปรแกรม Adobe XD สำหรับพัฒนาแฟ้มสะสมผลงานอิเล็กทรอนิกส์และ 2) แบบประเมินความเข้าใจต่อแฟ้มสะสมผลงานอิเล็กทรอนิกส์ ผ่านทางสมาร์ทโฟนในรูปแบบแอพพลิเคชั่นจำลอง สถิติที่ใช้ในการวิเคราะห์ข้อมูลประกอบด้วย ค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐาน ผลการวิจัยพบว่า ผลการประเมินความเข้าใจต่อแฟ้มสะสมผลงานอิเล็กทรอนิกส์ ผ่านทางสมาร์ทโฟนในรูปแบบแอพพลิเคชั่น จำลอง อยู่ในระดับมาก ค่าเฉลี่ยโดยรวมอยู่ที่ 3.73 ส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.66

คำสำคัญ: แฟ้มสะสมผลงานอิเล็กทรอนิกส์, สมาร์ทโฟน

Abstract—The study objectives of The Prototype of Electronics of Portfolio (E-Portfolio) Application on Mobiles Phone were to examine and to develop the application that allows users to create and to collected documents on mobiles phone, with developing E-Portfolio Application on Mobiles Phone through Adobe XD, which is iOS system operated. The study aimed to 1) Develop The Prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone 2) Examine for outcomes and improve on efficiency of Education with purposive sampling 43 students in Bachelor of Science Program in Industrial Management Technology at Southeast Bangkok College who are graduating and creating ones' own portfolio. Research tools are 1) Adobe XD for developing E-portfolio and 2) The evaluation of satisfaction in the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone. Statistic Data Analysis includes mean and standard deviation and research found that the level of the satisfaction of the developing the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone is high, mean is about 3.73 and standard deviation is about 0.66

Keywords E-Portfolio; Mobile Phone

I. INTRODUCTION

Portfolio creates higher degree of Students and Educational Personnel to be able to present ones' Expertise and Potential in a wide variety of fields. It is an alternative method to evaluate and put the evaluation into efficiency in teaching and learning. Developing E-Portfolio Application on Mobiles Phone is able to save and collect evidence digitally. It is a tool to create E-portfolio to collect texts, photos and any documents that requires no document printing. It allows examiner to log in and examine E-portfolio on mobiles phone. Therefore the study aimed to develop the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone for users to create and collect information on mobiles phone, which is one of widespread devices and easy to access at the moment.

The LinkedIn what there are a popular in social network for E-portfolio as part of the new experience, requesting an introduction to contact someone through connections you have in common is temporarily unavailable on LinkedIn. The LinkedIn "Ask for an introduction" feature allows you to reach employers who you don't know through people who you do. In addition, my research developed to target the user to create and to collected documents with E-portfolio "Ask for evaluation in teaching and learning in educational".

II. OBJECTIVES

1) To study and design the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone

2) To study the evaluation of satisfaction in the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone.

I. CONCEPTUAL FRAMEWORK

Independent variable is to develop the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone.

Dependent variable is the evaluation of satisfaction in the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone.

II. THEORY AND RELATED RESEARCH

1) Related theory

•E-Portfolio [1] An electronic portfolio (known as E-Portfolio) is a collection of evidence assembled and managed by Personnel
or Organization, usually on the web. E-portfolio is demonstrations of the user's identity, philosophy, achievement, skills, abilities, and works through electronics media. Data and Information are collected in hard copy portfolio to evaluate the achievement in learning or working.

E-Portfolio includes

1) Objectives of E-portfolio.
2) Data content of E-portfolio.
3) E-Portfolio Development.
4) Self Evaluation.
5) Electronic Management system
6) E-Portfolio Evaluation.

•Application [2] Application is simply called an app. It is a type of software that allows you to perform specific tasks. Applications for desktop or laptop computers are sometimes called desktop applications, while those for mobile devices are called mobile apps.

• Smartphone [3] A smartphone is a handheld personal computer, which has more functions than mobile phone. It is able to connect the Internet, update and download applications to enhance its own abilities depended on platforms mobile operating systems. There are 2 most popular operating systems, which are

1) iOS is a proprietary mobile operating system developed by Apple Inc. primarily for its product line, which are iPod, iPad, and iPhone. The advantages of iOS are iOS contains various applications available on App Store and iTunes. Its application menu is fast and easy to understand. Its Web Browser (Safari) also has a quick response. The disadvantage of iOS is that user is not able use multitasking, for example; listen to music and open Web Browser and the same time.

2) Android is an operating system developed by Google. It is an open source platform. Since it is non-proprietary, most of smart phone and Tablet manufacturers including HTC and Samsung Galaxy pick out android to be operating system. The advantages of Android are to offer open standard to make various applications for users. Android is able to connect conveniently to Google features including Gmail, Google talk, Google Maps and Google search Engine. The disadvantages of Android are iOS has more flexibility than Android. Since it is open source platform and devices have a variety of screen sizes, therefore some devices may face troubles.

•Mobile Application [4] It is a combination of 2 words Mobile and Application. The definition of Mobile is a handheld communication device. It can be used basically as telephone, and also works as computer. Since it is handheld device therefore its dominant features are small-sized and less battery usage. It is used to exchange information at the present. The definition of Application for computer is software, which is made for user in working.

Application must have User Interface (UI) to be an intermediary in any command. Mobile Application is application development for mobile devices including smartphone and Tablet. The program will also serve the needs of consumers as well as encourage users to use the phone easily. At the present mobile phones or smartphones have many of the operating systems that come out to consumers. The most popular ones are iOS and Android

therefore the number of writing or increasing slightly including Map, Game and communication software. Some businesses emphasize on mobile application to enhance commutation method with customer. For example popular installed application "Facebook" which can share your information widely including feelings, places, photos, through the application and no need to open web browser.

2) Related Researches

The research topic of electronic development on iPad for students in kindergarten 3 at Beaconhouse Yammsaard School. The study aimed to 1) Develop E-book (topic: Parts of our bodies) on iPad for students in kindergarten 3 to be effective by 80/80. 2) Comparison between pre-test and post-test of kindergarten students after learning from E-book (topic: Parts of our bodies). 3) Study the effectiveness index of students after learning from E-book (topic: Parts of our bodies) 4) Study coefficient of variation in teaching effectiveness after learning from E-book (topic: Parts of our bodies). Research samples are 30 students in kindergarten 3 who study in additional experiences subject at Beaconhouse Yammsaard School with random sampling. Research tool contains E-book (topic: Parts of our bodies), pre-test and post-test. Statistic Data Analysis includes percentage, mean, standard deviation and t-test. The research found that 1) E-book (topic: Parts of our bodies) has the effective rate at 84.16/84.16 and meets 80/80 standard and the quality is very good. 2) The results of students' post-test score is higher than pre-test score which means it is statistically significant at the .05 level. 3) Effectiveness Index of E-book is 0.66 and 4) Coefficient of variation of making E-book is 7.90, which is considered in Good quality. [5]

The research topic of Dog HealthCare program Development is applied research and aimed to study and develop Dog HealthCare application on smartphone that is Android operated. Using JAVA language and SQLite develops this application as a database with emphasizing on collecting information of dogs to notice dog owner to get dog vaccinated on appointment. Tips for taking care of dogs every breed. Food to avoid feeding dogs. Basic diagnosis from observing dog symptoms. The outcomes of application development would serve convenience to dog owner as well as be able to take care of dogs to be more effective. The evaluation from related user shows that the overall satisfaction rate 4.35 from 33 users and coefficient of variation is 0.60, which is considered in good quality to use. [6]

III. RESEARCH METHODS

1) Population and sample

Research population is 200 (3rd - 4th year) students in Bachelor of Science Program in Industrial Management Technology at Southeast Bangkok College. [7]

Purposive Random Sampling is used for 43 Research samples that are in Bachelor of Science Program in Industrial Management Technology at Southeast Bangkok College.

2) Research Procedures

According to the study of The Prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone, researchers use Addie Model [8]
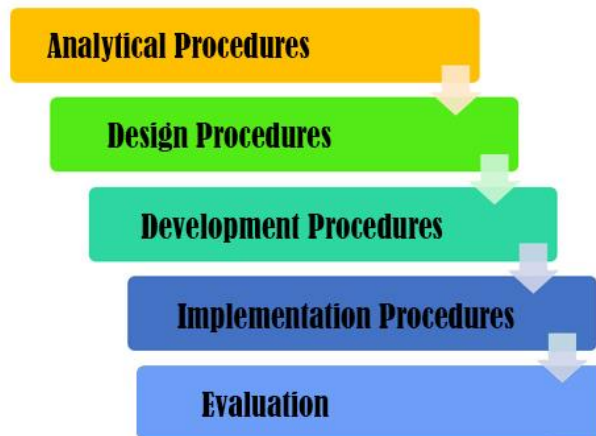

Figure 1. The framework of the prototype of E-Portfolio

The procedure to study and design the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone as following in figure 1, there are an analytical procedures, a design procedures, development procedures, implementation procedures and evaluation.

• Analytical Procedures

Researchers have studied and analyzed development procedures and data collection regarding the Prototype of E-Portfolio Application on Mobiles Phone to guide summary of information.

Figure2. Information, Portfolio and Document

For information, portfolio and document as following in figure2. Carrying own paper information, portfolio and others document is inconvenient.

•Design Procedures

The conclusion after analysis moves on to layout design and designs a way to present it via a smartphone with simulating the form the application in order to set topics of functional works and prepare to manipulate and develop in the next step.

• Development Procedures

Researchers have developed the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone with structure designed in Adobe XD.

• Implementation Procedures

Researchers have adapted the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone in 43 students in Bachelor of Science Program in Industrial Management Technology at Southeast Bangkok College, and evaluating for understanding in topics of functional works of the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone to bring outcomes for evaluation.

• Evaluation

Researchers have Data analyzed and evaluated the outcomes from The evaluation of the satisfaction to develop the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone with statistical package including mean and standard deviation.

3) Research tool

Research tool includes

• The prototype of Electronics Portfolio (E-Portfolio) Application on Mobiles Phone

• The evaluation of the satisfaction to develop the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone. Researchers have Likert Scale estimation questionnaire as follows;

5 Extremely aware
4 Very aware
3 Moderately aware
2 Slightly aware
1 Not at all aware

IV. RESEARCH RESULT

6.1 The consequence of E-Portfolio's implementation as a mobile application, intends to provide storage for users to collect their portfolio via mobile phone. Users also can evaluate and access their collected information by using browser visit at (https://xd.adobe.com/view/ff1be67a-e08a-4562-866d-9b4613dbc3bf/).
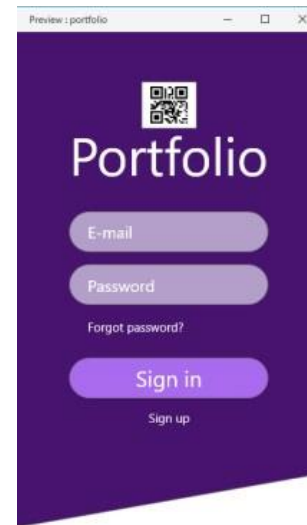

Figure 3. Index of the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone

For Index of the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone as following in figure 3, it displays a home page of "The prototype of E-Portfolio Application". Initially, User requires a registration by clicking "Sign-Up" to access the system for the first time.
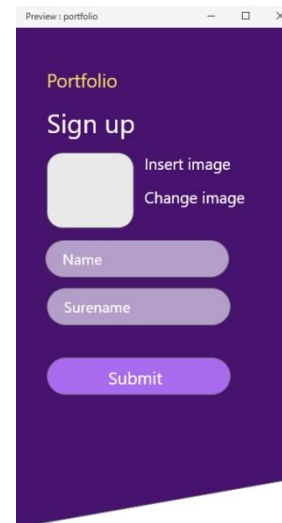

Figure 4. Register Page

For Sign up or Register as following in figure 4, it displays a register page of "The prototype of E-Portfolio Application". Registration requires photo, name, etc.
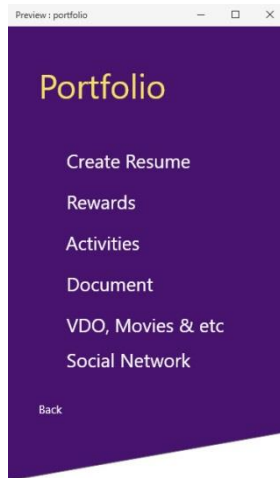
Figure 5. E-Portfolio Structure

For E-Portfolio Structure as following in figure 5, it displays its "E-Portfolio" contents consisting of create resume, rewards, activities, document, media (VDO, Movie & etc.), and social network.
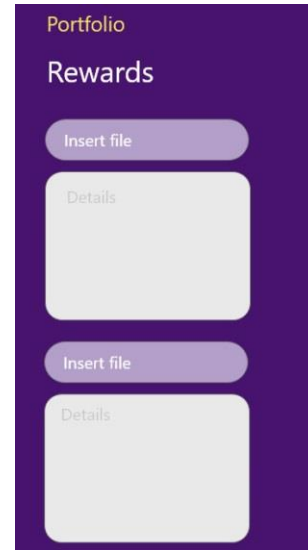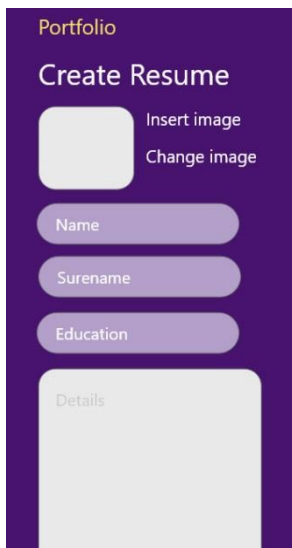

Figure 6. Create Resume

For Create Resume as following in figure 6, it displays "Create Resume Page" content. Users can insert/change their displayed photo including other information such as; Name, Surname, Academic Profile, and Contact.
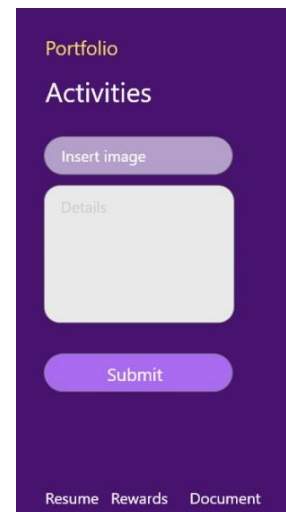

Figure 7. Rewards Page

For rewards page as following in figure 7, it displays **"Rewards Page" content**. Users can insert their earned rewards as a file with detail of each adding rewards.

Figure 8. Activities Page

For activities page as following in figure 8, it displays "Activities Page" content. Users can insert their activity's images with detail of each activity.

Figure 9. Document Page

For document page as following in figure 9, it displays "Document Page" content. Users can insert document files such as; copies of ID-Card, Census registration, Transcript Education and other documents.
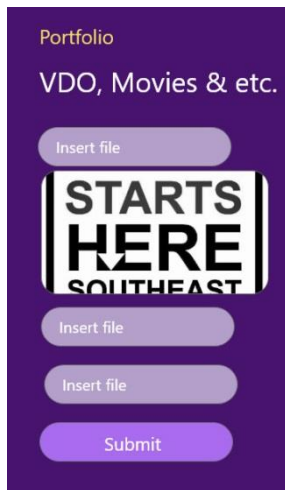

Figure 10. Media Page

For multimedia page as following in figure 10, it displays "Media Page" content. Users can collect their media files into "E-Portfolio" such as; Video Clips, Short Movies, Source Effect, Fonts and so on.

Figure 11. Users' E-Portfolio Detail Page

For User's the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone as following in figure 11, it displays the detail of user's E-Portfolio Application. This includes every contents of E-Portfolio structure consisting of personal and academic information, rewards, activities, document, and multimedia. Thus, users can always be carrying their portfolio to everywhere via smart phone.

6.2 The statistical research results are conducted over users' perceptions as average scores to be analyzed based on Best Theory as table I.

Table I. Evaluation's Classification

Score	Meaning
4.50 – 5.00	Extremely aware
3.50 – 4.49	Very aware
2.50 – 3.49	Moderately aware
1.50 – 2.49	Slightly aware
1.00 – 1.49	Not at all aware

The evaluation of the satisfaction to develop the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone, are showed below in table II

Table II. The evaluation of the satisfaction to develop the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone

Evaluation Items	$\bar{x}$	S.D.
"E-Portfolio" Contents		
Interesting techniques.	3.41	0.86
Simple understanding contents.	3.93	0.77
User Interface design. (Displayed Screen)	3.57	0.86
Defined contents inside E-Portfolio.	3.01	0.84
Contents detail. (Resume, Document, etc.)	3.53	0.53
Understanding about "E-Portfolio"		
E-Portfolio's usability.	3.60	0.49
Instant self-evaluation.	3.46	0.50
Conveniently and Simply Present "Portfolio".	4.59	0.63
Development is suitable for present lifestyle.	4.39	0.72
Intend to use "E-Portfolio" in future.	3.82	0.41
Total score of users' understanding	3.73	0.66

From table II. The evaluations of user's understanding about "E-Portfolio", result the total average at 3.73. Those of users' understanding are sorted by allocated scores in descending order for 5 places. The first place is "Conveniently and Simply Present Portfolio." which stands at 4.59. Secondly, "Development is suitable for present lifestyle." provides convenience for users to access their portfolio by using mobile phone connected to the internet, which contains the average of 4.39. Thirdly, "Simple understanding contents", stands at 3.93. Fourthly, "Intends to use E-Portfolio in future", stands at 3.82. Fifthly, "E-Portfolio's usability." on self-evaluation, specialization, etc., stands at 3.60.

VII. RESEARCH DISCUSSION

The research result of "the prototype of Electronics Portfolio (E-Portfolio) Application on Mobile Phone" can be concluded as follow. It shows that users understand the concept of "E-Portfolio Application", which provides electronics online storages for users to keep them in touch on their mobile phones. Therefore, the development of "E-Portfolio Application" can be implemented as a prototype for electronics portfolio application, making users can do self-evaluation and presentation instantly.

VIII. Recommendation

The development of "E-Portfolio Application" is connected to the internet. This is available for users and officers to access those portfolios via the internet as information system for organizations to manage in forms of text, image, or document. Also "E-Portfolio" can be applied into the university to evaluate personnel's performances according to organization policy for each position.

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