Application in the Future for Education

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บทคัดย่อ-เทคโนโลยีสารสนเทศก่อให้เกิดการปฏิรูปในองค์กรต่างๆ ด้วยการใช้เทคโนโลยีสื่อสาร อีเมล์ กรุ๊ปแวร์ หรือเครือข่ายสังคมออนไลน์ ซึ่งช่วยในการส่งข้อมูลข่าวสารของบุคคล นอกจากนี้รูปแบบการทำงานแบบ Virtual office ช่วยให้สามารถทำงานได้ไม่ว่าจะอยู่ ณ ที่ไหน เวลาใดก็ตามด้วยอุปกรณ์สื่อสาร โดยแนวโน้มการเปลี่ยนแปลงของสังคม ทำให้ส่งผลต่อการเปลี่ยนแปลงด้านการศึกษาให้กลายเป็นรูปแบบ Virtual เช่นกัน จากความต้องการของผู้บริโภคทำให้นักโปรแกรมเมอร์ได้มุ่งพัฒนาแอพพลิเคชันต่างๆ ออกมาอย่างมากมายเพื่อตอบสนองความต้องการเหล่านั้นบนอุปกรณ์พกพา โดยครอบคลุมหัวข้อต่อไปนี้ ที่มา ความหมายของแอพพลิเคชัน เทคโนโลยีการศึกษา แนวโน้มการพัฒนาแอพพลิเคชันด้านการศึกษาในอนาคต และสุดท้ายความสัมพันธ์ของแอพพลิเคชันกับผู้ใช้งาน เพื่อเป็นแนวทางสำหรับผู้พัฒนาแอพพลิเคชันให้บรรลุเป้าหมาย พัฒนาสื่อการสอนด้านการศึกษาของประเทศ และเหมาะสมตรงตามความต้องการของผู้ใช้งาน

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Abstract— Information Technology causes the reform the organization in which communication technologies such as email, groupware, and social networks help interacting among staffs. Furthermore, the virtual office platform enables working anywhere as well as the communication device can be connected. The increasing of mobile device usage results in changes in education to the virtual environment. From the consumer demands, the programmers have developed many applications on the mobile device to serve the needs. This paper presents the backgrounds, application terminologies, educational technologies, the trends in application development in the future, and the relationship between the application and the user. The discussion will be guiding the developer to achieve the objective on educational media and suitable for the targeted student.

Keywords-Application for education, Education in the future, Mobile Learning, Cloud technology

I. INTRODUCTION

The acceptance of technology of the people in the future has been changed from the past. With the rapid development of innovations, inventions, and applications which can be served in many types of the users. Providing that the connection and communication on earth, both government, and private organizations can use the application as a tool to operate on business such as public relations, advertisements, commercials, information exchanges, and connecting with the organization and the customer. In Thailand, the growth rate of application user on computer and communication devices such as smartphones and tablets has been increased. In the year 2016, 83 million devices are connected to the Internet, and 4.3 million devices are using 4G [1]. Since the application is the medium between the organization and the user, the developers have the factors that need to be considered to make the successful application. These factors are understanding the target, presentation, modern, serving the needs, and accurate presentation [2, 3, 4]. The future of everything relates to the accessibility of learning and the cooperation in education in national and international level. Learning and teaching build the social of learning. Cloud computing is one of the important systems in the education. The world of learning and teaching within an institution needs cloud computing technologies to support the connection among the devices in the system.

This research has the objectives on propagating knowledge and understanding in the future of application development in education on the Internet and helps the readers applying the knowledge on application development to improve the performance in the education of Thailand in the future.

II. APPLICATION TERMINOLOGIES

Many users are interested in and using the applications or apps nowadays. However, only a few of them understand the definitions. The application refers to a computer software developed by the programmer to respond to some operations for the user. The application development can be separated the usage on different

operating systems and devices. Some software can be used in many types of device. The applications that can be used in desktop and laptop are called desktop applications, and the applications that can be run in the portable devices are called mobile applications. Once the application is started, it will be running until it is closed. When multiple applications are used simultaneously on the operating system, we call this operation as multitasking.

III. EDUCATIONAL TECHNOLOGIES

Education technology contains two words. The first word is technology which refers to the science of how-to. However, this how-to does not only refer to the tools but also the materials. The education word refers to the tool and material applications, the approach to improve the efficiency of learning, and the environment settings for learning [5]. Educational technology refers to the science that applies much academic knowledge and arranges as the learning and teaching so that the learner can effectively and efficiently acquire the knowledge according to the learning objectives. The educational technologies can be grouped into three categories as follows.

A. Learning about technology

Learning about technology is a learning of working process on the computer. The result of learning is the ability to use a computer and develop an information system on the Internet.

B. Learning by technology

Learning by technology is a learning of new knowledge and practice some skills by using technology media such as computer-assisted instruction (CAI), and any interested topics via the Internet.

C. Learning with technology

Learning with technology is learning by using interactive communication and technical such as practicing the language with a program and practice with a simulation. Educational technology has four main objectives as follows.

- To improve the range of the learning resource. The learners have more opportunity from more range of source including teachers, materials, tools, methods, and locations.
- Emphasize on individual based learning. Educator and Psychology try to use individual based learning instead of teaching one-by-one method. Learning with a program will help the student to learn by self-pace from many machines or medias.
- Systematically analyze the educational system. The systematical analysis method in practice or

problem solving is the method of science that are problem provable or goal achievable. Because the process of a systematic method is reasonable, the analysis of components of the work or the system allows the components to have interactive and efficient working.

- Develop the tools and materials in education. Tools and materials in education need to be improved to have a capability in the learning process to support the future technology.

CAI on the network is one of the techniques that can be used in teaching and learning by using technology. The teaching and learning using web-based instruction (WBI) [6, 7] is the teaching that is learner based. The advantage of this method is the motivation of the learners, learning attractions, observing students' behavior, and individual-based. Besides, the student can access the resource at anytime from anywhere which improve the teacher capacity to carefully monitor the learners.

IV. TRENDS IN APPLICATION DEVELOPMENT IN THE FUTURE

From the survey in the year 2013, 7 billion mobile devices are running on the earth. In 2013, the smartphone and tablet usage of the students in the United States continuously increased by 103% [8]. Therefore, the use of mobile devices, computer, and interactive devices causes the increasing rate of application development. These devices heavily depend on cloud computing which is a very popular trend. The primary purpose is to reduce the investment in information technology which can be used in an organization, business, and individual level. Cloud computing also supports unified communication system in the education where the communication in every device is in real-time, and the communication information can be gathered in the same place as shown in Figure 1.
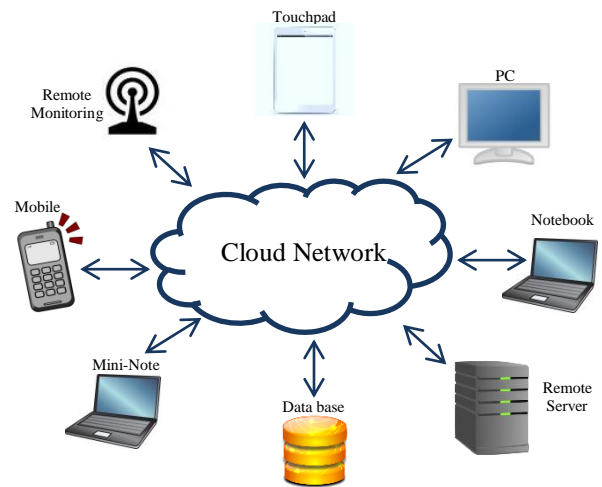

Figure 1. The prepare of cloud technology for the future of education

A. Application Design Standard

To make a complete application, the developer need to design the structure, plan the sequence of content data, and categorize the usage. The main purpose is to allow the user to visit the application systematically. The structure design is the most important process to make the successful application and convenient usage for the user.

The design standard was declared by international organizations that are related to system design. The design should follow the possible theory to make assurance in designer social. These standards are IEEE standard in hardware [9], ISO 9241 Ergonomic requirement for office work with visual display terminal in software [10], as shown in Table 1, which emphasizes on efficacy, efficiency, and satisfaction of the user by evaluating while the users use the system.

TABLE I.   INDICATOR OF USAGE IN ISO 9241 [2]

Usage objective	Measure in efficacy	Measure in efficiency	Measure in satisfaction
Work suitability	Percentage of successful goal	Time taken to complete the job	Ratio of satisfaction
Advanced user suitability	The number of used power properties	Efficiency between unskilled user and skilled user	Ratio of satisfaction with properties
Learnability	Percentage of learned functions	Time taken to complete learning	Ratio of learning convenient
Resistance to mistake	Percentage of mistakes that have been fixed	Time taken to fix the mistake	Ratio of mistake management

B. Educational Applications

There has been continuous development of learning media in education from using learning material, web-based instruction (WBI) [6, 7], web-based training (WBT) [6, 7], internet based training (IBT) [6, 7], net-based training (NBT) [6, 7], self-paced training (SPT) [6, 7], and mobile learning [6, 7]. The future of learning becomes learning social. The technology used in teaching and learning depends on cloud system to help learner and teacher to access anytime and anywhere. Cloud computing and mobile devices are the integrated technology that can manage everything in the school. As the result, learning and teaching have changed. Every resource and information are accessible from computers, smartphones, and tablets.

From the educational perspective, the programmer should develop the educational application on translation, dictionary, skill practicing, learning a language, learning science, and learning media. Classroom of the future is shaped differently. By tends will bring these technologies to used in the study. As follows.

- Augmented Reality (AR): Currently, access to AR technology for educational purposes is mostly limited to smartphone apps.
- 3D Printing: The 3D printer should really be a must-have in classrooms. Instead of being restricted to what they can play with, pupils in the classroom of the future can print out 3D models for various purposes, including show-and-tell.
- Cloud Computing: In the future classroom, students may just need an electronic device to access all their homework and all other learning resources in the Cloud. This means no more lugging heavy textbooks to school, and having constant access to your reading materials as long as you have an Internet connection.
- Online Social Networking: Furthermore, this many-to-many interactive learning where ideas are allowed to flow freely will be more aligned with real-world scenarios where collaboration is usually the norm. Social networking tools can be incorporated to enhance collaboration and team-building initiatives. Another benefit is that It also serves as a great feedback tool, to help improve the courseware. A social-based approach to education will seem more than relevant to students of the future.
- Flexible Displays: It's just be flexible OLED-based displays. This means we can roll them up into tubes or fold them like newspapers or Paper-Thin Smartphones.
- Biometrics (Eye Tracking): One technology that's been gaining recognition is biometrics. Conventionally biometrics are associated with the security industry, as it uses what is unique to each one of us to authenticate our identity: fingerprints, facial recognition, iris patterns, voice. In terms of education, some schools are only using fingerprinting to prevent truancy and for borrowing books from their school library.
- Multi-Touch LCD Screens: Over the past few decades, we've seen the transition from blackboar to whiteboard, to overhead projector and to video projector for computers in schools. Specifically speaking, the next "board" is likely to be a giant touchscreen LCD screen which allows a greater amount of interactivity. The major difference with this new "board" and our smart devices is that it will be capable of detecting multiple touch inputs from many students simultaneously.
- Game-Based Learning: One great way to achieve that is to use what had always been considered as a major distraction to learning – video games.

V. THE RELATIONSHIP BETWEEN THE APPLICATION AND THE USER

As the application development walks together with the new technology innovation, one of the development is application development on a mobile phone where the software is developed to respond to the need of the user, ease of use, convenient, responsive, accessibility, real-time usage which are suitable for a modern lifestyle. Besides, the development also complies with the policy of information technology and communication in Thailand B.E. 2554 – 2563 (ICT2020) in 6th strategy [11], which states that government should provide electronic service that is accessible and suitable for the daily life of citizens. Bringing Information Communication Technology (ICT) to support social service from the government, the citizens are more convenient to access the government services from the mobile internet device.

In Thailand, the Electronic Government Agency (EGA) [12], which is under the Information Communication Technology Ministry, is responsible for support and develop the application for the government. EGA also define the standard of mobile application development so that the development of the application for government departments will be in the same direction. The standard includes service property, user privacy, application programming interface, open data, testing property, rights and agreement to use the device and components, and security.

The trends of using technology will continuously increase especially in social online and social commerce. For education perspective, the application of mobile learning can be inserted in learning and teaching. Many institutions have been used social online as the media to communicate, make public relations, and apply for learning and teaching [13].

VI. CONCLUSION

The objectives of this research are to enable the reader to understand the viewpoints in the efficient application development and the trends of application usage in the future. This paper presented the background, application terminology, the critical of application technology in education, trends of educational application development in the future, the design standard of application development, the relationship between the application and the user. The reader can use the knowledge from this paper as a guide to modern application development. Furthermore, the knowledge can be used to evaluate and improve the application to target the users' needs. Finally, the study of the relationship between the application and the user will help to develop a more suitable application in the future.

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