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Digitized Educational System

Suppanunta Romprasert and Jirayut Monjagapate

Abstract

Today's society, economy, and community are involved in terms of information technology usage. Thai university is a national university that has been highly supported by the Thai government. The term "autonomous university" refers to being independently organized under "bureaucratic frameworks." In other words, being an autonomous university lets the university to re-engineer itself to stay up-to-date for current market demands for labor. Most universities are already autonomous universities, but the system and structures still remain inefficient. Papers are used for records. Thai university has not kept records in soft copies. It is difficult to re-engineer university system because, to implement a new structure, it incurs huge costs. To digitize the university system, technologies, training program, and expertise are required. Moreover, online education and mobile students seem to be far though technology has been fundamentally implemented. Thai university mostly offers traditional classes, which it requires the students to attend with all paper works for the entire period. Active learning that has always been mentioned by government has still not been completely applied. According to these reasons the authors would like to recommend digital instruments, a way to re-engineer university systems, and other factors to support better educational systems.

Keywords: digitization in public, management, organization, formal institution, digital governance

1. Introduction

Internet of Things (ToT) is a form of Internet connecting into physical devices and objects. Internet of Things is a combination of several technologies such as real-time analysis and machine learning. Everyone from everywhere in this world can connect to each other via the Internet. Interactions are mostly done from the World Wide Web. It is interesting that nowadays, the Internet can not only connect to the web but can also connect to smart card, security, online banking, health care, education, and so on.

In addition, the Internet of Things can generate chances for new services and sales, which can be more efficient for the business sector. For the government, according to economic growth factors, there are five main pillars for policy making: (1) hard infrastructure; (2) soft infrastructure; (3) service infrastructure; (4) digital economy; and (5) digital society and knowledge. The digital economy seems to be outstanding these days because the economic growth no longer depends on production and consumption or touchable goods; rather, it additionally depends on intangible goods.

The educational system in current economic and social conditions are forced to use as in the Age of "Information Technology". The growth rate is increasing in the area of knowledge because of the trend "lifelong learning," which the old style may not be able to support the creation of a career for a new generation anymore. Professionals must always adjust and be ready to learn. The industry must develop the skills of employees to be appropriate.

The learning style that is suitable for the information age is a model that can bring technology to use by learning appropriately with the interests and abilities of each individual. This resulting is called "New Learning Style (NLS)" such as massive open online courses (MOOCs) for the masses or other learning channels whether they are videos, audios, social media, or games. It shows a good opportunity for the new generations to choose a learning style that suits them the most.

Will this method be widely used in Thailand consistent with the behavior of Thai's new generation? There is a high chance that the new generation will be able to access it, including causing learning changes in the near future.

2. Digitized educational system

The knowledge that young generations need more is "working skills and life skills" in daily life, respectively, by means of additional knowledge using media such as videos, audios, social media, etc. with Internet connectivity. For the comments from young generations on using online media, it is recommended to have a variety of learning topics especially for the classroom in particular applied in various fields of subjects for instance, in Economics of Information Technology; it is a study of overall economics in the age of technology, structure of markets and information technologies, product and price differentiation method, costs associated with changing technologies, economies of scales, effects of network, product standards, the effects of linked product system, effects of development an transformation of technology toward the economic and industrial policies. In Creative Economy, students learn ideas of economic motivation on the fundamental of integrating between education, creativity and the use of intellectual property to link with culture and accumulated knowledge of sociology, technology and new inventions. In International Business Management, it is a study of basics theory of international business management, international merger and acquisition, opportunities for export and import, analyzing strategies and competitiveness of the international organizations, etc.

Digitized educational system can be used to present as creative media providing many pictures, but less content. To support on this issue, instructors should have knowledge of the subjects taught using an online media to make it more interesting and more accessible for students.

However, the major problems and obstacles in learning are related to attitude differences, individual tastes, and judgment of teachers and learners. These obstacles are a result of development of analytical thinking skills to promote learning via a combination of media-interactive learning such as social media videos, together with traditional media such as movies. Inspiration and diverse learning are main factors that can actually be a motivation to learn for the younger generation.

2.1 Digitized teaching and learning

When implementing each learning platform, using the media selection suitable for the needs and context of the end user should be considered. One approach

outstanding today is on preparing to benefit from the learning materials fully with examples of ideas to know "Massive Open Online Course (MOOCs)" [1]. To study MOOCs, learners should be provided with a mentor system, and MOOCs with industry sector practice must be implemented. With technological advances, coupled with economic and social dynamics, causing changes in all learning channels, technology is known as the key driver, whether it is artificial intelligence (AI) that causes significant changes in every platform or otherwise. Automatic chat program will be the other channel, which can be divided into the following main groups: gathering knowledge and exchanging knowledge between students with diverse knowledge and experiences.

Some part of the world, using the technology of games like AR VR to promote learning and in the same time using social media for the benefit of learning like technology and tools to help learning activities. Moreover, promoting the use of audio media creates equality in learning for all groups of people. It should encourage Thai people to know the source of Thai audio books for benefits.

2.2 Project writing and digital data evaluation

Not only the university but also every government institution, all public organizations, and private sectors must follow bureaucratic frameworks to do the paper work and follow the bureaucratic forms. When a project is coming out, every procedure of the project must be written and recorded as paper work. The importance of paper work is to serve as evidence and all papers should be coded and recorded in the book. This is to confirm that every step is seen by every department and checked many times.

For example, for a project proposal, first of all the budget of that activity will be planned before the year of budget (for public institutions that follow the bureaucratic frameworks, the year of budget will begin on October 1st, this year, and will end on September 30th, next year). The plan's details need to be discussed at the conference, so papers will be printed to distribute to every member at the conference. Next, when it is time to start the project, the project needs to draw on many topics such as declaration of intentions, costs, evaluation, and schedules. After the project has been approved, all the papers are collected and kept as evidence. When the project ends, an evaluation is required. The evaluation can be in a paper form or a writing form. The number of papers in this process depends on the number of participants. All processes that have been stated are made by papers.

Figure 1 illustrates the process of a project procedure; every step requires paper work. After the project ends, all papers are kept as physical evidence. No or few papers are scanned and transferred into a digital file. After that, all papers become
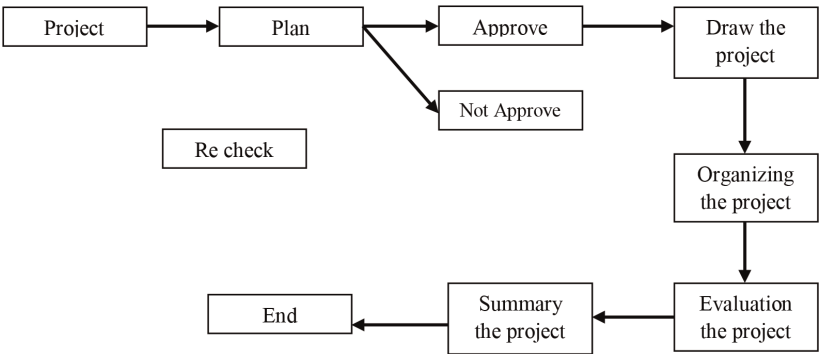

Figure 1.
Brief process of project procedure.

physical "dark data" or the information that we no longer use, but we cannot eliminate them completely because they will, sometimes, be used later. However, the amount of papers causes the problem of managing. Also, it becomes difficult to search the old papers. The importance of paperwork: In the bureaucratic system, it is important to keep papers because they can be used as evidence and references for other departments, private institutions, and citizens. The papers also can be used for legal protection. In addition to private sectors, some companies do not have sufficient space to keep all the papers, so they quickly adapt to the new technologies to change the forms from physical files to digital files.

However, there are problems of having paperwork. Because these papers can be used by many people in the organization, the papers can be lost or moved. Possibly, in terms of human capital, people lack the knowledge of managing papers. In the worst case, when the organization loses papers, it is hard to find them or recreate paperwork, and cost for recovery is incurred. Hence, it is important to transfer papers into digital forms to facilitate the organization. In governmental institutions, paperwork still exits, and some of the governmental institutions fully have paperwork or few digital files. It is a risk to have only paperwork.

The Faculty of Science, Srinakharinwirot University, Thailand, [2] announced that one faculty consumes 1700 ream or 850,000 pages annually. It costs about almost 200,000 baht per year 0r 6286 US dollars. If the amount of paper consumption reduces, the environment will be saved and the cost of operation inside the department can be minimized. **Figures 5** and **6** show the change in society in terms of technological approach and many organizations still have remained the same. To show the evidence, according to [3], overproduction of paper cause significantly to pollution, deforestation, and greenhouse gas emissions.

For the recommendation, we put the data of the projects and other information into the digital system, it will consequently reduce the cost of operation because data are transferred from physical to digital. Moreover, it makes channels of access of data better and easier, and it can reduce cost of transportation because data can be accessed everywhere. This would be beneficial to all government, business cooperation, and people in both macroeconomic and microeconomic perspectives [4]. **Figure 2** shows a cloud for education. Users can log in to their accounts and upload documents, and other users who are authorized can also download the information. *"Cloud is the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer."*

Moreover, if the data are transferred into the digital forms, it can be copied unlimitedly when we want to distribute. This can lead to *zero marginal cost*. The zero marginal cost refers to marginal cost of producing one additional unit that does not make any additional cost. The cost that we need to handle is the cost of the system [5].

2.3 Merged mail and digital worked assignment

The importance of the educational sector must be those who play an important role in learning management for "Quality of Learners (OL)". OL is to enable students to manage their own learning. There are push-factors to positively change
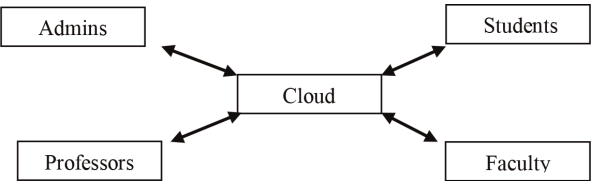
Figure 2.
Cloud for education.

the students. It may come from technological development, social changes, career changes. New generation children must have the ability to work [6, 7]—if there is a need for both advanced skills and critical thinking to support the future world.

For the proper educational system, students should be assigned homework properly. The assignment needs to be adapted to meet the needs and necessities of Thai society and the young generation, focusing on developing learners to be able to create innovation and create work together with personal skills [8]. Linking the order process with innovation is essential in every part of the educational system and that must be immediately and quickly changed together with the assignment through exchange of learning.

Developing a basic service platform of communication and providing the application can make more convenience and efficiency to all people in the system as follows: E-School or Electronic-School: Faculty of Technology used to improve public administration efficiency combining with increase transparency and reliability; and Smart School.

E-school has been developed to the point that at least two groups such as to support staff and to enable students to connect to work learning and teaching without adhering to the boundaries of duties and responsibilities in accordance with the mission of the faculty, but taking into account the benefits of the service provider as the location [9].

The goal is to deliver quality services to students in the form of "digital interaction" between departments such as Student2University (S2U); University2University (U2U); University2Student (U2S), and Student2Student (S2S).

An example for convenience is that students are allowed to complete their assignment anywhere as long as it is done before the due date. Students do not have to hand in their assignment in the professor's room. The file that they submit is an electronic file. This does not waste a natural resource like paper. In Section 2.2, the effects of using a large number of papers that could cause natural damages has already been demonstrated.

Figure 3 shows details of an assignment via Google Classroom (free), date of submission, and date of post by professor. This platform not only helps professors to check the date of online submission from students and but also helps to decrease paper work and wasted papers. Also, all data are recorded. Interestingly, the file that students submit can be checked and reviewed by other organizations such as https://www.turnitin.com/. The website can be a helpful assistant for professors for checking plagiarism. The website can check the information that has pdf, doc, and other electronic files. On the contrary, papers are difficult to recover when the paper is damaged or lose, and it is also difficult to adapt with other program or website.

In an academic field, plagiarism is considered as a serious crime. Almost all institutions set serious regulations against plagiarism. **Figure 4** demonstrates the similarity of the student's paper, as shown by the Turnitin website. In general academic rule, similarity must not exceed 20–30% for undergraduate students, 10–20% for graduate students, and 10% for PhD students. This rule depends on the faculty and the professors' consideration. It is, therefore, noticeable that merging new technologies helps teachers and learners in many aspects of academic files.
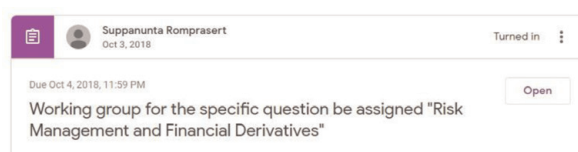

Figure 3.
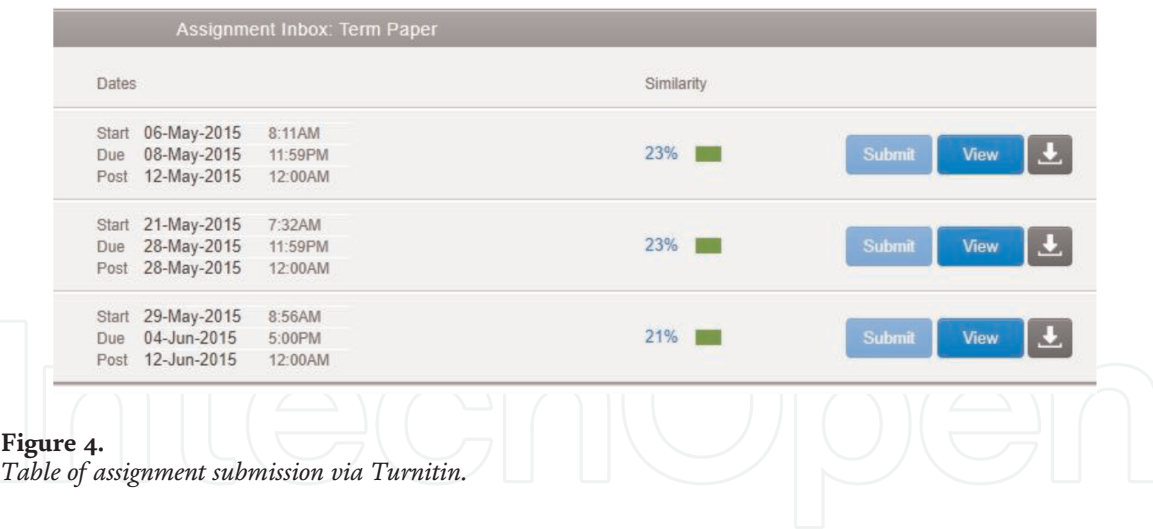*Online classroom & assignment via Google Classroom.*

Figure 4.
Table of assignment submission via Turnitin.

This does not benefit the education system only. The example intentionally aims to show how systematic the task allocation is. The platform of digital task allocation can be applied to all governmental institutions and private sectors to increase work efficiency and productivity. There is interesting statistical evidence why we should adopt a digital workplace. According to [10], approximately 64% of employees accept a lower wage if they are allowed to work away from office. Online social network generates more than 7% productivity to organizations. When the organizations use the social media tools, it increases 20% of employee satisfaction.

2.4 Digital combining for teaching systems

Many institutions adopt computer games as one channel of teaching; AR and VR technologies in games are used to promote learning. Teachers try to use social media for the benefit of learning unlike in the past and also use audio media creating equality in learning for all groups of students. Future classrooms should be brought up to speed to change educational system [11]. There are three significant aspects: The first is children; the environment around the children involves a lot of technology, which has both disadvantages and advantages; however, most disadvantages are causing children to become more hyperactive and autistic. The second is the use of smartphones all the time, adversely affecting their own health. The third aspect is the positive development of gadgets including the rapid emergence of features resulting in the behavior of people changing and making the classroom more attractive.

In recent times, the young generation thinks that having a classroom or learning from school is unnecessary. The young generation can learn via smartphone causing the question 'If we allow technology to play a role and learn too much classes or platforms, knowledge based on schools or universities, will be depleted and important. Earlier there would be awareness about the educational reform system, but focused on teacher development. No one could talk about the classroom, where the teachers were irreplaceable.

The teacher is like a warrior fighting to win, but he or she must make a good army commander, but we forgot to develop weapons for teachers—they are left with a weapon that is like the rusting spear to the warrior. When he or she does a career related to the design experience, there is a lot of knowledge about using modern technology media. The right discussion will meet good results. The variables normally use to comment be skills, experiences and knowledge which those should be used to make the classroom considered as "a weapon development for teachers" in the modern age.

In addition to this classroom set, there will be special characteristics that allow teachers and students to learn together. The technology available in the room will help spark creativity that can be lead to displaying creative ideas [12]. For example, the room has a laser projector projected in bright light with an image extension technology. Can those be connected to a creative environment for students to see the real thing? The actual size is better than sitting on the chair and reading only the textbook. To support the technology that will plug and support dimensionless classroom activities, teachers and students must hold hands and walk together. There are so many activities that the teachers can change the classroom and make it look like an exhibition, allowing students to work on their own experiences. The process of real work will help students to discover their identity and aptitude including the practicing skills to deal with tasks.

2.5 Teaching and learning with digital systems

High school and university are different. University students focus deeper in their interested fields than when they were high school. University's structures: Instructors or professors are responsible for the students in many ways. It is more than just coming to teach and check everything the students finish. The professors have to prepare lecture notes, research, do quality assurance of the course, draft and organize the university activities, be an advisor, and teach. That is why professors do not just only teach and do research as many people believe they should do.

Figure 5, [13], shows the percentage of population using the Internet for the period 2010–2016. In 2010, only 22% of Thai population accessed the Internet. Six years later, in 2016, the number of Thai population accessing the Internet is 47%, which is higher than the 45% of the world population. [14] **Figure 6** also goes in the same direction as **Figure 5** and shows the number of mobile cellular subscriptions
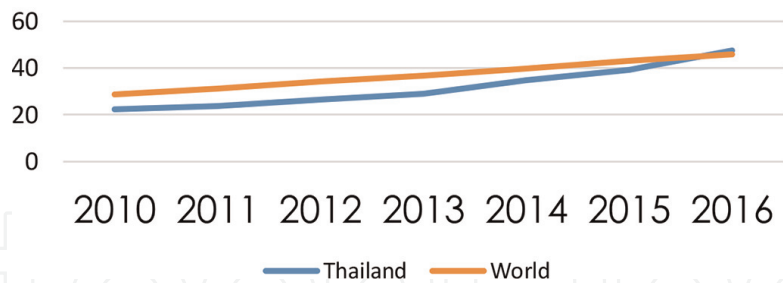

Figure 5.
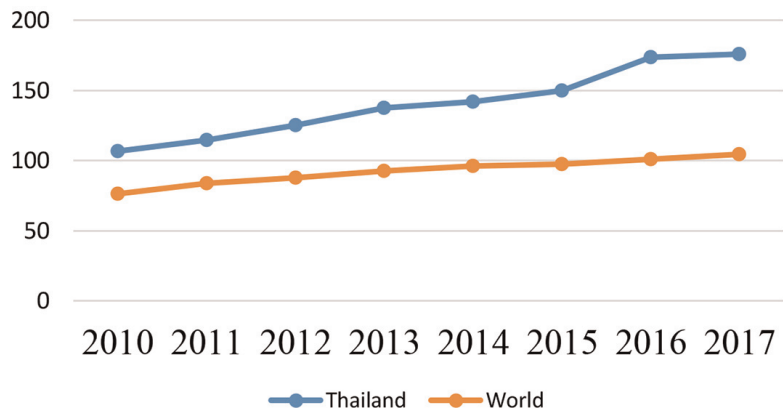*Individuals using the Internet (% of population).*

Figure 6.
Mobile cellular subscriptions (per 100 people).

that has been increasing. Especially, in Thailand, the number has long been raising beyond the world's average. In other words, 1 Thai person probably has more than 1 mobile phone.

It is interesting that Thailand has adapted to the Internet and smart phones faster than the rest of the world's average. From this statistical evidence, we can expect that Thailand would have probably transferred analogue system to the digital system. However, for the educational system, Thailand has just started to turn the education system into the digital system.

To illustrate the statement above, almost every Thai university is a national university, which has been highly supported by Thai government to become "*autonomous university.*" The term "autonomous university" refers to be an independent organization under the bureaucratic framework. In other words, being an autonomous university lets the university to re-engineer itself to be stay with the flow and up-to-date based on the current market demands, which are changing all the time and faster than before. However, online education and "mobile students" seem to be far from here though it should have been fundamentally implemented already. Thai universities have long offered traditional classes that students have to attend, and some courses still use paper works for the entire period of the course. Because of being autonomous universities, some universities have made their system stricter than before. The term "strict" means that every procedure and process inside the university must be recorded and printed out. Some procedures that should not be with the paper work still appear. The paper work actually takes time and effort. The paper work can cost a high opportunity cost relative to other work that the Thai professor should do. The opportunity cost means the loss of gain from other alternatives. For example, you spend 4 hours for the paper work, but you can exercise and read some good books for 4 hours.

Moreover, professors have various tasks in one day. As it has been stated before, Thai professors do not just teach and do research. In addition, every student must have a professor as an advisor for his entire student life. Professors must spare their time for other students who enroll to their course.

Figure 7 illustrates from the survey that university students make an appointment and request on meeting with professors face-to-face. The results from survey are interesting that every Thai university student chose face-to-face. However, for other ways to communicate with professors, we have new technologies to make easier communication such as Line Application and E-mail, but less than or equal half of the numbers of students use these applications.

When we compare the growth number of accessibility of Internet and mobiles with the way students contact their professors, the number of digital tools and digital services that students use for contacting their professors go in different directions. From previous illustrations, we can see some inefficiencies from not adapting new technologies. For example, in students' side, students do not much adopt the digital technology in the educational way, and it can convey to how

The Ways Thai University Students Contact their Professors							
Gender		Face-to-Face	Line Application	Email	Facebook	Personal Telephone	University Website
Male	Number	10	2	4	2	0	1
	Percentage	100%	20%	40%	20%	0%	10%
Female	Number	16	8	2	1	2	1
	Percentage	100%	50%	12.5%	6.25%	12.5%	6.35%
Total	Number	26	10	6	3	2	2
	Percentage	100%	38.5%	23.1%	11.5%	7.7%	7.7%

Figure 7.
The ways Thai university students contact their professors.

professional they are. For professors' point of view, it is difficult to manage their schedule because students come to ask for face-to-face appointments. Sometimes, professors can possibly get distracted when they are working in their room. Additionally, this can be a major problem for professors if the class they teach contains a large number of students.

This, therefore, comes to the recommendation that the university should promote and announce digital techniques to the class and add some regulations. This can reduce the difficulty of professors. Students also benefit from this such as knowing how to formally contact with professors, becoming more professional, and using a way to communicate while they are in the university to apply for the jobs. Some research points out that using digital goods and digital services assists better learning experience as the digital goods and services represent a medium for communication [15].

However, the table of survey can be conveyed beyond the university concerns. Educational institutions should fundamentally be a pusher to everyone to perceive and learn to use new technologies. Also, they should provide some skills to all learners. The learners are not limited to students only.

3. Conclusion

Thai education guidelines should be managed to solve problems appropriately and creatively. It will be able to proceed in many ways, especially integrating the content of digital learning in the context. Knowledge management in institutions has a variety of characteristics, depending on the context of the organization. Some institutions look to manage their knowledge when they are related to strategies or practices, so they focus on knowledge generation and knowledge storage. If it focuses on practice, we can apply the knowledge by integrating the factors involved in information technology conjunction with the importance of personnel in the institutions. Therefore, it is a form of knowledge management from the foundations by bringing ideas from different sources to adapt in the context of their own institutions.

Acknowledgements

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