



A Design of Online Examination System Model for the Radio Frequency Spurious Certification

Phisit Pungvora-asn

College of Digital Innovation and
Information Technology, Rangsit University,
Phatumthani, Thailand

Paniti Netinant *

College of Digital Innovation and
Information Technology, Rangsit University,
Phatumthani, Thailand

Abstract: The current study aims to advance existing technologies to develop an online examination system model for people who want to get the radio frequency spurious certification; examinees can take the radio frequency spurious examination on the internet anywhere and anytime. The proposed model could facilitate staff and exam candidates, including the cost reduction. This paper shows how to apply an online examination system model to improve the traditional examination model. To develop the model, agile methodology is used by demonstrating a prototype model. The online examination system model is developed using Adobe XD. At first, a literature review is conducted to gather data regarding existing models, and later a prototype model is designed and developed using Adobe XD. This model could improve the examination processes, reduce all costs and times of examinees and The National Broadcasting and Telecommunications Commission (NBTC), and bring the advantages of currently available technologies to make it efficient, convenient, and effective. This system can support the examination of a radio frequency spurious certification by the office of NBTC. It shows that our online examination system model is efficient, reliable, and sufficient to use and replace in the traditional radio frequency spurious exam. The system responses to the needs of NBTC processes, employees, and examinee candidates as well.

Keywords: *Online examination system model, system model, software development, software prototype, adobe XD*

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I. INTRODUCTION

Nowadays, information technology is very far away. The information technology has come into existence, and the use of information technology education began to play a role in teaching more and more. The use of information technology applies to the education area. It can help to increase the opportunity to teach the other way effectively. The online examination system is one of the systems that can be applied to information technology to measure education proficiency. In the future, developers see the opportunity and the importance of the use of online examination system, so the idea of developing the online examination system design over the internet. The Office of The NBTC uses existing technology to develop online tests on the internet for employees and examiners.

The online exam system could improve the traditional exam process. The problem in the traditional exam system is conducted by the use of staff in the examination. It makes waste of personnel and allowances, staff costs, paper costs, and placement costs. Also, it makes the burden of examiners traveling to the place determined by the office. Examiners have to pay all expenses by themselves. Developers have identified the problem above, so it is prudent to develop online examination systems over the Internet. It could facilitate staff and exam candidates including the cost reduction.

This design online examination system model can create exams efficiently and can also set conditions such as the examiner must be trained in accordance with the rules of the office. The examiner has to take training

*Correspondence concerning this article should be addressed to Paniti Netinant, College of Digital Innovation and Information Technology, Rangsit University, Phatumthani, Thailand. E-mail: phisit.p@nbt.go.th

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courses specified the right to take the exam. The time to complete the exam will be fair when the time runs out. This design online examination system model is developed using Adobe XD, to demonstrate the system model of the system administrator and system users.

Online Examination of Online Test System via the Internet can be used to improve the traditional examination procedure. The system can support the processes and procedures of the office. It is efficient enough to be used in the actual test, responding to the needs of employees and exam candidates as well.

II. RELATED WORK

[1] Applying information technology to handle online examination to facilitate the faculty and students of Siam University. By the original examination format, the student will mark the correct answer on the answer sheet paper. When the student finished their exam, faculty will send answer paper to the academic department. Faculty of academic department will check the exam by using the Optical Mark Reader (OMR). The markers with this light will have many errors, such as when the student mark the correct answer is not filled, the wrong type of pencil, or mark too many answers in one question paper. With all this problem OMR can't prove the right answer. So the developer has developed ideas of Online Examination Management System. This is to increase the comfort for faculty and students also develop the problem of the original system. In the exam area, the teacher can be divided into a series of exams and determine the exam as required by the teacher.

[2] The Development of Examination System via the Internet of Rajamangala University of Technology Lanna, Chiang Rai Province. The researcher analyzes the original system using question and study method. In general, there are three related departments the registration department and the faculty and students. The problem with the registration department is that the exams are not stored in the nature of the exam library and are stored for a specified period of time. Then it was destroyed. The instructor did not analyze the test before using it because it was complicated and time-consuming. Students can't find the old test paper of each subject to be tested before the final examination. From the above problem of the old system, it was found that there are two major users of the system are teachers and students. The researcher then processed the user's needs from the information received from many faculty and students. You find that the instructor needs a tool to store the test paper and analyze the test to reduce the hassle of the test. This test can be made available easily and can be managed manually through the internet

and show the results of the exam immediately. Students need to take the test before the actual test on the university system and know the results immediately after the exam.

[3] College of Industrial Technology and Management (RMUTSV). There are problems in taking out difficult exams and collecting papers. The original examination will mark answer in the answer paper, which will use the examination machine to check the answer paper, or handle by faculty to check the answer paper, error calculation, and absence of test systems stored as a database system. This online examination system will solve the problems of the current examination. It will be able to handle examination via computer and internet networks to facilitate the faculty and students, and the system will improve the efficiency of examination preparation and storage of personnel. It's easy to take exams and online exams, making exams more efficient and quick and accurate. It also reduces paper usage because it does not need to print out the test papers and the examiner can also view the results via the internet.

[4] have said that the research approach to Information Technology Acceptance (TAM) is a research study of human behavior. To describe the method and rationale for adopting new information technology [1] to develop a theory that predicts the behavior of individuals or organizations in accepting the use of information systems [2] to lead to explanations and forecasts. Accept the use of information technology. [3] Understand the influence of various factors that help and accelerate the adoption and use of information technology in each organization or individual [4] demonstrated the justification of information technology investment in the future [5] approach to such research is the study of the various theories concerning the dissemination and adoption of innovation is fundamental.

Interaction between humans and technology is influenced by several social and psychological factors and characteristics [5, 6]. Because of the complexities involved in predicting human behaviour, research has generated a variety of theories and models to explain patterns of adoption and use of new technologies. Technology acceptance research is a mature field and has now been active for two decades as technology has invaded every domain of life. Several theoretical models have been developed to explain the acceptance behaviour of end users. Therefore, the study of technological innovation acceptance requires psychological models and theories to explain and rationalize whether users benefit from new devices. Several technology acceptance models have been developed, and they have their own specific characteristics which are reviewed below. The models have been

ordered in chronological order [7].

III. OUR APPROACH

Our method of conducting research is to develop a model using and Agile methodology by demonstrating a

prototype model. Our research can be divided into four main processes as shown in Fig. 1 as the follows

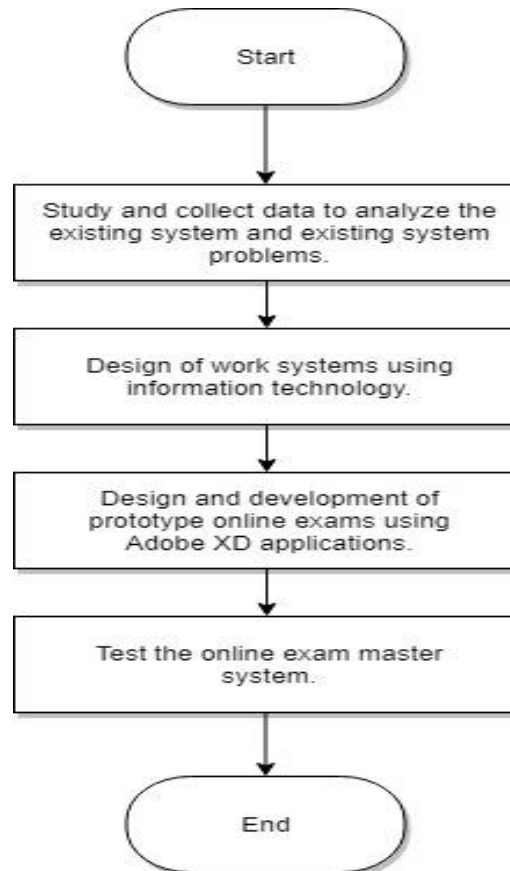


Fig. 1. IFD for design of online examination system models

A. Study and Collect Data to Analyze the Existing System and Existing System Problems

Initially, the researcher analyzed the existing exam system and the problems found in the original exam. In the traditional examination system, the candidates must pass the training as specified by the NBTC and the staff will record information of participants in the closed database systems. Then, they will inform the eligible person to take the examination on the website of the office (NBTC) and an e-mail of examiners which date and place to take the exams. The problem is both the staffs and the examiners. Each examination uses a large number of personals to manage and budget for each exam and a lot of times, for example, the allowance, document fees, and location rental for each exam. Including public relations, some incidences can occur making the examiners missing the announce information. The examiner

has spent time traveling, including travel expenses, and some examiner candidates came from different cities may have to stay overnight. The idea of creating an online test system on the internet is to facilitate the staff and the examiners. The online test can be taken anywhere at any time, and it is possible to check the status of the exam candidates easily, including reducing the cost and burden of each exam.

B. Design of Work Systems Using Information Technology

The new exam system will use information technology to manage. Based on the above information, our research was aware of the problems as mentioned before; we have developed the online test system model on the internet. There are two groups of users, administrators, and test takers, as shown in Fig. 2.

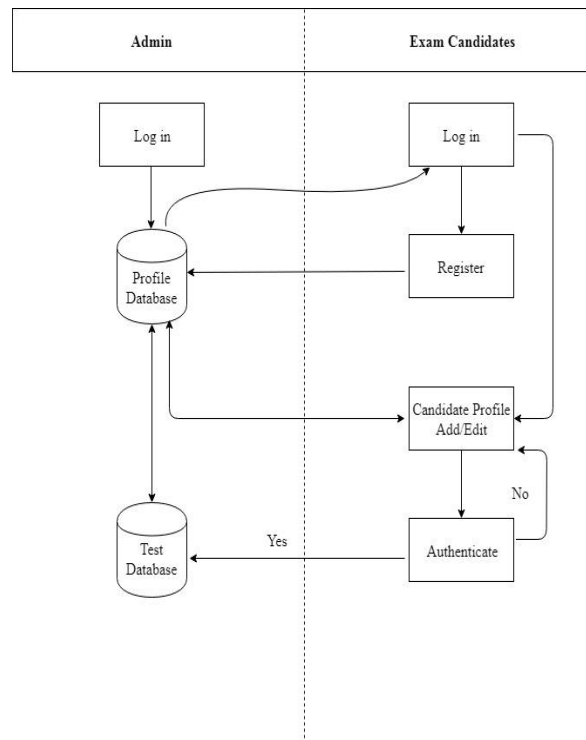


Fig. 2. DFD for design of online examination system models

The design of online examination system models on the internet can be divided into two groups as follows.

1. Administrators can split processes and processes as follows.

1.1. Administrators can manage user information, system management. The administrator can check the status of the user also could determine the eligibility of candidates and can modify information of candidates.

1.2. With this system, administrators can create exams by creating, editing, storing, and deleting each examination questions.

1.3. Examination administrators will notify examiners of the eligibility for each examination through the system, whether the examiner has attended the required course or not. After obtaining the right to take the exam, the examiners can take the examination at the scheduled time. At the end of each examination, the system will cut the examination immediately. Examiner passing the exam will be notified on the system to do the further processing. Candidates will not be able to take the exam right away. Candidates have to wait for the examination result. Administrators will continue to report results on the system.

2. The examiners have the process as follows.

2.1. The registration of the test takers is conducted through the system. After completing the registration process, the examiner can add and edit information on the candidate's profile, but can't delete the information

and the history.

2.2. Examination eligibility those who are eligible to take the exam must be trained in advance so that they can take the exam each time.

2.3. The exam will be divided into two parts and the system will randomly test the exam. The exam must be completed by the time specified.

C. Design and Development of Prototype Online Exams using Adobe XD Applications

This is how the system looks like. Firstly, the researcher will show the admin platform in Fig. 3-12 and then for the examiner's platform in Fig. 13-23.



Fig. 3. Log in page

Fig. 4. Forget password

ID Card No.	Name	Status / Dept.	Action
000000000000	Mr. A Ab	Trained / Pass Exam ABC Company	[Edit] [Remove]
111111111111	Mr. B Ba	Trained / Pending	[Edit] [Remove]
222222222222	Mr. C Ca	Have not trained / Pending HI Company	[Edit] [Remove]
333333333333	Mr. D Da	Trained / Pass Exam	[Edit] [Remove]

Fig. 8. Manage examiners info

Fig. 5. Admin page layout

Course Code	Course Title	Training Date	Training Place
NBFC00101	Training course of standard transmitter for broadcasting	2016 Jan 25	Karna Center Hotel
NBFC00201	Training course of measurement for radio frequency spectrum for radio broadcasting (Theory)	2017 Jan 10	Sri-Hotel
NBFC00301	Training course of measurement for radio frequency spectrum for radio broadcasting (Practical)	2017 Mar 4	Pulutan Hotel

Fig. 9. Examiner detail

In Fig. 8 and 9, admin can manage examiners user by add edit and remove user and update the status. Admin can check the user status such as personal user profile and status of training course.

Fig. 6. Adding Information

Fig. 5 and 6 show an admin page and admin can modify their personal information.

Fig. 10. To manage/create question paper into 2 sections

Course Code	Course Title	Course Must Pass	Compulsory Course
NBFC00101	Training course of standard transmitter for broadcasting		Yes
NBFC00201	Training course of measurement for radio frequency spectrum for radio broadcasting (Theory)	NBFC00101	No
NBFC00301	Training course of measurement for radio frequency spectrum for radio broadcasting (Practical)	NBFC00101, NBFC00201	Yes
NBFC_W5101	Understand before operation for radio broadcasting		No

Fig. 7. Manage training courses

In Fig. 7, admin can manage training course by add edit and remove course also can set the condition for the necessary course.

Fig. 11. Section A



Fig. 12. Section B

In Fig. 10-12, admin can manage online examination by add edit and remove question paper, and can create into two sections.



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Fig. 13. Log in page



Fig. 14. Register before use

In Fig. 13, examiners must register before logging in after created user examiners can be logged in through the system.



Fig. 15. Page layout



Fig. 16. Adding information

Fig. 15 and 16, show an examiners page and examiner can modify their personal information.



Fig. 17. Detail of trained

In Fig. 17, examiners can look up there history training information.



Fig. 18. Checking status



Fig. 19. Checking status

In Fig. 18 and 19, examiners will check their authentication of having the right to take the examination.



Fig. 20. Ready take a test

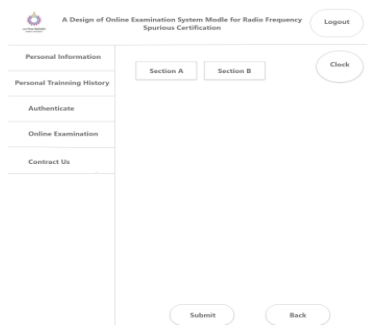


Fig. 21. Take a test

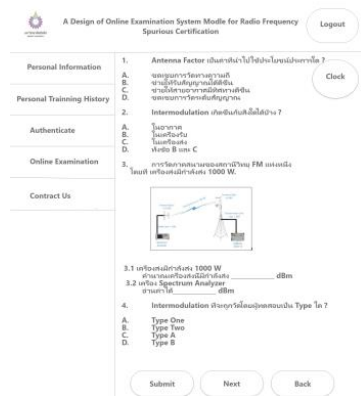


Fig. 22. Sample exam



Fig. 23. Sample exam

Fig. 20-23 show that after examiners have checked and authenticated and have a right to take the exam, then the examiners could take an examination. The examination will separate into 2 section examiners will have only 1 and a half hour to finish the exam.

D. Test the Online Exam Master System

The experimental system, the researcher created the design online examination system. The experiment was conducted for three admin and 20 for examiners the total of 23 participants, to show how the system looks like and how to take the examination. Then evaluate the user satisfaction. The overall picture is very good.

IV. SUMMARY OF EXPERIMENTAL AND SYSTEM PERFORMANCE

The researcher used the Technology Acceptance Model (TAM). [8, 9, 10, 11] as shown in Fig. 24.

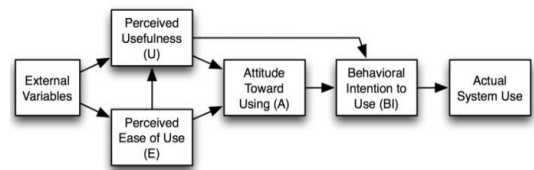


Fig. 24. [8, 9, 12]

From the above picture is the theory of technology acceptance model perception of technology. Convenient to use, and useful results in the use of technology. Such recognition and acceptance have direct consequences for system viewers and system users. If there is understanding, the benefits will be obtained and compared with existing systems. Users of the system will have the right to choose and decide to use it.

The results of the online sample examination system were used, and the satisfaction survey model was used as well as the convenience of using the system. The users are satisfied with the online exam system to enhance their convenience. Accuracy of inspection and cost reduction and the online examination system is very responsive to the exam candidates.

V. CONCLUSION AND RECOMMENDATIONS

Our system design of online examination system model over the internet can facilitate the staffs and exam candidates. The use of current information technology assists manages and gets rid of the problems of the traditional examination. In this paper, we have demonstrated and developed an online examination system model using the Abode XD application to recognize the underlying structure of the prototype system for employees and examiners. We have shown how to solve the problem of the traditional exam by adopting an Agile methodology, and we can ensure that the online examination model can reduce the burden on both employees and examiners. Our research will use a TAM to measure technology satisfaction and understanding. To allow employees and examiners to study and accept our system model, the technology accept model could prove that our system can replace the traditional examination. Overall, the staffs and candidates are highly satisfied and happy to have such a system. The system is easy to use and ready to take online exams in the future. Our research can conclude that our online examination system model can be used to implement and improve the traditional examination procedures and processes. The system can support the office. It is efficient enough to be used in the actual examination, and respond to the needs of employees and exam candidates as well.

Declaration of Conflicting Interests

Authors hereby declare that this work possess no conflicts of interests.

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