



User Interface Design of Web Application for Investment Consultant Exam Simulation

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Abstract

Investment Consultant (IC) refers to the license exam for an investment advisor. This is the first level of their career path. An exam simulation can be assisted a candidate to prepare for the license examination. Thus, the objectives of this research are to compare the results of the design of the user interface and test the effectiveness of the web application and the user's acceptance of the design. An online questionnaire will be used twice separately via Google Form by a test run of the simulation application. The results of both surveys are then analyzed with descriptive statistics such as percentage, mean, and standard deviation. The first survey results show that the paragraph spacing is appropriate on each web page as the highest with a mean of 4.29. The overall satisfaction of the web application from the first survey is a mean of 3.99. After that, the simulation web application is adjusted following the first survey results and is explored in the second survey. The second survey results display that the appropriate website footer has the highest mean with a mean of 4.19, more than the first survey. Furthermore, the overall satisfaction with the web application is higher than in the first survey, the mean of the second survey is with a mean of 4.04. Therefore, the pattern of user interface design for web applications of IC exam simulation should be easy in terms of font, size, paragraph spacing, and pictures. In addition, the exam lesson and the exam results should have clearly displayed the contents.

Keywords: User interface, Web application, Simulation, Investment consultant, Front-end design

1. Introduction

Within a decade, finance and investment industries have grown and continuously interested people in Thailand. Thus, there are several occupations that deal with funds and money, such as investment banking analyst, management consultant, and quantitative analyst. One of the most popular is an Investment Consultant (IC); it is crucial to developing the Thai Capital market. IC is intermediary personnel to provide investment information and investment advice for an investor. They can help in decision-making about investments for creating wealth and stability in life. Therefore, this occupation needs to pass an Investment Consultant Single License (IC Single License); it is a permit for the Investment Consultant or Broker. IC Single License is composed of four levels General Investment Consultant (IC plain), Investment Consultant of Complex Instruments Type 3 (IC complex 3), Investment Consultant of Complex Instruments Type 2 (IC complex 2), Investment Consultant of Complex Instruments Type 1 (IC complex 1). The first level is IC plain, which refers to advice on non-complex financial product types, such as equities, mutual funds, and uncomplicated bonds. The second level is IC complex 3, which relates to consulting equities, mutual funds, uncomplicated bonds, and derivatives. The third level is IC complex 2, which applies to equities, mutual funds, uncomplicated bonds, complex mutual funds, and bonds. Finally, the last level is IC complex 1, which relates to consulting equities, mutual funds, uncomplicated bonds, complex mutual funds and bonds, and derivatives.

Generally, there are preparing courses for professional license exams by learning materials via websites or online learning, such as Certified Public Accountant (CPA) and Chartered Financial Analyst (CFP) (Susan, 2006; Joseph, et al., 2011; Wai, et al., 2006). Unfortunately, the simulation of the pre-licensing exam is still inappropriate for an examinee. Since the license exam preparation, such as the IC Plain qualification exam, cannot support the examinees in Thailand. Therefore, developing a simulation system for the IC Plain qualification exam is essential, including financial and investment knowledge. Self-



online learning is an option to assist the examinees for the IC Plain qualification exam and knowledge revision.

Most online learning systems are developed using Content Management System (CMS) or Learning Management System (LMS) (Geri, 2014; Aini, 2019). In some cases, these systems may not be user-friendly completely. For example, the iLearning Media system is implemented by WordPress providing learning activities for each student. However, the system lacks attractiveness for learning from students. Moreover, some learning systems embed several videos into the system, students cannot focus on these videos (Sergeev, et al., 2021). Therefore, an online learning system is designed based on user requirements from a target group, which might assist a learner in the learning process (Meltem and Murat, 2013; Patcharaporn, et al., 2021; Rykanova, 2015; Pitisan and Thipaya, 2018; Ruchira, 2016).

As mentioned above, the objective of this research is to compare the results of the design of the user interface and test the effectiveness of the web application for the Investment Consultant exam simulation and the user's acceptance of the design. The web application learning is designed to be easy to use and provide the exam for all categories: fundamental knowledge, ethics, rules and suitability, and investment products. In addition, this web application learning can be assisted to prepare and increase the confidence for the examinees taking the exam.

2. Objectives

This research aims to compare the results of the design of the user interface and test the effectiveness of the web application and the user's acceptance of the design.

3. Materials and Methods

3.1 Materials

The research uses the Index of Item Objective Congruence (IOC) for a qualified questionnaire assessment by three specialists in investment and web application. Google Forms is used to survey the satisfaction of the user for the Investment Consultant (IC) exam web application prototype with 97 samples in Thailand. This research is analyzed by quantitative data. Thus, User Acceptability Testing must be done to evaluate the effectiveness of the design using percentage, mean, and standard deviation (SD). Moreover, the User Interface (UI) is designed by Adobe Photoshop CS6 version 13. In addition, the web application prototype is developed using Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), Bootstrap version 5.0, and JavaScript.

3.2 Methods

- 3.2.1 The first step of this research is to study users' User Interface (UI) requirements for the Investment Consultant (IC) exam simulation web application prototype.
- 3.2.2 The second step is to design a questionnaire of the UI for the IC exam simulation web application prototype via the Index of Item Objective Congruence (IOC) evaluation from three specialists in investment and web application. The questionnaire is improved follow by suggestions from three specialists.
- 3.2.3 The third step is to apply the questionnaire to survey the target group. Then, the result will be analyzed with quantitative data such as percentage, mean, and standard deviation (SD).
- 3.2.4 The fourth step is to adjust the web application prototype from the results of the first survey. Then, the altered prototype is surveyed as the second survey.
- 3.2.5 In The fifth step the results of the second survey are analyzed with percentage, mean, and standard deviation (SD). The results of the first and the second survey are compared to the satisfaction of the user and different web applications using statistical tests.
- 3.2.6 The final step is to design the prototype of the IC exam web application from statistical results.



4. Results and Discussion

4.1 Results

This experiment separates two explorations after the designed simulation web application. These surveys use an online questionnaire via the Google Form with 97 samples in Thailand. The questionnaire was divided into five parts: (1) general data, (2) user interface assessment, (3) display suitability, (4) web application satisfaction, and (5) overall satisfaction. The duration of data collection is two months. After the data collection period, 97 questionnaires were analyzed using descriptive statistics such as percentage, mean, and standard deviation (SD).

Based on 97 questionnaires, the participants from the first survey are separate as 78.6% female and 21.4% male. The second survey is separate as 79.4% female and 20.6% male. The highest response group of the two explorations is the age between 21 and 30 years old which is 45.9%.

Table 1 displays the comparison of satisfaction assessment from the user interface design of the IC exam simulation web application. In the first survey, the first part is the evaluation of the web application's home page. The highest average of the first part is that the pictures and contents are consistent with a mean of 3.95 and SD of 0.85. On the other hand, the lowest the average is the beautiful web application with a mean of 3.73 and SD of 0.84. In the second part, the exam archive page is evaluated in two points: the web pages' layout and the font size's comfortable read. The results show that the font size's relaxing read is the highest average with a mean of 4.21 and SD of 0.75. The third part is evaluating the test page; this is the same points of the assessment. However, the highest average is that the paragraph spacing is appropriate on each web page with a mean of 4.29 and SD of 0.79. This result has different from the second part. Then, the display screen organization is used to assess the suitability of display results from the exam archive screen and the lesson screen. The highest average is the display sequence of the exam archive screen with a mean of 4.08 and SD of 0.80. Therefore, the overall satisfaction of the website is with a mean of 3.99 and an SD of 0.85.

Table 1 The comparison of satisfaction assessment of user interface design of the IC exam simulation web application.

User interface evaluation	Survey			
	1 st		2 nd	
	Mean	SD	Mean	SD
1. The home page of the website				
1.1 The font size is comfortable to read.	3.90	0.84	3.98	0.74
1.2 The arrangement of elements is appropriate and beautiful.	3.73	0.84	3.95	0.78
1.3 The pictures and contents are clearly consistent.	3.95	0.85	4.18	0.71
1.4 The website footer is appropriate and beautiful.	3.81	0.94	4.19	0.62
2. The exam archive page				
2.1 The paragraph spacing is appropriate on each web page.	4.15	0.81	3.88	0.79
2.2 The font size is comfortable to read.	4.21	0.75	3.77	0.82
3. The test page				
3.1 The paragraph spacing is appropriate on each web page.	4.29	0.79	4.20	0.73
3.2 The font size is comfortable to read.	4.28	0.80	4.02	0.83
Suitability of display organization				
1. Display sequence of the exam archive screen is appropriate.	4.08	0.80	4.12	0.70
2. Display sequence of the lesson screen is appropriate.	3.91	0.88	4.07	0.77
Overall satisfaction with the website	3.99	0.85	4.04	0.75

After the first survey, the researcher brings the results to improve the user interface design of the web application. Then, the adjusted user interface design is applied to the second exploration for the satisfaction of this website. From Table 1, there is an increase in the average from every issue of the first part, such as the font size, the arrangement of elements, the pictures and contents, and the footer, including

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the issue of suitability of display organization. Thus, the home page of the website is improved displayed in Figure 1.

Since the exam archive page and the test page have decreased the satisfaction, the participants comment on the paragraph spacing and the font size. Therefore, there are improvements to the website, as presented in Figure 2 and Figure 3. However, the overall satisfaction of the second exploration has an average improvement with a mean of 4.04 and SD of 0.75.



(a) The first design



(b) The second design

Figure 1 The comparison of satisfaction assessment in the IC exam simulation web application in user interface evaluation of the home page of the website



(a) The first design



(b) The second design

Figure 2 The comparison of satisfaction assessment in the IC exam simulation web application in the user interface section of the exam archive page



4.2 Discussion

The IC exam simulation web application is a simulation system to provide investment consultant examinations for the career path of an investment advisor. This simulation web application has the structure to support an environment like an onsite exam. This simulation web application will be implemented and uploaded on the server of this research. Users can use this application via the Universal Resource Locator (URL) address of the web application. In addition, this application will prepare the environment for the exam that is similar to the actual exam, such as the amount of the exam or time of the exam. These components of the simulation web application are designed according to user requirements with the online questionnaire survey from the target group.



(a) The first design

(b) The second design

Figure 3 The first survey and the second survey of satisfaction assessment in the IC exam simulation web application in the user interface section of the test page

In Thailand, an exam simulation web application has been designed and developed using Content Management System (CMS) such as WordPress, or Drupal. However, these programs can assist to design and develop web applications rapidly, they cannot design user requirements. Table 2 displays the comparison results of the satisfaction survey using descriptive statistics such as mean, and standard deviation. In addition, simulation web applications that use CMS for user interface design and development have an average satisfaction score lower than applications designed to user requirements.

Table 2 The comparison of an exam simulation web application

References	Tools	Types of Web applications	Average and SD
Huang, C., Lin, C., & Chiang, Y. (2010)	Drupal	Blended Learning into a Chinese Language Classroom	Mean = 3.15, SD = 0.66
Uchegbu, C., & Ijeoma, M. (2019)	WordPress	Teaching of Architecture in South-East Nigeria	Mean = 3.77, SD = 1.06
Ketmuang, Y. (2011)	Moodle	Engineers Exam Review System	Mean = 3.65, SD = 0.54
Paparpit, I. (2012)	Learning Management System (LMS)	Referendum online lesson for communication arts students	Mean = 3.68, SD = 0.48
Luo, T., Murray, A. & Crompton, H. (2017)	K-12 Learning	Authentication Learning	Mean = 3.78, SD = 0.67
Natasa, H.B., Vedran, M. & Ivica, B. (2009)	Learning Management System (LMS)	Teaching Methods in Information Science	Mean = 3.40, SD = 0.63

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References	Tools	Types of Web applications	Average and SD
The proposed web application	Adobe Photoshop CS6 version 13, HTML, CSS, Bootstrap version 5.0, JavaScript	IC exam simulation web application	Mean = 4.04, SD = 0.75

Results in Table 2 show the tools, types of the web application, and mean and SD of other research from various types of simulation web applications. This research uses three tools, Adobe Photoshop CS6 version 13, HTML, CSS, Bootstrap version 5.0, and JavaScript for user interface design and simulation web application development.

5. Conclusion

The objective of this research aims to compare the results of the design of the user interface with the effectiveness of the web application and the user's acceptance of the design of a User Interface (UI) prototype for the Investment Consultant (IC) exam simulation web application. The application designs are separated into two surveys: the first survey is the user interface design of the web application, and the satisfaction survey from the designed web application using an online questionnaire via Google Form. The second survey brings the first phase results to adjust the user interface prototype. Then, the adaptable web application is used to survey satisfaction again.

The user interface design of this simulation web application uses Adobe Photoshop CS6 version 13. This web application has developed a prototype using Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), Bootstrap version 5.0, and JavaScript. In addition, the overall satisfaction of the web application of the first survey was with a mean of 3.99 and a standard deviation of 0.85. The second survey has the overall satisfaction of the web application was with a mean of 4.04 and a standard deviation of 0.75. The simulation web application specification consists of contents, lessons, exams, and font size appropriately. Contents and lessons will be prepared for learning and review lessons before the exam. The exams will show scores from the test exam and limitations of exam time like the actual exam. Furthermore, users can take the exam multiple times and compare scores between the previous exam and the last exam. The access of target has a sequence of each content, lesson, and exam appropriately. Therefore, this IC exam simulation web application can assist to prepare for the license examination.

The future work is to study and develop an exam simulation web application for the higher level investment advisor career path such as Investment Planner (IP), and Certified Investment and Securities Analyst (CISA).

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7. References

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