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Social Interaction Web Application Design To Assess Knowledge And Practice In The Prevention Of The Spread Of The Novel Coronavirus 2019 In Thailand

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Abstract

Background: The use of social interaction web applications for health and wellbeing promotion has grown exponentially in current years. However, there are currently no social interaction web applications to assess knowledge and practice in the prevention of the spread of the novel coronavirus 2019 for the people in Thailand. The objective of this study was to develop a social interaction web application to assess knowledge and practice in the prevention of the spread of the novel coronavirus 2019.

Methodology: The steps for creating a social interaction web application to assess knowledge and practice in the prevention of the spread of the novel coronavirus 2019 are described. The researchers developed the social interaction web applications based on the following procedures: 1) analyzing and identifying components of the social interaction web application; 2) creating a pilot design for the Web application; 3) developing the social interaction web application; 4) creating the supporting materials, and 5) evaluating and revising the social interaction web Application. Two hundred seventy peoples in Thailand used a social interaction web application and provided feedback to the developers.

Result: Quantitative findings stated high to very high levels of satisfaction with the social interaction web application, regarding usefulness, convenience, quickness, and ease of access. Qualitative findings also provide evidence of the social

interaction web application's strengths and benefits, as well as challenges and obstacles. In conclusion: Thai people said that the web application useful and were satisfied with it. Widespread use of this innovative web application should be used to assess and sustain the knowledge and practice to prevent the spread of the novel coronavirus 2019, maintaining good health and promoting sustainable human well-being at all ages that is essential to the development of a healthy and sustainable society.

Keywords: social interaction web application; Knowledge; Practice; Prevention, Novel Coronavirus 2019, COVID-19

Introduction

The use of social interaction web applications and mobile applications for health and well-being promotion has increased exponentially in recent years [1]. Mobile healthcare management focuses on social interaction web applications and retrieves or accesses medical information anywhere and anytime through the application [2, 3]. Mobile pervasive healthcare technologies can help both patient and physician it supports of a wide range of healthcare services and provide various services such as mobile telemedicine, patient monitoring, personalized monitoring, and pervasive access to the health in-formation [4]. The existing system in healthcare management application has paper record information and prescription format to store the data and retrieve frantic process. To shift traditional system to the e-healthcare system data accessing, data migration, storage, maintenance, update, etc., and to develop atomic distributed system for mobile applications are achieved through the cloud computing is benefited to the people [2]. Cloud computing system provides everything as a service in a ubiquitous and pervasive manner; it facilitates to access the shared resources and common infrastructure and offering the services on demand over the network [5, 6]. In this study, we developed a social interaction web application, it has been developed from MySQL database using HTML5 and PHP script with cloud server system. The cloud computing is a paradigm which provides convenience to the users, the cloud computing provides on-demand network access to a shared pool of resources and configurable computing

resources like networks, servers, storage, applications, and services are provisioned as metered on-demand service over the network that can be rapidly allocate the resources [6, 7].

Objectives

The objective of this study was to develop a social interaction web application to assess knowledge and practice in the prevention of the spread of the novel coronavirus 2019 for the public.

Methods

3.1 Methods

Social interaction web application development. The researchers developed the web application based on the following procedures (Figure 1): 1) analyzing and identifying components of the social interaction web application; 2) creating a pilot design for the web application; 3) developing the web application; 4) creating the supporting materials, and 5) evaluating and revising the web application. The details of each procedure consisted of the following:

Step 1: Analyzing and identifying components of social interaction web application. The researchers reviewed and gathered information to identify the main components of the web Application,

Step 2: Creating a pilot design for the web Application and self-assessment questionnaire.

Step 2.1: Creating a pilot design for the web application. The researchers creating the storyboard of six main menus including 1) Personal data of those who use this web application, 2) Self-assessment on knowledge and practice in the prevention of the spread of the novel coronavirus 2019, 3) Video clip to educate about knowledge and practice in the prevention of the spread of the novel coronavirus 2019, 4) Certificate for self-assessment with a score of more than 80%, 5) Self-Assessment Test Results (Individual), and 6) self-assessment test results (by all self-assessors in the app). An entirely web application system was developed from MySQL database using HTML5 and PHP script with cloud server system.

Step 2.2: Developed the self-assessment questionnaire: The knowledge to prevent the spread of the novel coronavirus 2019 include: basic knowledge about COVID-19, incidence of COVID-19 infection, factors related to COVID-19 infection, transmission routes of COVID-19, impact of COVID-19 infection, and knowledge of practices to prevent the spread of infection such as social distancing, wearing a mask, hand cleaning, body temperature check, COVID-19 testing, get vaccinated for COVID-19, and scan “Thai Chana” application.

Step 2.3: Developed the self-assessment questionnaire: The practice to prevent the spread of the novel coronavirus 2019 include: social distancing, wearing a mask, hand cleaning, body temperature checks, COVID-19 testing, get vaccinated for COVID-19, and scan “Thai Chana” application to scan the codes to check in before entering the registered shops and scan the codes again to check out when they leave the shops.

Step 3: Developing the social interaction web application

The Web Application was designed as a web-based application that could be accessed anywhere and anytime.

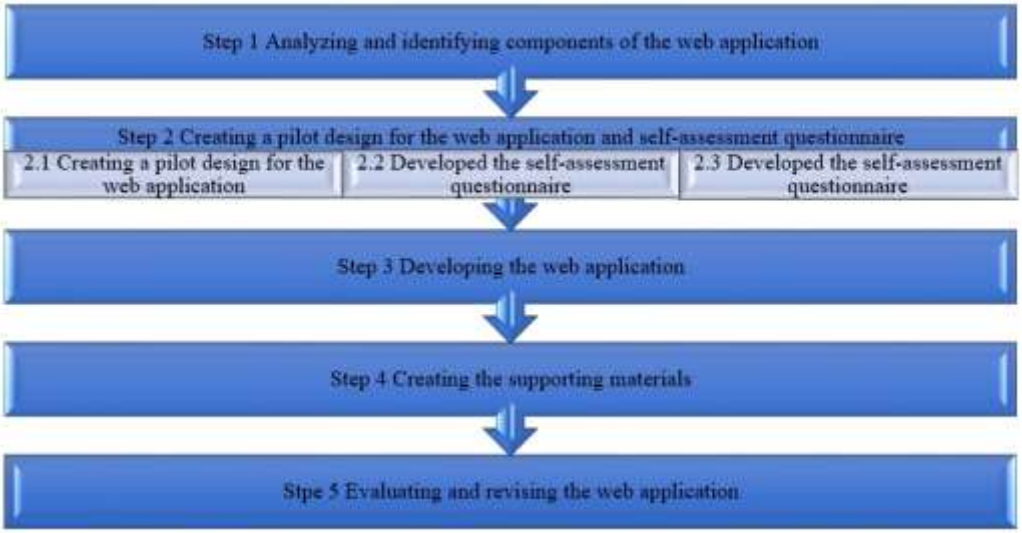
Step 4: Creating the supporting materials

Providing information about National Research Council of Thailand (NRCT) and Mohpromt Station: List of service units participating in the project of Mohpromt Station which is located near the application user.

Step 5: Evaluating and revising the social interaction web application.

The Web Application was tested for validity by six experts to ensure accuracy and appropriateness before utilizing the web Application.

Figure 1. Diagram of the web application development.



The social interaction web application of this study consisted of the following menus: 1) Personal data of those who use this web application, 2) Self-assessment on knowledge and practice in the prevention of the spread of the novel coronavirus 2019, 3) Video clip to educate about knowledge and practice in the prevention of the spread of the novel coronavirus 2019, 4) Certificate for self-assessment with a score of more than 80%, 5) Self-Assessment Test Results (Individual), and 6) self-assessment test results (by all self-assessors in the app). The Web application was designed as a web-based application (Figure 2, 3, 4). An entirely web application system was developed from MySQL database using HTML5 and PHP script with cloud server system. The web application could be accessed anywhere and anytime.

Figure 2. Example of web application screenshot.

(a) Sign in.

(b) To assess knowledge and practice in the prevention of the spread of the novel coronavirus 2019.

Figure 3. Example of social interaction web application screenshot, The result of self-assessment on knowledge and practice in the prevention of the spread of the novel coronavirus 2019.

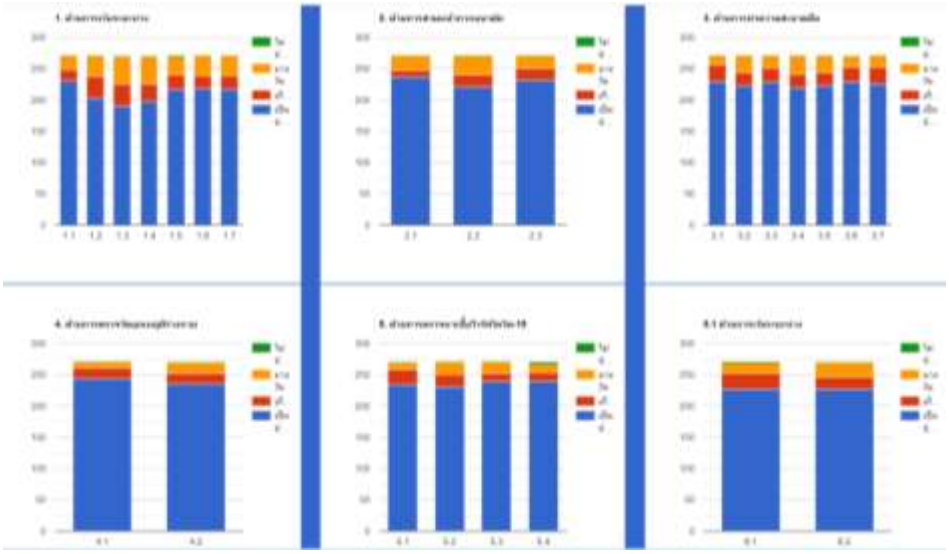


Figure 4. Example of the social interaction web application screenshot, VIDEO clip for providing the information about "How to prevention of the spread of the novel coronavirus 2019".

3.2. Satisfaction Questionnaire

A 5-item questionnaire developed by the researchers to assess usage, appropriateness, and problems/obstacles pertaining to the social interaction web application. All items were answered on a five-point scale, from 1 (least satisfied) to 5 (most satisfied). The questionnaire received a content validity index (CVI) of 0.94. The evaluation criteria for measuring user satisfaction with the web application was defined based on the average total score. Levels of satisfaction were defined as highly satisfied (4.51-5.00), very satisfied (3.51-4.50), moderately satisfied (2.51-3.50), not very satisfied (1.51-2.50), and minimally satisfied (1.00-1.50) [8].

3.3. Focus Group Interview Guide

This instrument was designed to evaluate the strengths/benefits and problems/obstacles of the social interaction web application. The interview guide was also designed to gather the respondents' feedback of how to improve the web application 's effectiveness and to meet the demands of all users.

The research tool was initially assessed by 6 experts who had expertise in COVID-19 and information technology to ensure accuracy, comprehensiveness, and appropriateness. The researchers then applied the recommendations of the experts before utilizing the instruments for research purposes.

3.4. Data collection

Ten Thai people attended group meetings to learn how to use the social interaction web application. The participants were informed that they would be asked to input personal information, such as age, COVID-19 vaccine, and getting COVID-19 Infection into the web application and 10 Thai people completed a questionnaire measuring their satisfaction levels. Focus group discussions were used to evaluate the benefits and problems of using the social interaction web application. Each discussion took 30 to 45 min. The qualitative data were analyzed using content analysis.

3.5. Data analysis

Demographic data and student satisfaction scores were analyzed using descriptive statistics, including frequencies, percentages, averages, and standard deviations. Qualitative data were analyzed using content analysis.

Results

This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions that can be drawn.

4.1 Part 1: Demographic data

The sample consisted of 270 Thai peoples. The majority of the participants were female (62.00%) with an age range between 18-74 years. Most of the participants graduated high school level; 72.00% percent never caught COVID. 98.90% of the participants have received the COVID vaccine. Average of knowledge and practice score in the prevention of the spread of the novel coronavirus 2019 (Table 1).

Table 1. The participants demographics (n= 270).

Demographics data	Percentage (%)
1. Gender	
Female	62.00
Male	38.00
2. Education level	
High school	72.00
Bachelor degree	20.00
Master degree	8.00

3. Channel for receiving information about COVID-19	
Television	20.00
Radio	8.00
Internet	72.00
4. History of caught COVID-19 infection	
Never	72.00
Caught COVID-19 infection	28.00
5. Get vaccinated for COVID-19	
Get vaccinated	98.90
Did not get vaccinated	1.10

4.2. Part 2: User satisfaction with the Web application

The web application contained the following sections: 1) Personal data of those who use this web application such as age, COVID-19 vaccine, and getting COVID-19 Infection, 2) Self-assessment on knowledge and practice in the prevention of the spread of the novel coronavirus 2019, 3) Video clip to educate about knowledge and practice in the prevention of the spread of the novel coronavirus 2019, 4) Certificate for self-assessment with a score of more than 80%, 5) Self-Assessment Test Results (Individual), and 6) self-assessment test results (evaluated by all self-assessors in the app). Participants' overall satisfaction with the web application was very high (mean = 4.52, SD = 0.56). Participants had very high satisfaction with the web application's convenience and speed (mean = 4.50, SD = 0.48) and the ease of access (mean = 4.52, SD = 0.54). In terms of usefulness, participants rated the video clip to educate about knowledge and practice in the prevention of the spread of the novel coronavirus 2019 section all as "highly satisfied". The average scores ranged from 4.50 to 4.53 (Table 2).

Table 2. User satisfaction with the Web Application.

Evaluation items	Satisfaction Level		
	Mean	SD	Level
1. Convenience and speed	4.50	0.48	Highly satisfied
2. Ease of access	4.52	0.54	Highly satisfied
3. Usefulness for self-assessment on knowledge and practice in the prevention of the spread of the novel coronavirus 2019	4.53	0.52	Highly satisfied
4. Usefulness for prevention of the spread of the novel coronavirus 2019	4.51	0.50	Highly satisfied
5. Overall satisfaction of the web application	4.52	0.56	Highly satisfied

The qualitative findings from the focus group discussions are presented below.

Category 1: Strengths and benefits of the social interaction web application

Most people noted the following strengths and benefits: 1) convenient and fast, 2) usefulness for prevention of the spread of the novel coronavirus 2019, and usefulness for self-assessment on knowledge and practice in the prevention of the spread of the novel coronavirus 2019.

1.1 Accessible and fast.

Participants found the web application highly accessible and very convenient, allowing them to assess their own knowledge and practice in the prevention of the spread of the novel coronavirus 2019 any location and at any time. The menus and user interface were user friendly, while the login system was easy and fast.

“I experienced no issues in accessing the web Application. It is convenient and fast, via internet access at home, community or public.”

“I logged in to the web application at my shop, without experiencing any problems. I was able to login to the web application right away, including when I was using it at home.”

“The links and menus are easy to find and access, including self-assessment about knowledge and practice in the prevention of the spread of the novel coronavirus 2019, Clip VIDEO and every part, easy to use”

1.2 benefits of the social interaction web application

The participants perceived that the social interaction web application allowed them to effectively assess their knowledge and practice in the prevention of the spread of the novel coronavirus 2019. The VIDEO clip also provided for the information about the prevention of the spread of the novel coronavirus 2019. The participants recommended that the web application should be applied to the public for providing the information about the prevention of the spread of the novel coronavirus 2019.

"The web application is effectively assessing my knowledge and practice in the prevention of the spread of the novel coronavirus 2019, The VIDEO clip also provided for the information about the prevention of the spread of the novel coronavirus 2019, the web application should be applied to the general public or community"

Category 2: Problems of using the web application: Internet connections.

The problems and obstacles identified with the social interaction web application use were internet connections. Participants faced issues of not being capable to log in to the Web application, or only being able to do so at a low rate, due to unstable internet connections. The connection problems may have been due to high internet traffic at the time, leading to delayed logins or unavailability.

"It was very hard for me to log in to the social interaction web Application. It frequently warned me that my Username was invalid." Successful logins depend on the internet connection quality.

"I experienced difficulties with logging in to the system. It took 4-5 attempts for a successful login. I also experienced problems with the social interaction web Application, which frequently disconnects." Accessing the social interaction web application also brought a long time, particularly during poor internet connection.

Discussion

Overall, Thia people had very high levels of overall satisfaction with the social interaction web application, its ease of use and speed, and the simplicity of accessing it according to the result from previous study [9]. Participants rated the usefulness of the video clip that provides the knowledge and practice in the prevention of the spread of the novel coronavirus 2019. This corresponded to the findings obtained from the focus group discussions. The participants perceived that the web application allowed them to effectively assess their knowledge and practice in the prevention of the spread of the novel coronavirus 2019 and sustain knowledge and practice in the prevention of the spread of the novel coronavirus 2019 through the video clip. The application also provided for the consistent storage space of data that was immediately accessible. This corresponded to previous study which explained that applications could increase the convenience of recording information online, affecting to the training development of an organization in Australia, allowing the data to be accessed at any place and time [10]. The mobile application and web application have been used as a means of continuous assessment and of evaluating clinical performances, the application capabilities can help participants to better perform self-care process, improve their health status [11-13]. The Web application therefore served as an online tool to allow for ease of use, convenience, and fast data entry [1, 14, 15]. However, this study also revealed limitations and obstacles of the social interaction web application. unstable internet connections led to lack of ability to access the information system as well as indicated from several researchers. [16]. We received the same suggestions as the previous study that identified interruptions in connection is a key factor causing to internet problems [17]. Previously study also stated excessively required fields as a difficulty, spending a lot of time for participants gain access to the information system [18].

Conclusions

The findings indicated that the social interaction web application, developed to assess knowledge and practice in the prevention of the spread of the novel coronavirus 2019, were beneficial, and Thai peoples were satisfied with using it. The web application information was accessible and useful for Thai people to prevention of the spread of the novel coronavirus 2019. The people were able to access the web application at any place and

at any time. However, the problems and obstacles of using the web application was an unstable internet connection, should be improved. The study findings suggest that the web application should be continuously implemented to assess knowledge and practice in the prevention of the spread of the novel coronavirus 2019 in Thailand.

Currently, health communication mechanisms based on paper records are old-fashioned. In this contribution, an entirely social interaction web application system was developed from MySQL database using HTML5 and PHP script in cloud computing environment and this social interaction web application not only assess the knowledge and practice to prevent the spread of the novel coronavirus 2019 but also sustain the knowledge and practice to prevent the spread of the novel coronavirus 2019 through the video clip. Therefore, the web application is benefited to Thai people for prevention of the spread of the novel coronavirus 2019 in Thailand. This social interaction web application can be maintaining good health and promoting sustainable human well-being at all ages that is essential to the development of a healthy and sustainable society.

Future study

There is a capacity for social interaction web applications to design and improve the services by developed techniques on the mobile devices through voice detection, exchanging pictures, and service are most accessible to the user.

Study limitations

All the people who tried this social interaction web applications live in Chiang Mai. We have not collected data from every province or region of Thailand.

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