

The Development of Web Application to support the Operation of Community Health Volunteers in Bangkok

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Abstract

The purposes of this research were as follows: 1) To design and to develop web-based application by using mobile devices to contribute to CHV that will use to manage health care services, record-keeping, reporting, and to disseminate information, 2) To test the efficiency of web application by three computer specialists; and 3) To investigate the volunteers' opinion toward the web application system to promote and improve quality of the CHV's operational and access to information technology. There are three access level control included in the smartphone application: public is the default access level assigned to all parts of the front end for any visitor can view anything but cannot log into the system, registered access level will hide some features from visitors, which was a member of a group of the community health volunteers that in turn have permission for this access level allowed full volunteers interaction, and special access level is for the back end of the system that is everything in the system's administration panel is assigned to the special access level so it is accessible only to the users who have access to it. The population consisted of 30 volunteers who were enrolled in the community health volunteers of Bueng Kum 50. The sample was selected by using purposive sampling method. The results of these analysis showed that (1) the efficiency of the smartphone application was 4.44 which was the highest of rating scale; and (2) the volunteers' opinions toward the web application were 4.32, this means that the volunteers' satisfaction was the highest of the rating scale.

Keywords: Web Application, Mobile Application, Community Health Volunteers

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Introduction

Since, the second Bangkok Metropolitan Administration development plan (1982-2016), the Bangkok Metropolitan Administration's health care policy is designed to increase collaboration and alternatives for people more access to afford coverage and health care development by enrolling volunteers for training about the primary health care. These volunteers are about to share the knowledge and experience of training with rural communities. The Bangkok Metropolitan Administration was provided the volunteers into 3 groups, which were: 1) Reporter Health Volunteer (R.H.V), 2) Village Health Volunteer (V.H.V), and 3) Slum Health Volunteer (S.H.V). In 1992, the Bangkok Metropolitan Administration grouped them into one group as named "Community Health Volunteer", and now, there are more than 15,000 volunteers with rural coverage in Bangkok, which consist of leadership, service person, consult personally, and reporter health volunteer. (Community Health Professions Act, B.E. 2556: 10).

Community Health Volunteer was initiated from community participation and intersectoral collaboration, which is among cooperatively different social groups which enable them to solve a public health that rural coverage in Bangkok more than 30 years. CHV aims to support public health care, to prevent disease, to prolong life, promote human health, and analyze the health of a population and the threat is the basis for public health. (Sukhumbhand Paribatra, B.E. 2556)

The main concept of the CHV is the community participation for supporting primary health care and reoriented basic health service. The CHV will be working in the rural communities of Bangkok, focusing on fourteen main functions are as follows: 1) To provide knowledge or inform the importance of personal hygiene and cleanliness, and to assist in providing free health check-ups for families who can't afford to meet a medical professional, 2) The nutrition involved identifying problems can be prevented or reduced with a healthy diet and reduced poor diet or malnutrition, 3) The family planning will



be provided people to make informed choices about their sexual and reproductive health. It is the most cost-effective way to prevent maternal, infant, and child mortality. It will be reduced maternal mortality by reducing the number of unintended pregnancies, the number of unsafe abortions, and the proportion of high-risk births, 4) The immunization will be a proven tool for controlling and eliminating life-threatening infectious diseases, typically by the administration of a vaccine which keep children alive and healthy by protecting them against disease. It is especially important for the hardest to reach families as it can also be a bridge to other life-saving cares for mothers and children in isolated communities, 5) communicable disease prevention and control, the CHV provided the impoverished and disenfranchised with the tools, education, and support people need to prevent disease to promote wellness in their communities, to learn, to practice, and to instruct healthy habits, 6) To provide clean water or running water and solid waste disposal which solid waste can create significant

health and a very unpleasant living environment if not safe and appropriate disposed. It may also pollute water and the environment, 7) To provide primary health care that is based on scientifically sound and socially acceptable methods, which make primary health care service accessible for all individuals and families in a community, 8) To provide household remedies and herbal remedies for common medical problems that can be used to cure from minor ailments to diseases such as asthma, diabetes, and etc., 9) To disseminate knowledge and to promote dental public health for improving the dental health of people, 10) To find out the community mental health devoted to the evaluation and improvement of public sector mental health services for people affected by severe mental disorders, serious emotional, disturbances and addictions, 11) To focus on accidental prevention and to take action for the protection of people's safety and health is an obligation of each people for all areas, finding common accidental prevention schemes due to the complexity of accident causation, 12)

To take action about consumer protection that is available to protect people from scams, unsafe products, unfair treatment from business, it also provides additional protection for those most vulnerable in society-particularly in areas where safety or public health is an issue, such as food, drug, and etc., 13) To take action in the biological treatment of pollutants or pollution control and prevention which some various pollution problems that have caused people to face disasters. The CHV will be supporting a group of people who mutually raise awareness about the importance of saving the world from all natural environment problems, and 14) To share knowledge and to take action on the basics of HIV/AIDS prevention and transmission to people, and also reduction their risk of HIV infection. (Health Promotion Division: B.E, 2556)

As mentioned above, the role of CHV is effective resources to make people be aware of health issues and improving health outcomes, to deal with the health problems of individuals and the community, and to work closely with the health services. The CHV promotes

health and mobilizes communities which lacked access to health care, helps identify community problems, and can respond creatively to local needs and within a local context. Through the roles of CHV consist of activities aimed at teaching the community to improve its health practices, as well as the promotion of latrine construction and hygiene, identified the gratifying nature of serving others, and the responsibility given to them as their personal motivations for serving in a volunteer capacity. CHV is allowed to report, decide, and refer to the emergency cases. Thus, CHV needs suitable technology for supporting the operation that corresponded to the tenth national economic and social development plan (B.E. 2550-2554). The CHV's application developed by researchers will be greatly improved data accuracy, timeliness, and services quality and encouraged data-based decision making by local health officers/members, with data going directly to health centre or main system in the real time. The smartphone application used by the members of CHV will be used to manage their health

services, report, record, and disseminate information. The smartphone application is used to disseminate the message to CHV system with reminders about key health information, upcoming health campaigns, events, and activities as well. It aims to improve health service delivery to communities and to improve the quality of an access to data. The members of CHV will enter the biographical or geographic information of patients into the application to setup the personal record for each area. Areas and users/members were selected based on geographic accessibility by using Google Map and mobile or Internet connectivity which they must attend training for using an application and reporting workflow. The smartphone application eases the reporting workflow for CHV that head of health centre will be able to monitor community health data from the CHV's system under his/her supervision. For corresponding to policies of office the National Economics and Social Development Board, B.E. 2549 are as follows: 1) CHV will be in charge of this role at least 30 families for each area in Bangkok, 2) To collect, to evaluate, and

to store data of each family into database, 3) To be in charge of primary health care for each family, 4) or special care to target groups, such as pregnancy or adolescent pregnancy, postpartum period, infant, elder, and disabled, 5) To take action or to participate in health activities for each area, and 6) To take record of monthly operations by using appropriate information technology to implement in this project.

Objectives

The purpose of this study will be as follows: 1) To design and to develop web-based application by using mobile devices to contribute to CHV that will use to manage health care services, record-keeping, reporting, and to disseminate information, 2) To test the efficiency of web application by three of the computer specialists; and 3) To investigate the volunteers' opinion toward the web application system to promote and improve quality of the CHV's operational and access to information technology.

Methodology

1. Research design

The type of research that will be used in this study is a development and experimental. The smartphone application developed by the researchers is to be aware of its effect to a pedagogical model and how the researchers get more use to members of CHV to use it.

2. Population

The population is consisted of two information technology specialists, one public health officer, and thirty user members of the CHV in Bueng Khum#50 (30-60 years old).

3. Sampling method

The research sampling method that will be used in this study is purposive sampling (both specialists and user members) to obtain a more scientific result that will be used to represent the entire population.

4. Research instruments

The instruments used for this experiment were: 1) Smartphone application offers the operation of community health volunteers in Bangkok (CHV: Bueng Kum # 50), 2) To test the

efficiency of smartphone application by two of the information technology specialists and one public health officer by testing the system and using questionnaires; and 3) To investigate the volunteers' opinion toward the smartphone application system developed by the researchers by using questionnaires.

Results and important findings

1. Designing and developing of smartphone application

Smartphone application will be supported both of iOS and Android (including OS on PC). There are many useful features and interfaces of the application to display certain parts of system for supporting member operations are as follows: 1) General information for CHV's members and/or all users such as, news, pictures collection from all activities, press release, video clips that related public health care as shown in Figure 3, 2) Database and families' records for each local area that consisted of family operating annual summary report, pregnancy records, postpartum records,

infant records, elder records, disabled records, and chronic patient records, 3) Proactive operating report, 4) Primary health operating report, and 4) Mosquitoes survey. In addition, there is a message report system that will allow members to send message report from each rural area via smartphone application. Message reports will be contained with information about news, The main operating functions of application consisted of three access level control are as follows: 1) Public (anonymous system) is the default access level that is assigned to all parts of the front end for any visitor can view anything but cannot log into the system, 2) Registered (user account system) access level will hide some features from visitors, who are members of a group of the community health volunteers that in turn have permission for this access level that is allowed full volunteers interaction and members can login to the system as shown in Figure 1. Users with access to the administrative back end will be able to view and modify all events without restriction, to manage privacy and personal

information, and etc. as shown in Figure 2, in case of user forgetting login password is quite common situation. Interface supports self-reset password mechanism allowing to solve the problem without engaging any operators, and 3) Special (administration control panel system) access level is for the back end of the system that is everything in the system's administration panel assigned to the special access level so it is accessible only to the users who have access to it. Their roles for the operations are able to perform at the site level, to provide a complete set of tasks for users and a content management and all of control panel management or to control user actions by enabling or disabling the associated permission on the web application called personal management. Audit-database web application is used for Internet messaging administration. There are applications for specific user types (Personal/Anonymous, Registered/Delegated, and Special/System Administrator). The audit-database specific servlets works with data stored in audit database but use

directory for its authentication and access control. Admin-system collected specialised directory viewing/editing servlets allowing them to manage and specific entries. In addition, the system consisted of statistics system by using information stored in the audit-database, it is possible to generate various statistical reports such as summary of message delivery and various status for member operations in form of the summary list/summary chart and including detailed information on

messages, and absolutely, administrator will be able to handle and to manage all parts of control panel system on PC.

Performance testing was used with a total of three respondents/specialists found that means of rating scale was 4.40, performance in the implement tests and execute tests were 4.40, and performance in the responsiveness, throughput, reliability, and scalability of the system were 4.53 that the highest of rating scale.



Figure 1: Homepage of the CHV smartphone application for members to login

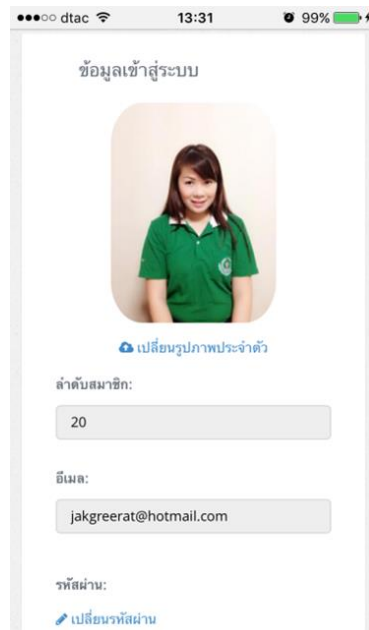


Figure 2: Shown the personal information of CHV's member

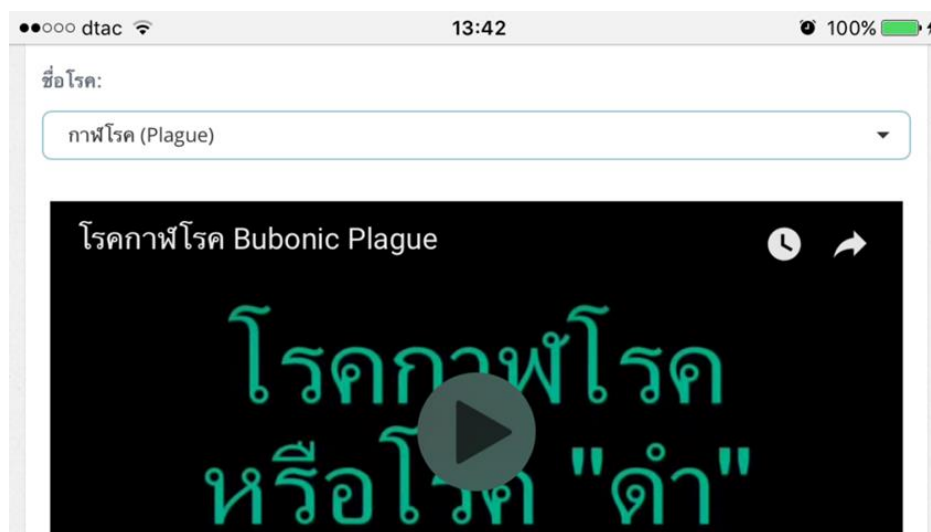


Figure 3: Shown video clips are related public health care

2. Results of testing the efficiency of smartphone application

The performance used in this experiment consisted of the following activities as follows: 1) To identify test

environment, 2) To identify performance acceptance criteria, 3) To plan and design tests, 4) To configure test environment, 5) To implement test design, 6) To execute tests, and 7) To analyse report. These will be provided the steps for managing and conducting performance testing which are put into activities with inputs, outputs, and other steps. Performance testing was used with a total of three respondents/specialists found that means of rating scale was 4.40, performance in the implement tests and execute tests were 4.40, and performance in the responsiveness, throughput, reliability, and scalability of the system were 4.53 that the highest of rating scale.

3. Result of survey the volunteers' opinions toward the application

The results of the volunteers' satisfactions were as follows: 1) Means of rating scale in satisfactions toward the application was 4.32, 2) Performance in the responsiveness, throughput, reliability, readability, easy to use, and etc. were 4.32, and 3) Responding performance into activities with inputs,

outputs, and other steps, including the communities required were 4.33 which were the highest of rating scale.

Discussion and Recommendations

Based on the important findings, it was recommended as follows: 1) Performance and efficiency of the application conducted to accomplish the following as all of design and all environments of system that were used suitable technology. System development life cycle of innovation consists of main 3 phases, such as analysis and design phrase, development phrase, and implementation or deployment phrase. Boonkua Kuanhawech (B.E. 2543: 292) [1]. Online learning is about the learning across contexts, through social and content interactions by using personal electronic devices which it's accessible from virtually anytime and anywhere (National Electronic and Computer Technology Center, B.E. 2545) [2]. Many organisations used information technology to support a variety of new organisational practices and organisational forms into work places and their effect on works to

increase and maintain work performance. Chaivong Promvong (B.E. 2545) [3]., and 2) All useful features and functions of the smartphone application were a greater and different access the role performance among the CHV's team work in Bung Khum#50 and its associated factors. This led to satisfy the members toward an application. Mobility, immediacy, and instrumentality were found the strongest instrumental motives in predicting the use of cellular phones, followed by intrinsic factors such as affection/sociability (Leung & Wei, 2000) [4]. Mass communication itself does not perform as a necessary and sufficient cause of audience and typically reinforces existing conditions, rather than changing them (Klapper, 1996) [5]. Information technology was used as a powerful tool to improve employees' quality and efficiency. This led to a better performance accompanied by

higher efficiency in service providing all of which would cause more satisfaction from fast and high-quality services (Suriya Natesirikul, B.E. 2546) [6].

Conclusions

The results of these analyses showed that (1) The efficiency of the smartphone application was 4.44 which is the highest of rating scale; and (2) The volunteers' opinions toward the web application were 4.32, this meant that the volunteers' satisfaction was the highest of the rating scale. Performance testing was used with a total of three respondents/specialists found that means of rating scale was 4.40, performance in the implement tests and execute tests were 4.40, and performance in the responsiveness, throughput, reliability, and scalability of the system were 4.53 that the highest of rating scale.

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