THE DEVELOPMENT OF GOOD TASTE BEST SANITATION RESTAURANTS RECOMMENDING SYSTEM BASED ON ANDROID OPERATING SYSTEM

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Abstract- This research aimed to analyze the data and develop Good Taste Best Sanitation Restaurants Recommending System based on Android Operating Systemby using the Collaborative Filtering Technique to filter data for rating of recommendation the restaurant. The system could show map of the restaurant with the Google Map API Technology for the information to support decisionmaking. The system was developed as an mobile application on the Android Operating System. To evaluate the preliminary prototype system, questionnaires were used to measure user satisfaction with system usability and interview to evaluate performance of system by specialists and users. Experimental results reveal that the system is well able to recommend Good sanitation restaurant information both users and experts and this application can be adapted to users easily due to the fact that the data is stored and available on mobile devices. Also the results were satisfied in the effectiveness as well follows: Means for specialist and users were 4.00 and 4.01 respectively, and standard deviation for specialists and users were 0.51 and 0.66 respectively.

Index Terms- Clean Food Best Sanitation, Restaurant, Application,Android Operating System

I. INTRODUCTION

The technological change and growth in the mobile market has made it very challenging for developers to strategically plan a bespoke project, not only from a technical standpoint, but also because the market share for smartphones is changing rapidly between different systems.

The extensive use of smart mobile devices and mobile applications provides new opportunities for companies. The modern consumer is often referred as to be social, local, and mobile [4]. Recommended places on smart phone called a wizard for a new era that will facilitate the search for locations such as Good Restaurants. Thailand's Department of Health have project to control and define standard forsanitation restaurant that is "Clean Food Good Taste". Currently, there are many restaurants to choose, each of which has a different quality that make a difficult decision in choosing restaurants. Because most of consumers often chosen the restaurant based on their experience, good decorations, the recommendations from friends, or advertising. That support consumer to decision choose restaurant certainly but limited the information of

restaurantfrom other. So choosing should be based on relevant factors such as taste, view, service, price, etc. When consumers make decision with limited information available does not appropriate with the requirements.

With the rapid growth of information technology, mobile technology is one of the easiest and fastest efficient tools to support and help in this era. Therefore, it is worthwhile to provide education in the rituals and practices of education for people by using mobile application technology as the channel for dissemination of the rituals and practices of the rice implantation, because the users can access this application at any place and any time.[6]

This research aims to develop a Good Taste Best Sanitation Restaurants Recommending System based on Android Operating System which will be useful to users. By used collaborative filtering technique for rating rankings of restaurant and connected Google Map API to direct restaurant map for respond users requirement effectively. Moreover,it is also the information for the tourists decided to choose restaurants and directions to facility.

II. THE PURPOSE OF THE RESEARCH

The objectives of this research were:

1) To develop aGood Taste Best Sanitation Restaurants
Recommending System based on Android Operating System.

2) To evaluate performance of Good Taste Best Sanitation
Restaurants Recommending System based on Android Operating System.

III. LITERATURE REVIEW

The research for Recommending Scholarship of the Office of the Civil Service Commission to obtain data for analyze effectively. Therefore, studied and searched research guideline data, including theory and technology related to the research as follows:

A. Recommender System

Recommender System is recommended system information products and people. Hereinafter referred to as Items to users based on the assumption of

learning preferences or needs of the user at that time. The recommendations become an important research topic since the appearance of research Collaborative Filtering. In the mid-1990s, by the early success of the system introduced arose from the growing business of electronic commerce. Recommender systems are a useful alternative to search algorithms since they help users discover items they might not have found by themselves. Interestingly enough, recommender systems are often implemented using search engines indexing non-traditional data. In use, the system was recommended. The network currently doing business with the internet and social networking consecutive increase. It is interested to implement the recommendations to support decision making. [3]

B. Clean Food Good Taste Project

This project is due to government policy on the control of food establishments. The Government and the Ministry of Health to facilitate Thai's people have good health and ensuring health. The Ministry of Health is responsible for such. Thus set up a system to make health a concrete response to government policy. Both health Social and economic aspects of food safety.

The government has policies that will control the food supply to consumers. To facilitate "Restaurants and stalls where sanitation standards", especially around the school and in the school. And to facilitate a fresh market that has been standardized and suitable to buy. The Ministry of Health has a policy of local government at a tourist attraction in the area is responsible for controlling food establishments, according to the Public Health Act 1992. To provide food establishments has continuous improved the food service to clean and secure. And is known to tourists for local government implementation of the project "Clean Food Good Taste" coordinate with the law for the promotion of people and tourism health.[10]

C. Collaborative Filtering

Collaborative filtering is a technique used by some recommender systems.[3] Collaborative filtering has two senses, a narrow one and a more general one. [4] In general, collaborative filtering is the process of filtering for information or patterns using techniques involving collaboration among multiple agents, viewpoints, data sources, etc.[1] Applications of collaborative filtering typically involve very large data sets. Collaborative filtering methods have been applied to many different kinds of data including: sensing and monitoring data, such as in mineral exploration, environmental sensing over large areas or multiple sensors; financial data, such as financial service institutions that integrate many financial sources; or in electronic commerce and web applications where the focus is on user data, etc. The remainder of this discussion focuses on collaborative filtering for user data, although some of the methods and approaches may apply to the other major applications as well. Collaborative filtering systems have many forms. It can be based on implicit observations of normal user behavior. These systems observe what a user has done together with what all users have done and use that data to predict the user's behavior in the future, or to predict how a user might like to behave given the chance. These predictions then have to be filtered through business logic to determine how they might affect the actions of a business system. [5]

D. Google Map Directions API

The Google Maps Directions API is a service that calculates directions between locations using an HTTP request. This service is also available as part of theclient-side Google Maps JavaScript API, or for server-side use with theJava Client, Python Client, Go Client and Node.js Client for Google Maps Services. The same daily usage limitsapply regardless of how you use the service. The requests per day are calculated as the sum of client-side and server-side queries.This video illustrates the use of the Google Maps Directions API to help people find their way and includes advice on proxying the web service via your server when you're using the API in a mobile app, to protect your API key.Calculating directions is a time and resource intensive task. Whenever possible, calculate known addresses ahead of time and store your results in a temporary cache of your own design.

The Google Maps API previously required that you include the sensor parameter to indicate whether your application used a sensor to determine the user's location. Build a custom map for your Android application using 3D buildings, indoor floor plans and more.Get data from the same database used by Google Maps and Google+ Local. Places features over 100 million businesses and points of interest that are updated frequently through owner-verified listings and user-moderated contributions. [15]

IV. SYSTEM FRAMEWORK

A research methodology to develop the Good Taste Best Sanitation Restaurants Recommending System based on Android Operating Systemhas process in research as follows:

1) Data Preparation: to prepared information to design, develop, how to use tool for development. To studied theories and techniques that are used to develop system.

2) Data Collection: to collecteddataof restaurants to filtered and classified data with classification technique to set categories of all restaurant in Clean Food Good Taste Project between 2010-2015 from Website of Bureau of Food and Water Sanitation for facile to search. [2]

3)Data analysis: to analyze input data for data processing to recommend in the analysis utilized the data form variables that match with users requirement

mostly divided type of restaurant, price, keyword and location.

4) System Analysis and Design: In analysis and design to set system framework, will use analysis and design with system diagram as stepfollow:

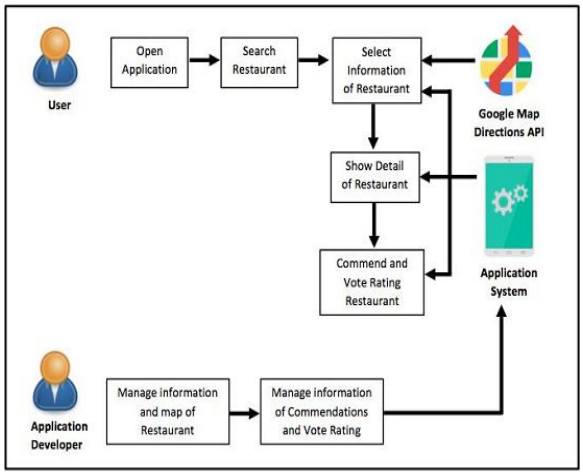


Fig.I System Flow Diagram of the Good Taste Best Sanitation Restaurants Recommending System based on Android Operating System.

First process, user open application, system show first page have menus for user choose to see information that their requirements. After that, user choose way to search. System process data and use Google Map Directions API to connect map of restaurant, and show details of recommended restaurant. Users can commend and vote rating about restaurant, and system will collect data and statistics to the popularity of each restaurant. Application Developer can manage information and map of restaurant, and manage information of commendations and vote rating for restaurant.

5) System Development: by program coding with JAVA to create system and connect database on Android Studio and connected to direct location by Google Map Directions API. Statistics of Restaurant recommendation with Collaborative Filtering technique to managed and displayed rating of restaurant by users review and add rating from using system.

6) System Testing and evaluating:When testing and evaluating the qualities of the system, Black box Testing, Questionnaires and Interviews by specialists and users were used to test this project.

To evaluate the quality assessment system, Mean ($\bar{x}$) and standard deviation (SD.) were used to evaluate the abilities of the project. Black Box testing was used to determine the error of the project as following:

1) functional requirement test 2) Function test 3) Usability test 4) Performance test and 5) Security test.

V. RESULT OF THIS SYSTEM

In this research, we separated the result by the research purposes into 2 parts: developing the mobile application in Good Taste Best Sanitation Restaurants Recommending System based on Android Operating System and testing and evaluating the system.

A. Developing the mobile application

Developingthe Knowledge based with on mobile technology about “Clean Food Good Taste” Project, Food and Health News, and Online article about restaurant with RSS Feed technology. (Fig. II) For the part of Recommend

Application on mobile, users can search information of restaurant in “Clean Food Good Taste” Project with 3 ways included type of restaurant, price of food, keyword. As following Fig. III)





Fig. II Home page of System **Fig.III Page of Search Restaurant**

When user searched, system will process to find information of Restaurant (Clean Food Good Taste) and show detail of restaurant that system recommended (Name, Pictures, Details, Highlight, Map to directions and Rating by other users reviewed and recommended) as following Fig. IV



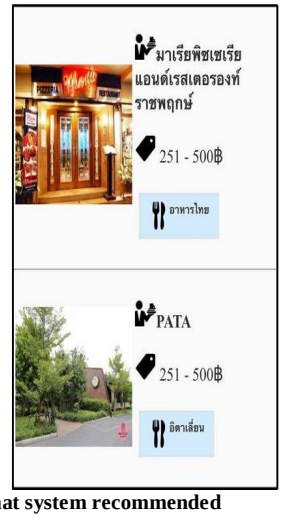


Fig. IV Show restaurants that system recommended

After that, users can choose to see more information in each restaurant that show map to directions as followingFig.V, VI



Fig. V Detail and Map of Restaurant

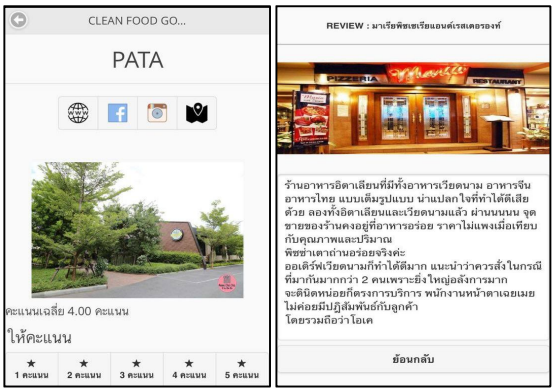


Fig. VI Review restaurant from other Users or Customers who visited each restaurant

In additions, users can see reviews and ratings of each restaurant by others, and can post review and vote rating for each restaurant by themselves as following Fig. VII

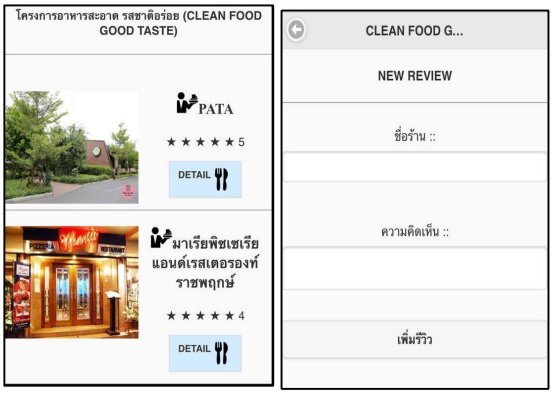


Fig. VII Show Rating of restaurant by others and users can post their reviews

B.Testing and evaluating the qualities of the system

When testing and evaluating the qualities of the system, Black box Testing, Questionnaires and Interviews by specialists 5 person and users50 persons from purposive sampling were used to test this system. To evaluate the quality assessment system, Mean ($\bar{X}$) and standard deviation (SD) were used to evaluate the abilities of the project. Black Box testing was used to determine the error of the system as following: 1) functional requirement test, 2) Function test, 3) Usability test, 4) Performance test and 5) Security test.Functional Requirement Test evaluated the ability of the system in needs of the users and Functional Test wasassessed to evaluate the accuracy of the system. Usability Test tested the suitability of the system. Performance Testwas used check the processing speed of the system.

Finally, Security Test evaluated the security of the system.Table I.

TABLE I
THE PERFORMANCE EVALUATION OF SYSTEM WITH COMPUTER SPECIALISTS

Evaluation descriptions	Effective levels			No.
	$\bar{X}$	S.D.	Qualitative Average mark	
1. Functional Requirement	4.20	0.55	Good	2
2.Functional ability	4.05	0.60	Good	3
3. The system usability	4.22	0.35	Good	1
4. The system performance	4.00	0.41	Good	4
5. The system security	3.54	0.62	Good	5
total	4.00	0.51	Good	

The overall of the research results reveals effectiveness of 5 aspects, total effective are in good level ($\bar{X}$ = 4.00) respectively. Recommendations of performance evaluation system is to add restaurants information from other organizations to suggest for users. Design system should add or use vibrant colors and more developing application techniques that make it look even more attractive.

The result of the satisfaction evaluation in using of system with users for test the integrity and accuracy of the system and to evaluate the performance of system. The results are as following Table II.

TABLE II
THE PERFORMANCE EVALUATION OF SYSTEM WITH USERS

Evaluation descriptions	Effective levels			No.
	$\bar{X}$	S.D.	Qualitative Average mark	
1. Functional Requirement	4.28	0.73	Good	1
2.Functional ability	3.97	0.67	Good	3
3. The system usability	4.05	0.72	Good	2
4. The system performance	3.95	0.67	Good	4
5. The system security	3.80	0.49	Good	5
total	4.01	0.66	Good	

The overall of the research results reveals effectiveness of 5 aspects, total effective are in good level ($\bar{X}$ =4.01) respectively. Recommendations of performance evaluation system should have information from other sources and the most current updates. The system should provide a more interesting format to appeal to the needs of users. And processing systems are included in more quickly.

CONCLUSIONS AND DISCUSSION

In this paper, we presented recommend system for the recommended and directed the Restaurant in "Clean Food Good Taste" Project was developed as an application on the smart phone for Android operating system.The system can support users easily search for nearby restaurants. Users can comment and vote rating their satisfaction with the restaurant. User can read plenty of reviews, and even view great local deals and photos of the place. Search filters ensure that you can narrow things down according to distance, price, and rating, so you know exactly what you're getting into. It works well for plenty of other establishments too.And the system can show and direct maps by Google Map Directions API technology to the restaurant. Moreover, the development of function of this application also helps encourage users and consumers have known restaurants in the Clean Food Good Taste. And facilitating direct map and display of food to recommend and support the decision of the consumer effectively. Recommender system is a specific type of intelligent systems, which exploits historical user ratings on items and/or auxiliary information to make recommendations on items to the users. It plays a critical role in a wide range of online shopping, e-commercial services and social networking applications.[11]

However, in terms of future experiments, we are looking forward to research about other new techniques to enhance this project.

ACKNOWLEDGMENTS

The authors would like to thank Suan Sunandha Rajabhat University, Bangkok, Thailand (http://www.ssru.ac.th) to provide funding support to attend the dissemination of research on this and thank family, friends, colleagues and students in the field of Information Management for cooperation in research, all of you.

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