

Food Ordering and Management System

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Abstract- In the present that is the 21st century, a smart device is the most required device which is becoming an obligatory factor in the modern complex lifestyle of human beings. As humans, each one of us is thriving to seek the ease of every activity in day to day life. Food Ordering and management application are developed as a solution for the issues occurred in the industrial organizations when placed food orders for their employees. As time is limited to employees in organizations most of the time taking their daily meals has become a neglected task. The project was focused on this problem. Therefore, a particular research project was aimed to develop administrative web application and two mobile applications for the Android and IOS platforms to ease the procedure of placing orders on food and beverage preferences of employees on a particular industrial organization to notify the logistic division about the daily requirement summary on food. When compared with existing systems this system contains several unique features such as keeping monthly payment for orders by the employees and the ability to order food from both external and internal providers. Therefore, this paper was aimed to provide depiction on this food ordering and management system

Keywords- Food ordering, web application, Administrative web site, Mobile applications, External, Internal

I. INTRODUCTION

In the present world with the effect of technological advancement, most of the tasks in day to day life can be done with less effort. Since each and every person is heavily attached to the technology even a small activity is in the fingerprint away from a connected person [8]. The world came to a turning point of technology with the development of smartphones.

Every person even the people who are living in third world countries are also using smartphones and they are being evolved with the technology. Since people are starting to work inside the building of a company or organization, they are supposed to build their secondary life inside of their working place. While spending their life

in workplaces, meals that have to be taken during their working hours have become a neglected task due to their hectic lifestyle. Since these people are limited with the time with their work schedule, decisions they have to be taken should be more accurate and less time consuming [8]. Therefore, when it comes to meals, it should be an easy task than being the best choice. Even though most of the organizations used to supply the daily meals for the employees it has become ineffective solution as the individuals cannot select their meals according to their preferences. Therefore, it consists of many negative consequences as the individuals can be misguided with unhealthier eating patterns. It is more effective if there is an efficient way of ordering their meals according to preferences internally from the organization or external restaurants. In today's age of fast food and takeout, many restaurants have chosen to focus on quick preparation and speedy delivery of orders rather than offering a rich dining experience [2]. As said ordering the food for the employees working on a particular workspace, The Company has an important task having a healthy, energetic workforce which leads to greater productivity.

The aim of the project was to develop a mobile and web application to ease the process of taking orders on food beverages preferences of employees on a particular company or organization to notify the logistics division about the daily requirements on food.

This research paper focuses on providing an efficient and productive food ordering system for the employees of an organization in order to achieve higher levels of overall productivity. In introduction focuses on other similar existing food ordering systems. Related work chapter describes the approach that has been undertaken to develop the system. Analysis and design chapter provides the design and analysis of the system. Implementation has been discussed in section Implementation section. Next chapter which is Results and next one provides information about the results of the evaluation. The conclusion is described before the chapter of Potential further developments.

II. RELATED WORK

In this section contains a detailed description of a similar system to the proposed system that found out which are already have done by others. This section provides advantages, disadvantages and key features of those systems that have been identified by going through those system features [2]. It was identified that, though there are so many food ordering methods and applications, there is no such an application that have all the features. Each existing system is having some of those features [4]. The existing systems are as follows, “Food Panda”, “Foodie.lk”, “Zomato”, “Feedme.lk” and “WFOS”.

All of those applications and systems are developed and constructed to place and deliver orders to people when they are in their domestic life or when they are placing orders as individuals [10]. But what proposed system tries to solve is find a system to simplify the process of placing orders of all employees in a workplace without using a manual method. Some of the related existing application systems are up and running systems but they are not concerned about the aspect of this problem which is the identified problem. Some systems which have been studied are of good standards but more focused on the delivering and orders taking from individuals rather than taking the bulk of various orders. And on the other hand, some systems are failures among users since they have a complicated and time-consuming method of placing orders. And those all the systems are based on immediate payments after placing orders.

By going through these existing systems problems were identified as some major issues of existing applications. Namely, Service Depend on the customer location, Limited number of menus is available online, Food may not be good as appear in the app, differences between app and shop, Poor user experience, Poor user interfaces, Misunderstanding and frustrations of customers, Lack of promotion and engagement, before, during and after launch, Efficiency of the app and delays of function of a app and process.

The above matters are the issues in current existing systems that have been identified. It is found that each similar system is having at least one of the issues listed above. Those applications are mainly focused on the common world, but the proposed solution is specially made for those who are working in a company and those who are having a busy working life inside the company. This solution will bring an easy and comfortable task for the food coordinator of a particular company. Not like other systems, the proposed solution will not reduce their job opportunities for people.

Similar Systems Features	Food Panda	Foodie .lk	Zomato	Feedme. lk	WFOS
1. Online ordering.	✓	✓	✓	✓	✓
2. Menu management		✓			✓
3. Rating system.	✓	✓	✓	✓	
4. Easy to find restaurants	✓	✓	✓	✓	
5. Available in any country	✓		✓		
6. Platform compatibility	✓	✓	✓		
7. User notification system					✓
8. Easy payment system	✓	✓		✓	
9. Both external & internal ordering facility					

Table 1: Comparison between existing Software Systems

III. APPROACH

When developing a system, it is important to choose suitable approaches in order to get the expected final outcome [3]. Major functional operations were selected as the appropriate approach. The system is developed using three main modules and sub-modules. Our approach is majorly based on the waterfall model and modular approach. The approach is a mixture of modular and waterfall model. Waterfall model is describing the main stages in the software development process. For each module of the system, the waterfall model is applied. There are five phases in waterfall model they are,

Requirements definition, System and software design, Implementation and unit testing, Integration and system testing finally Evolution and maintenance. When parsing through these each phase performance and progress can be easily measured.

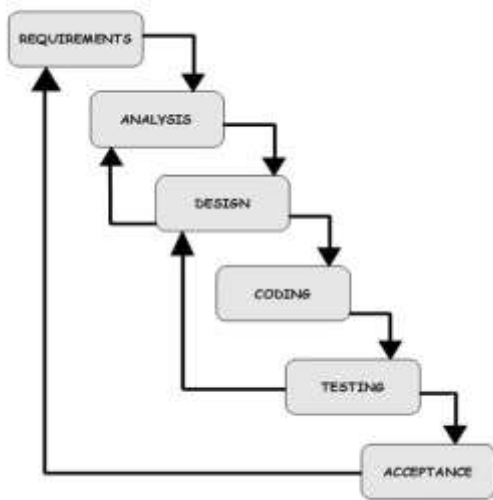


Figure1: waterfall model

The modular approach describes how a software system is can be divided into small parts and how those modules can analyze, implement and develop effectively. The proposed system consists of three main modules. They are namely, developing the Interface to the employee, developing the Interface on the food coordinator, developing the Server Side and developing the interaction between the modules. The interface was developed using android studio and ionic 3 cross platforms. It provides an interface to the employees of the company.

The web application module is developed as an interface for the food coordinator. It was developed using Symfony, Bootstrap and Google charts. This main module contains sub-modules that can update, view, sending notifications. This web application always synchronizing with database and all the details and operations done by through database.

In the server-side module, OrangeHRM server is used as the main server. Server module contains two databases, they are company database and the system database. Databases are implemented using MySQL [6]. To have a proper interconnection between modules, android, and ionic 3 application is always stays connected with the database.

Users	Employee, Food Coordinator
Inputs	Menus, Orders, Menu items, Item prices
Outputs	Summary of orders, Total Amount,

	External Restaurants' contact details
Process	Collecting Orders, Updating Menus, reminding meals, summarizing orders, Display Monthly analysis, Displaying Menu items
Techno gy	Android, Ionic 3, MySQL, Symfony, Bootstrap

Table 2: Summary of Our Approach

IV. ANALYSIS AND DESIGN

Figure 2 shows the main components of the proposed food ordering and management system. There exist three main components as the user interface, web application, and database.

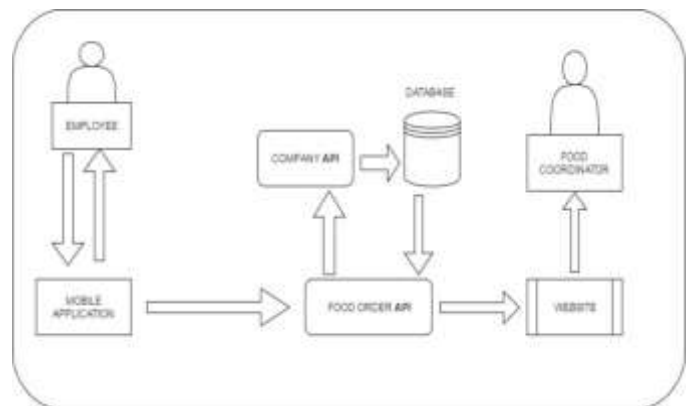


Figure 2: Top Level Architecture of the Proposed System

A. User interface

It is the mobile application that is developed for the employees. It is developed using android studio and ionic 3 cross platforms. Using these technologies two mobile applications intended to implement. The interfaces should be user-friendly and attractive .it will have all the new features that have analyzed from similar systems.

B. Web application

It is the web interface for the food coordinator. It is a web-based application integrated with database [1]. It is developed using Symfony backend Bootstrap frontend. This main module contains sub-modules that can update, view, sending notifications. This web application always

synchronizing with database and all the details and operations done by through database.

C. Database

The server contains two main databases. They are the company database and the system database. Company database contains employees' details, administrative details, details about projects. Food-related data is stored in the system database. Databases are implemented using MySQL [7].

V. IMPLEMENTATION

A. Authentication

The user validation process will take place by calling the orange rim token-based Application program interface with the username and password. Employee and Food coordinator can be distinguished using their user Roles.

B. Ordering a food item

All the employees can order their preferred food items through the mobile application. All of the finalized orders are stored in the database. Orders can be placed from any internal or external provider.

C. Order management

Then the food coordinator can retrieve the order list using the web application. Food coordinator could obtain a classified summary of daily orders and can obtain monthly bills of an employee. Other than that system provides a graphical summary of trending providers based on the preferences of the employees.

D. Database

JavaScript Object Notation (JSON) [5] is used as the main method of transferring data among server, web application and, mobile applications. Since JSON is light weighted, transmission happens faster. System API receives all the requests and returns the response with the return type of JSON objects. Databases are updated regularly to ensure consistency and accuracy.

E. Administration module

Food coordinator has the permission to add menu items, add restaurants or delete menu items and delete restaurants or update menu items and to update restaurants from the database.

The system has the ability to generate a financial report about the employee orders to send them to the financial department.

F. Notifications

Food coordinator can notify the employees using the fire-based notification module in the web application. Additionally, food coordinator could send notify users regarding new food items, any other special events through this module.

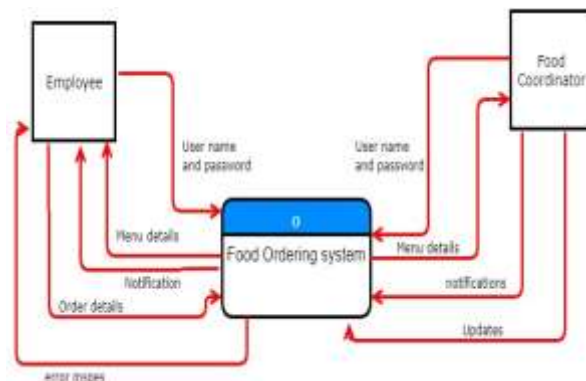


Figure 3: Context Diagram

VI. RESULTS

Mobile applications were developed targeting Android and iOS platforms. The web application was developed for the food coordinator. Users of the system can be categorized into employees of a particular company and the food coordinator of a particular company. Employees have the ability to select any food item and place them as an order. Food coordinator can manage, create, and edit any food item or any provider. Food coordinator could notify users when the orders have arrived and when a new food item is added or any other special event. The system is capable of generating financial reports based on employee orders. All the system features have been tested to be working.

VII. EVALUATION

This food ordering and management application were developed as a solution for issues that occur in organizations when ordering foods [9]. For the evaluation, two feedback forms were designed to assess the effectiveness of our solution. These forms were made to decide whether the expected services have been achieved. The first questionnaire was made for employees of an organization who are the users of mobile application and who does the ordering via application [2]. The second questionnaire was designed for the food coordinator who

manages and finalized all of the food orders of a particular Organization. Furthermore, those two users are the key users of provided service and that makes the requirement to analyze those feedbacks separately.

In order to assess the proposed solution by collecting information from more than forty different people as employees and food coordinators. Feedbacks were calculated and collected results to get the average rating for each functional and non-functional evaluation aspect. For each evaluation aspect, the average rating was calculated by adding marks given by each user and dividing it by a total number of responses.

If the average rating has laid between 5 and 4, the rating is considered between Excellent and good. If the average mark has laid between 4 and 3, the rating is considered between good and satisfactory. If the average marks have laid between 3 and 2, the rating is considered between satisfactory and poor. If the average marks are in the range of 2 and 1, the rating is considered between poor and very poor.

$$\text{Average Rating} = \frac{\text{Total Score}}{\text{No of responses}}$$

Evaluation aspects of users

- User friendliness of the android application.
- Compatibility of the app with different platforms
- Concept of the application.
- Responding speed of the application.
- Your interactivity of the system.
- The accuracy level of the results and service.
- Marketing and Business model for the system.
- Device condition when using this app (battery, performance speed).
- The usefulness of the application.

Evaluation aspects of food coordinators.

- User friendliness of the web interface.
- Concept of the system.
- Responding speed of the web application.
- Your interactivity with the system.
- The accuracy level of the order results.
- The business model for the software.
- The usefulness of the System.

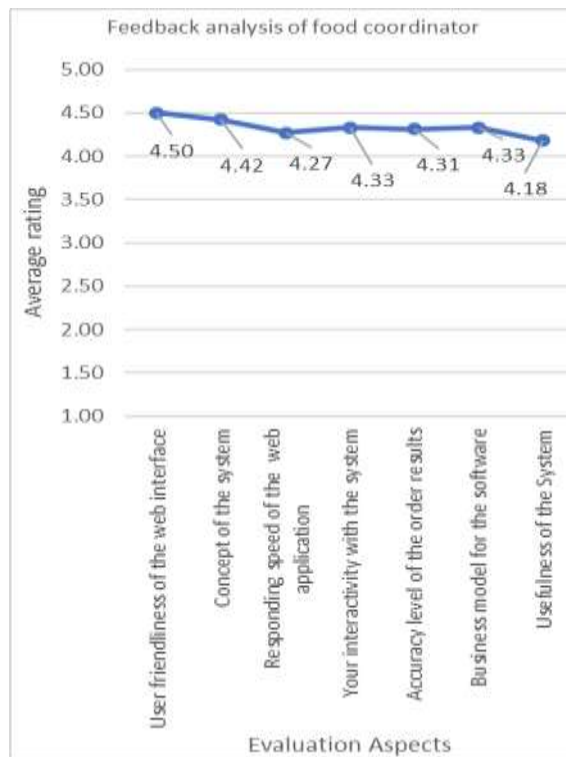


Figure 4: for the summary of feedback of administrative website

Above figure 4 chart shows the summary of the feedback analysis of the administrative website of the system. Feedback analysis of the administrative website was done with 7 evaluation aspects. As shown in the above chart user-friendliness of the interface has got the highest average rating of 4.50. The average rating of all evaluation aspects varies between 4.18 and 4.50. As shown in table 3 from all evaluation aspects overall satisfaction of the administrative website has reached an average rating of 4.33.

VeryGood[5]	Good [4]	Satisfactory [3]	Poor [2]	Very Poor [1]	Total score	No.of responses	Rating(2 decimal places)
135	56	12	0	0	203	45	4.50
100	96	3	0	0	199	45	4.42
100	68	24	0	0	192	45	4.27
110	64	21	0	0	195	45	4.33
90	92	12	0	0	194	45	4.31
80	112	3	0	0	195	45	4.33
100	72	6	10	0	188	45	4.18
715	560	81	10	0	1366	315	4.33

Table 3: Feedback analysis of the administrative website

Below figure 5 chart shows the summary of the feedback analysis of users' mobile applications of the system. Feedback analysis of the administrative website was done with 9 evaluation aspects. As shown in above user-friendliness of the applications has got the highest average rating of 4.36. The average rating of all evaluation aspects varies between 3.71 and 4.36. As shown in table 7.4 from all evaluation aspects overall satisfaction of the administrative website has reached an average rating of 4.04 which is standing between excellent and good.

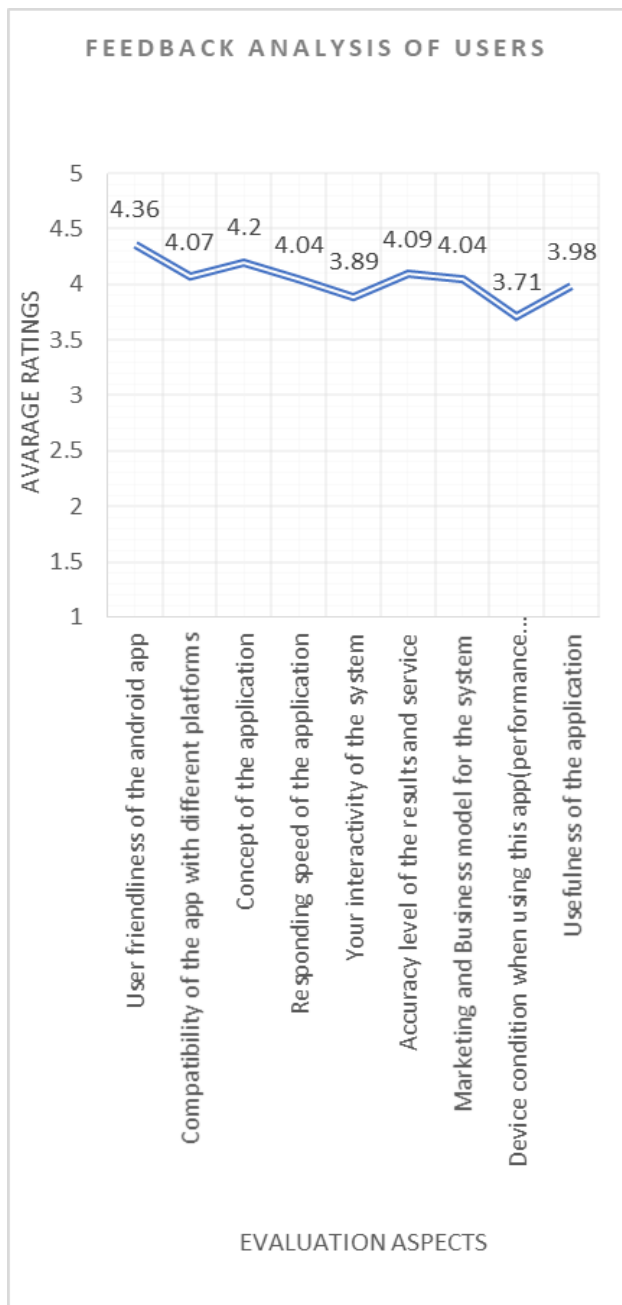


Figure 5: for the summary of feedback of using the mobile application.

Very Good [5]	Good [4]	Satisfactory [3]	Poor [2]	Very Poor [1]	Total score	No. of responses	Rating (2 decimal places)
100	84	12	0	0	196	45	4.36
50	112	21	0	0	183	45	4.07
80	88	21	0	0	189	45	4.2
65	92	21	4	0	182	45	4.04
45	88	42	0	0	175	45	3.89
60	100	24	0	0	184	45	4.09
65	92	21	4	0	182	45	4.04
35	80	51	0	1	167	45	3.71
70	76	27	6	0	179	45	3.98
570	812	240	14	1	1637	405	4.04

Table 4: Feedback analysis of mobile applications.

A- Limitations

However, a few limitations have been identified in the system. This system is functional only during office hours at the working place only. Additionally, this system does not provide any kind of delivery system. This system is operated in the English language which creates a limitation of unavailability of bilingual support [1].

VIII. CONCLUSION

Proposed food ordering and management system have brought a system which includes all the identified features of the existing system and the new feature itself. This system accelerates the daily food ordering process in a workplace which leads to reaching a high level of productivity of the workforce. Since the system is integrated using smart mobile phones it makes this system more usable for the people who are working in organizations and companies with hectic lifestyles. The goal of this research was to create a system to ease the food ordering process inside a company. Using a mobile application employee can place their daily food orders. Finally, were able to get the proposed system working properly and consistently. Comparison between our proposed application and similar existing software systems is given in Table 5.

XI. FURTHER WORK

The proposed system has developed web application and mobile applications according to the requirements of our client. It has developed two mobile applications for the Android and IOS platforms to ease the procedure of placing orders on food and beverage preferences of employees on a particular industrial organization to notify the logistic division about the daily requirement summary on food. For further improvements, this system can be improved by adding a health care assistant service module which can notify the users about meal time medicine times and nutrition level of selected menus. Moreover, Since Sri Lanka's native language is Sinhala it is better to add bilingual support both Sinhala and English [1].

Software systems Systems Characteristics	Food Panda	Foodie .lk	Zomato	Feedme.lk	WFO S	Our System
1.Online ordering.	✓	✓	✓	✓	✓	✓
2.Menu management		✓			✓	✓
3.Rating system.	✓	✓	✓	✓		✓
4.Easy to find restaurants	✓	✓	✓	✓		✓
5.Available in any country	✓		✓			✓
6.Platform compatibility	✓	✓	✓			✓
7.User notification system					✓	✓
8.Easy payment system	✓	✓		✓		✓
9.Both external & internal ordering facility						✓

Table 5: Comparison between our proposed system and similar existing software systems

ACKNOWLEDGEMENT

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