

Implementation of a Selection Sort Algorithm for FoodZone Catering System (FoCas)

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Abstract: Nowadays, many people using catering service for the event purpose. But it is difficult for some people to find the best catering that provide special type kind of food. The problem to find the best catering services is time consuming and making the right choices is difficult. Hence, FoodZone Catering System help the users to make a better choice to select appropriate caterers based on user requirement. This is a web-based system that allows users to find the best catering service pricing which is applied Selection Sorting Algorithm to perform this task. This algorithm not depends on the initial order of the data. Therefore, customers can choose catering menu and their price based on a list of catering services that appear according with inputs of various prices by the customers. Therefore, it is easier for customers to booking online and this can save the time, cost and appropriate information of caterers. In addition it also helps in solving the problems of the selection catering services based on their budget estimates.

Key words: Sorting Algorithm • Spiral Model • Catering • PhP • MySql

INTRODUCTION

Catering is the activity of providing food and beverage for events. A lot of companies and households in Malaysia need catering services for their events such as a corporate function, meeting, birthday, wedding or social party [1, 2]. There are few criteria need to be a concern in choosing the best caterings to serve special functions for their event. Customers tend to seek information about the particular catering from families, friends, pamphlets and advertisements. Sometimes, the customer takes the easiest way of finding information by using the internet. However, information and details about the catering provided on the internet are limited. If they need more information, they should contact the catering and this can cause wastage of time and cost. Therefore, FoodZone Catering System (FoCas) is proposed to help the customer to find the best catering for their event within their budget. The implementation of FoCas might help modern customers to find the catering service and make caterer easy to get the customer. Using FoCas system, the customers have an easier way to book catering provider because it is more comfortable as they can choose what type of the food, beverages and other facilities for their events. In addition, implementation of

FoCas system using Selection Sort Algorithm (SSA) give beneficial for searching the price that offered by caterers. An online system is believed to facilitate and upgrade the current manual system and brought a new level in enhancing the management system, besides creating a user-friendly interface for user ease.

The following paragraphs discuss about the previous researchers related to the domain and the SSA in their research. In [1], the authors exploit the Internet of things (IOT) to proposed automatic checkout and healthy diet catering system. The RFID tag is embedded a new type dishware and the system can mark the diet with ISO14443A air protocol and bind it to the consumer. Using this system the catering company cut for labour cost and customer waiting time and indirectly improves their service. The system also used simulated annealing algorithm as a result it is provides healthy dietary guidance and information for customers to manage daily diet.

Next, the researchers proposed to provide an analytical tool to select the best catering firm providing the most customer satisfaction discuss in [2]. Using questionnaires they interviewed the customers of three Turkish catering firms to obtain the most criteria while they selected the catering firms. Fuzzy analytic hierarchy

process was used to the system and then the means of triangular fuzzy numbers produced by the customers and experts for each comparison were successfully used in the pairwise comparison matrices and finally this tool improve customer consistency in decision making selection the best catering.

Furthermore, if viewed in terms of SSA algorithms, this algorithm an important operation in computer programming [3-4]. For any sequence of records or data itenhances the efficiency for record searching, insertion and deletion [3-4]. The authors in [5] compare the performance of two sorting algorithm namely SSAand Quick Sort algorithm. In their research, they compare the speed when sorting using integer and string array and the analysis of the result were recorded. The finding of resultshow the SSA performs better than Quick sort.Meanwhile in [6], the authors intended to visualize the selection sort algorithm for Algorithm and Programming course. Algorithm visualization illustrates in form of graphically how the algorithm works. In detail the algorithm visualizationcan be used to explain how all data move to the proper position in order tobe sorted in a display computer for education. The finding indicates that students increase their motivation and ability to program variety of sorting in programming language they learn.

The rest of the paper is organizedis as follow: System development, Selection Sort Algorithm (SSA), Context Diagram (CD) of FoCas and sample interfaces of FOCas provided in section Material and Methods. Results and discussion is described in the next section and the Conclusion of this research in the final section.

MATERIALS AND METHODS

This section explains the materials and methods that are usedFoCas. It is divided into two, firstly the Selection Sort Algorithm (SSA) and development of the system using incremental model.

System Development: The spiral model is applied for the system development process. This model aids in choosing the optimal process model and combines aspects of the incremental build model, waterfall model and prototyping model [7]. The several steps of this model depicted in Figure 1. Algorithms SSA is integrated in ‘prototype, development and software product design’ and testing for this system in ‘design validation and verification’ and combines with ‘unit test’, ‘integration test’ and ‘acceptance test’.

Selection Sort Algorithm (SSA): The selection sort algorithm (SSA) is simple and can easily be implemented as compared to others such as the merge or quick sorting [8, 9]. Using words, the SSA is partition into two (2) main parts, namely the sort part and unsorted part. For any iteration, the value take from the unsorted and then placed in the sorted list. This leads the size of sort partition grow while the unsorted partition shrinks for each iteration. When adding to the sorted list, the algorithm makes sure that the value is added at the right position to ensure an order sequence of the sorted partition. The process is terminated when the number of items or the size of the unsorted is one (1). The procedure to select a value to be

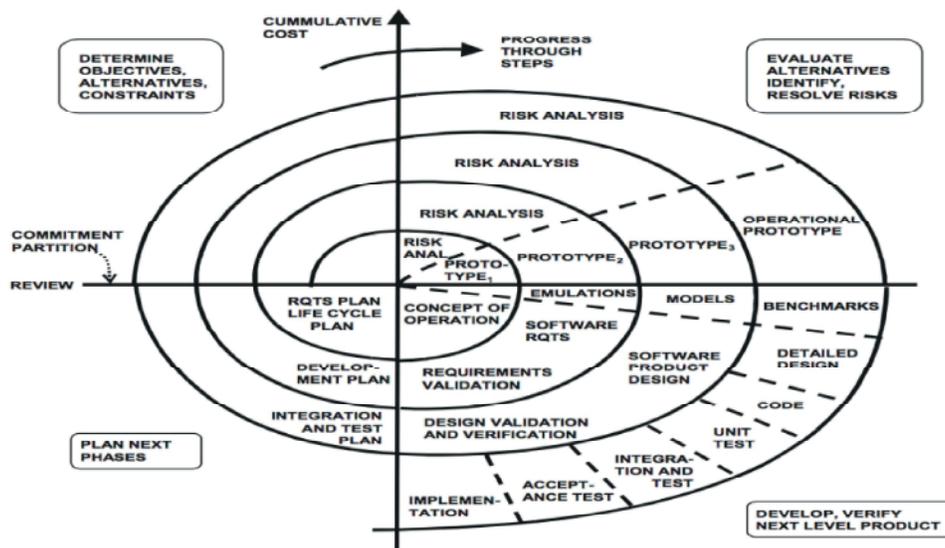


Fig. 1: The Spiral model for the software development process

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procedure selection sort
list : array of items
n : size of list
for i = 1 to n - 1
/* set current element as minimum*/
min = i
/* check the element to be minimum */
for j = i+1 to n
if list[j] < list[min] then
min = j;
end if
end for
/* swap the minimum element with the current element*/

if indexMin != i then

swap list[min] and list[i]
end if
    
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Fig. 3: Pseudo-Code

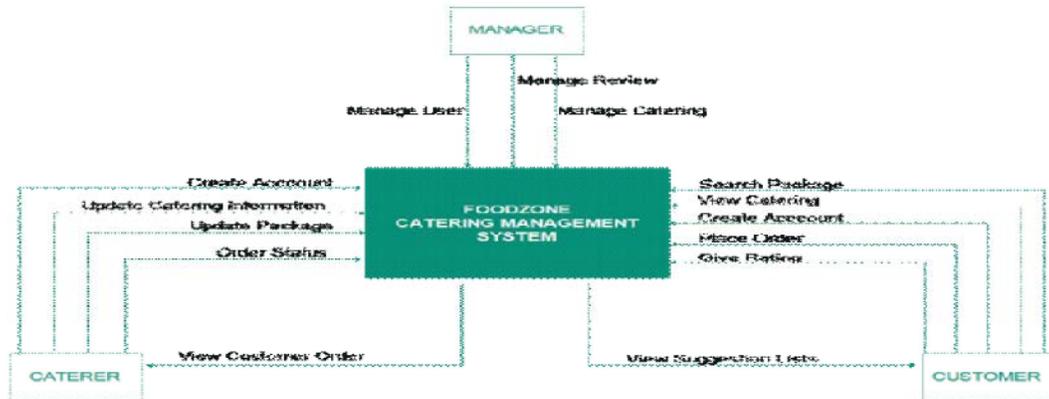


Fig. 4: Context Diagram for the FoCas

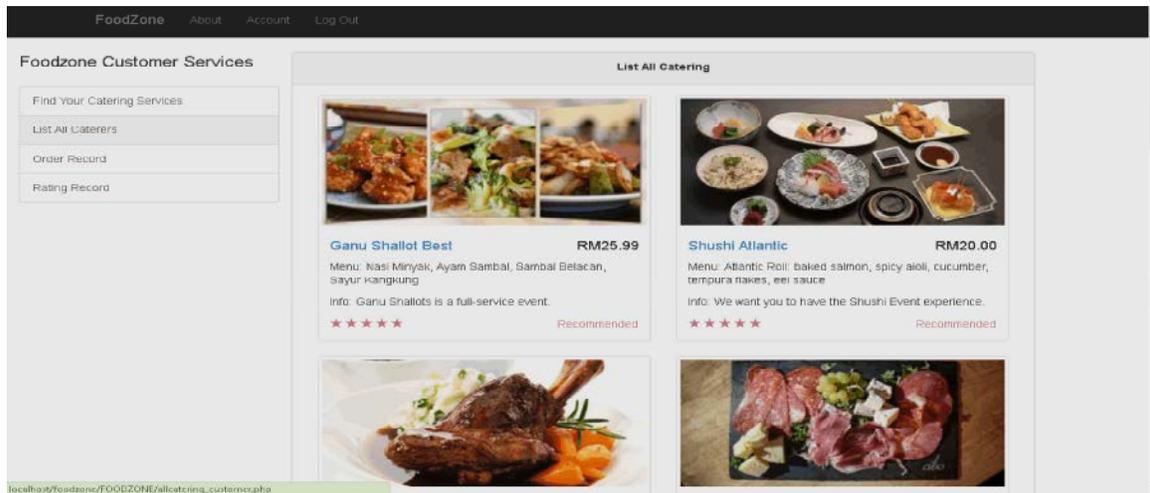


Fig. 5: List All Caterer Page

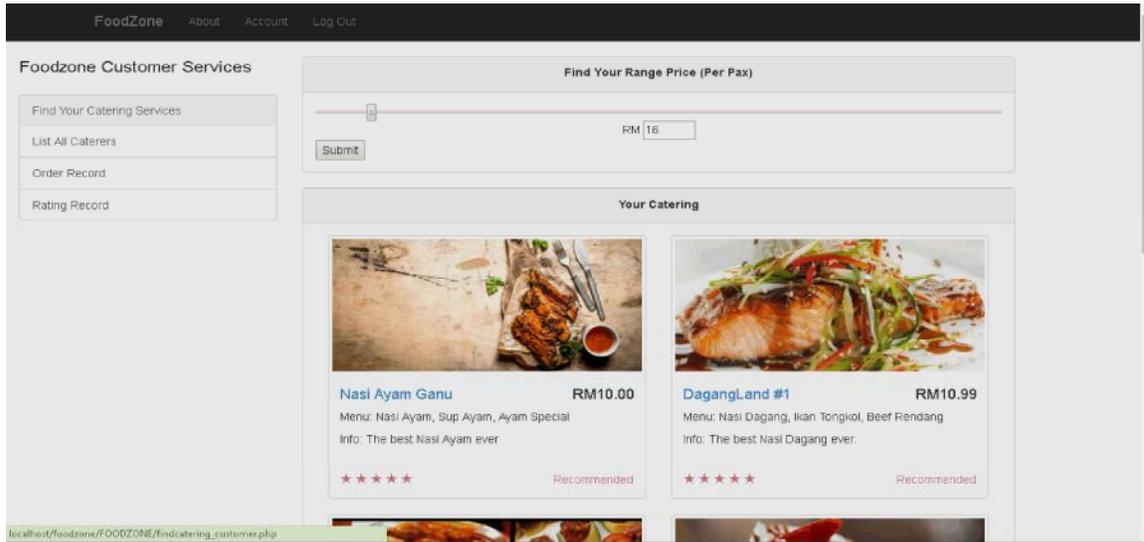


Fig. 6: Search Package (algorithms used)

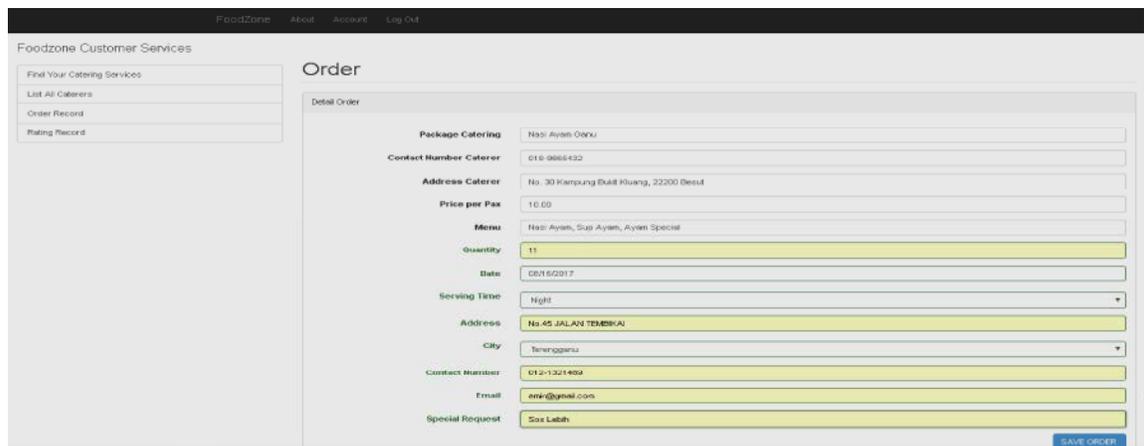


Fig. 7: Customer Order Page

moved to the sorted list will return minimum value or maximum value in the unsorted partition, which will be swapped to position the item correctly. The SSA pseudocode is shown in Figure 2 [8].

Context Diagram (CD) For FoCas: Figure 4 illustrates the CD for FoCas. The process is at the center of the diagram. The three entities (CATERER, MANAGER AND CUSTOMER) are placed around the central process. Fourteen data flows are involved in the interaction between the central process and the entities. The main process of CATERER such as Update Caterer Information, Update Package and Trace the Order meanwhile the CUSTOMER processes are Search Package (Using SSA) and Make Order and finally the MANAGER manages CUSTOMER and CATERER.

Interface of the FoCasSystem: The FoCas has been implemented using PHP and MySQL. This subsection presents an example of screen capture for the system. This is shown in Figure 5 to Figure 7.

RESULTS AND DISCUSSION

In this section, the discussions of the results are depending on the functionality of the system. For example, the GUI of the system is captured such as Figure 5 – Figure 7. Figure 5 represents the Listing all caterers page. Meanwhile, the SSA is applied to the Search Package Page such as Figure 6 and finally Figure 7 shows the page of Customer Order. To obtain the performance based on the functionality of the FoCas, several tests have been done. For example, in order to perform the performance test

Table 1: Test Case: Order Package

Step	Procedure	Expected Result
1	Customer Click Package http://localhost/FOODZONE/allcatering_customer.php	View Confirmation Order Page http://localhost/FOODZONE/orderconfirm.php?menuid=1
2	Customer Click Confirm http://localhost/FOODZONE/orderconfirm.php?menuid=1	View Order Page http://localhost/FOODZONE/orderadd.php?menuid=1
3	Customer enter the following details: Suggested Input: Quantity: 100 Date: 11/8/2017 Serving Time: Morning Address: no 13 Jalan Jerteh City: Terengganu Contact Number: 012-1321489 Email: amir@gmail.com Special Request: Sos Lebih	
4	Customer Click Save Order http://localhost/FOODZONE/orderadd.php?menuid=1	Update Successful View Order List http://localhost/FOODZONE/order_customer.php

Table 2: Test Case Failed: Order Package

Step	Procedure	Expected Result
1	Customer Click Package http://localhost/FOODZONE/allcatering_customer.php	View Confirmation Order Page http://localhost/FOODZONE/orderconfirm.php?menuid=1
2	Customer Click Back http://localhost/FOODZONE/orderconfirm.php?menuid=1	View All Catering Page http://localhost/FOODZONE/allcatering_customer.php
3	Customer enter the following details: Suggested Input: Quantity: Date: 11/8/2017 Serving Time: Morning Address: no 13 Jalan Jerteh City: Contact Number: 012-1321489 Email: Special Request: Sos Lebih	
3	Caterer Click Save Package http://localhost/FOODZONE/allcatering_customer.php	Popup Show Message: Please fill Out this field. http://localhost/FOODZONE/allcatering_customer.php

Case for Order Package Page such as in Table 1 and Table 2 Table 1 shows the success input by the customer Order Package Page meanwhile in Table 2 is input by the customer incorrectly or illegally.

CONCLUSIONS

Selection Sort Algorithm has been integrated for development FoodZone Catering system (FoCas). The system consists of several modules such as Customer module, Caterers Module and Manager (Admin) Module. By taking advantage of the widespread use of smartphone, computer devices and fast-paced Internet access, it allows and is easier for customers to search, booking and manage order efficiently. It makes customers convenience and at the same time save cost and time. For

the future, the new module will be implemented for decision making process to help the customers to find the Caterers based on customers' criteria.

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