

## Pantry Car Automated System

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**Abstract-- This paper is about the automation of pantry cars in Indian Railways. The manual ordering system relies on a lot of manpower to handle all the process from taking order from passengers till placing the order. Therefore this system is developed to reduce the manpower in ordering task and at the same time reduce the monthly cost for the Pantry car. Passengers can make their order through the developed system and this information can be directly stored in the database. The system is designed using Android and SQLite to give a better solution for the manual system.**

### I. INTRODUCTION

Railway pantry is inefficient to serve thousands of travelling people. The main aim of the project is to design a system to update presently used pantry system and make it automated. The system which is currently being used involves manually placing of orders which is time consuming and might lead to misplacements. Railway pantry system currently being used involves manually placing of orders. A man from pantry section takes orders from every berth (or passenger), he tells about the menu and accordingly as per the demand brings the order placed in some time and hence, vendors spend a lot of their time in taking the order from the passengers rather than the time required to serve them. This process is time consuming and might lead to misplacement of orders. There is a fix time duration within which that person comes and takes orders. Once we miss that time duration or if we need to place a new order, we personally have to go to the pantry section and place our order. Another major problem faced in this system are the factor i.e. the passengers have to wait for much more time than required because the limited no of waiters have to satisfy the demand of all passengers and due to human intervention, misplacements are likely to take place. To meet these requirements, in the railway pantry car management system, we propose reliable wireless communication using zig-bee between pantry unit and bogie's on high speed long route trains. This system has already been implemented in some hotels. Using this system one can place his/her order easily. But this system is not widely accepted as it can serve only limited number of people. Moreover, only one user can place his order at a time. This system is static in nature. A more advanced system than this one can be used in a dynamic environment which can be user-friendly and can handle more number of users at a time.

To overcome these problems and to avoid errors due to human intervention we introduce automated railway pantry system.

### II. EXISTING TRADITIONAL METHOD

In the current existing system, the pantry boy comes to every bogie at a fix time duration and narrates the menu verbally and makes a note of the placed order on the paper from every berth. This system is repeated in every coach, which is time consuming. Also in many trains, the pantry boy has to sit in every bogie unit, for a fix time duration, to receive the order from the passenger. Thus unnecessarily one pantry boy has to be seated in a particular bogie for the fix time duration, thus leading to many unnecessary labors than actually required in managing the pantry system. After taking the order, the pantry boy goes to pantry section and then the order is made which is served after 3-4 hours from the time of the placed order to the passenger.

Even after involving lots of labor and consuming many hours, this system gets involved in confusion regarding the placed order and their respective bills, which leads to the misplacement of order. Also, if the pantry boy comes late, the passenger left with no other option rather than waiting for the pantry boy to attain them. Also changing the price of an item on the menu card and adding a new item to the menu card is very tedious job. Many cases have been reported in which, fake pantry boy takes the order, cheat the passengers and take their money.

### III. Assumptions

- The details related to product, customer, payment and service transaction provided manually.
- Administrator is created on the system already.
- Roles and tasks are predefined

### Hardware and Software Specification Required

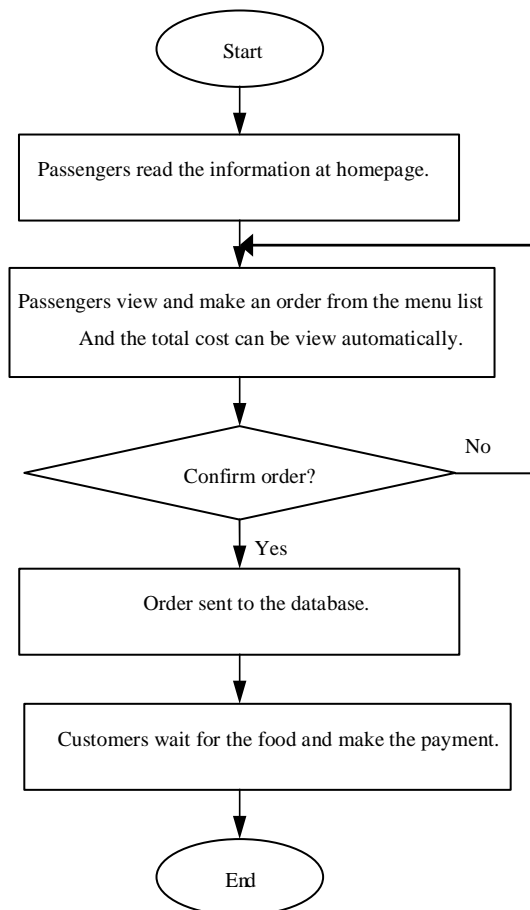
#### Hardware Specification

- A smart phone or a computer or a laptop
- Internet access
- RAM 312 MB or Higher

Software Specification

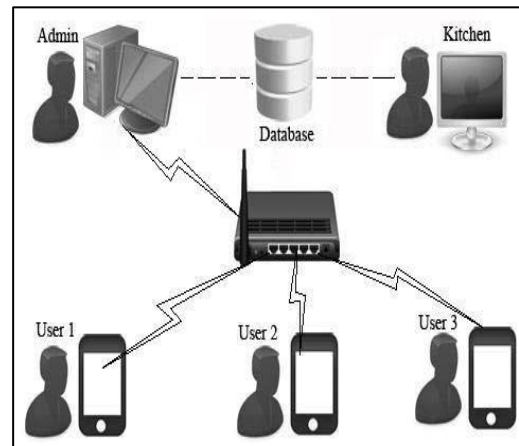
- Operating System : Unix, Linux, Mac, Windows etc.
- Development tool : PHP,Hypertext Preprocessor, JavaScript, Ajax
- Data Base : MySQL

**IV. Implementation**



The work flow to develop the Pantry Car Automated System is as shown in Figure 1. When the passenger enters the system, the home page of the system will be appearing. This page contains the information of the foods and the promotion price when available. Then, Passengers will navigate to the menu page to view the entire menu and then can proceed to make their order. They can simply add and remove their desired menu items and the total cost is automatically counted.

Though the payment is done on the delivery of the food. Also a person have to pay in cash to the deliverer. This reduce the time spent on collecting the orders also the guest can take time to think before placing an order



The Pantry Car Automated System functional correlation is shown in Figure 2. The connection between users and server is connected by the router through the LAN cable for a better connection. The order will be saved into the database in the admin computer. This order can also be viewed by the kitchen computer for the food preparation.

There are some analysis have been done to compare the Pantry car automation system with the manual system. The Table II and calculation below show the different in manpower cost and time for both methods.

**TABLE I. COMPARISON BETWEEN PCAS AND MANUAL SYSTEM COST AND TIME**

Analysis	PCAS	Manual	Reduce
Manpower cost	RM6400	RM8800	27.3%
Servicing time	20 minutes	27 minutes	29.5%

Table 1. Comparison between PCAS and manual system

**A. Cost for manpower**

One of the objectives of the system is to reduce the number of manpower since ordering process is replace by the system. From the observation, the average salary and number of workers is taken from the Pantry car.

Manual/Existing system

Cost	= Salary x No. of workers
Waiter	= RM1200 x 4 = RM4800
Chef	= RM2000 x 2 = RM4000
Total	= RM4800 + RM4000 = <b>RM8800</b>

**B. Pantry Car Automation System (PCAS)**

Cost	= Salary x No. of workers
Waiter	= RM1200 x 2 = RM2400
Chef	= RM2000 x 2 = RM4000
	= RM2400 + RM4000
Total	= <b>RM6400</b>

time	= 5 min Record menu
	= 2 min
Food preparation	= 15 min
<b>Total service time</b>	= 5 + 5 + 2 + 15 = <b>27 minutes</b>

Pantry Car Automation System (PCAS)

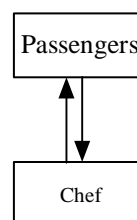


Figure 21. PCAS ordering system flow

The calculation below show the percentage of cost can be saved by the Railway. Large numbers reduction can give more profit to the Railway. So that owner of the Railway can use

This cost to upgrade the Pantry car to make the customer more comfortable or expense on promotion.

<b>Percentage of man power cost (%)</b>
= [(Manual – PCAS) / Manual] x 100%
= [(RM8800 – RM6400) / RM8800] x 100%
= [RM2400 / RM8800] x 100%
= <b>27.3%</b>

Waiting	= 0 min Order
time	= 5 min Record
	= 0 min
Food preparation	= 15 min
<b>Total service time</b>	= 5 + 0 + 0 + 15 = <b>20 minutes</b>

Figure 20 and 21 show the manual and PCAS ordering system flow. From the calculation for total service time, it is show a reduction of ordering time for PCAS compares to the manual ordering system. The different total service time between manual and PCAS ordering system is 7 minutes which is about 25.9%.

**C. Servicing Time**

Since the system are replacing a lot of task that done by the human before, so it is reduced a lot of times. The calculation below show the different of using time between existing system and PCAS for each order made. The data is the average time during peak time.

**Manual/Existing ordering system**

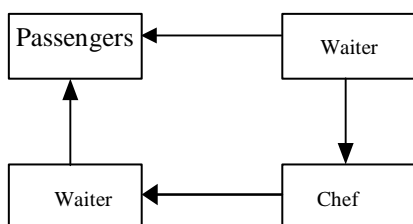


Figure 20. Manual ordering system flow

Waiting	= 5 min Order
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<b>Percentage of total service time (%)</b>
= [(Manual – SROS) / Manual] x 100%
= [(27 – 20) / 27] x 100%
= [7 / 27] x 100%
= <b>25.9%</b>

**V. Conclusion**

In this paper, the Self-Service Pantry Car Ordering System (PCAS) has been designed to replace the manual system. The system served a lot of benefit to both Passengers and Railways.

Android is chosen to develop this system since it is easily used to edit the graphical interface. Meanwhile SQLite is sufficient to accommodate storage and queries of data.

Since a lot of task is replace by the system, the owner of the railway can reduce the number of manpower and reduce the cost of monthly expenses. For passengers, the system will reduce the time waiting and misunderstanding can be reduced to minimal. This is really important thing during peak hour to make sure the Passengers satisfy with the service.

Some element can be added to the system in the future to make it more interactive and user friendly. One of the elements is to add the entertainment page such as games, movies or music.

The customer can used this application during food preparation and prevent from bored of waiting during peak hour. Another addition is the system can be connected with web based application.

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