An Automated System for MSRTC Bus Depot Management
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Abstract—In this paper, we model the ERP system which is designed for managing the work at bus depot. Enterprise Resource planning integrates management component across an organization. They typically aggregate accounting and finance, manufacturing, Human resource and other sections. In this system, the working is automated in different sections. Smart cards will be the unique identity of employee. Major sections will be managed and maintained efficiently on daily basis. Estimated arrival time will be caught and used very efficiently for making appropriate announcements. As there are number of functionalities introduced in proposed system lot of time and manpower will be saved.

Key words: MSRTC, Smart Cards, Duty Allocation, Tracking

I. INTRODUCTION

The Bus Depot System consists of number of section which consists of lot of manual work. number of employees works for a single depot. Employees are basically of two types: 1.drivers and conductors and 2. are the one who work in depot, maintains record. The work done is maintaining the attendance, calculating the hourly working, duty allocation and schedule preparation. The work involved in these sections is manual. It consumes more time for completion of a single task.

The basic task is the calculation of hours for which drivers and conductors have worked, which is allocation involves preparation of daily schedule for drivers and conductors, which assign duty to them. Different registers are required for storing the data. Searching in this case is a tedious task.

The tradition system involves manual work with pen and paper, so updation cannot be done frequently. Accurate bills and report generation is not possible in traditional system. The proposed system aims to overcome the disadvantages of traditional system. It introduces smart cards for driver and will be used for estimation of time of arrival.

Announcements will be made some time prior to the actual arrival of the bus which will reduce the waiting of the passenger. A text message will be sent after the duty allocation to the respective employee. This will reduce the efforts of employees.

II. EXISTING SYSTEM

In traditional system, conductor and driver are the main and basic components. There is number of sections in depot such as duty creation, duty allocation, pass section, payroll section, payment section, etc. In each of the section related data is stored, maintained and updated on daily basis.

Working of different sections in the depot is as follow: 1.Duty Creation: In this section various routes are assigned with a unique duty no. Each duty is identified by its duty no. This section considers the form 4(a) which is referred for creation of any particular duty. The basic form of created duty is given in table no.1.

<table>
<thead>
<tr>
<th>Sr.no</th>
<th>Fields</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Duty number</td>
<td>It is the unique id number for the duties.</td>
</tr>
<tr>
<td>2</td>
<td>Departure time</td>
<td>It specifies the time at which the bus will leave the depot</td>
</tr>
<tr>
<td>3</td>
<td>Arrival time</td>
<td>It specifies the time at which the bus will arrive at the depot</td>
</tr>
<tr>
<td>4</td>
<td>Spread hours</td>
<td>It is the total time for a duty</td>
</tr>
<tr>
<td>5</td>
<td>Staring hours</td>
<td>It is the time duration in hours for which the drivers and conductors are actually in the bus for their duty</td>
</tr>
<tr>
<td>6</td>
<td>Destination</td>
<td>The place where the bus is going</td>
</tr>
</tbody>
</table>

Table 1:
1) Duty allocation: For each duty, one conductor and one driver is assigned. Employees will be assigned with duty. Dynamic changes will be made to the duties assigned if required.
2) Pass section: A family pass is provided to each employee. Employee can use that pass twice in year according to his choice. The pass consists of employee id along with his family member name.
3) Payroll section: In this section T2A form is maintained. In this form daily attendance of employees along with their daily working hours and overtime details are maintained. The form details are filled up for each employee and at the month end these details will be send to the account department.
4) Payment Section: In this section employee payment is generated. To generate their monthly payment, details of the T2A form will be referenced. Payment will be calculated based upon the km hours and present days.

A. Proposed System:

Traditional system consists of lot of manual work. To complete work in each section large and heavy registers are used. So, lots of manpower and cost is required, and it is quite tedious and hectic to maintain those data manually on daily basis. To overcome the drawbacks of traditional system we proposed the system called “ERP System for Bus depot Management”.

Following fig. illustrates the working of proposed system and highlights the different modules.
B. Block Diagram:

Fig. 1: Block Diagram of Proposed System

1) Duty Creation Master:
In this section user have to maintain number of registers for creating duties and have to store those data. But a system or database can store large data in more efficient way as compared to humans. In proposed system we provide facility for storing large data in automated manner.

2) Duty Allocation Master:
As manual allocation is done so there is less space for updating data. For ex. If any particular employee is not able to come and in that case we have to assign that duty to new employee then we have to scratch the previous data and enter new data. But, complexity increases when we have to update data no of time for same duty. Similarly, employee has to go depot and check their duty daily for next day. In proposed system this drawbacks are overcome as we provide the message facility and automation. When employee get assign new duty then respective message and e-mail both will be provide to user with his duty no and date. And as the system is computerized one so there is no issue related to update. We update our data as many times we want.

3) Route and Tracking Master:
In traditional system there is no efficient facilities to track the position of bus and driver have to remember each routes for different duties. So, in this system we provide routes for different duties and with the help of those routes we can track the position of particular bus.

4) Announcement:
Controller makes announcement of bus after its arrival. Sometimes if he is busy in some other work or there is lot of crowd on platform due to which controller does not recognize presence of bus and bus is gone without announcement. Due to this, controller have to pay special attention for new bus arrival. To overcome this drawback in proposed system there is facility that prior announcement will be made before actual arrival of the bus.

5) Payroll:
In traditional system, to maintain employee details large registers are maintained. In that register employee’s daily duty details are maintained. And final report will be submitted to the account section. But if in case during manual entries calculations goes wrong then it will affect employee’s payment. Payroll employees have to maintain this register daily large number of employee. It is more prone to errors. In proposed system these drawbacks are overcome by providing automated entries and thereby reducing the chances of mistakes.

6) Pass Module:
Employee provide pass in paper format so, there comes issues like security and lost chances. Here, we provide pass in the digitized form i.e. smart card pass.

III. EXPECTED RESULTS

- In route module appropriate routes for different duties will be shown.
- In tracking module, the tentative position of the bus will be shown. The color of remaining stops will be different from the visited stops so that recent location of the bus can be known.
- In announcement module, announcement about the arrival of the bus will be made some time prior to actual arrival of that bus.
- In pass module employees will be provided with a digitized pass which is more convenient to use.
- In payroll module whatever the calculations are there should be made appropriately and respected reports should be generated. There should not be any inconsistencies in reports and payroll details.
- In duty allocation module, proper messages along with duty no and date will be provide to each employee. Dynamic updation should be reflected.
- Each and every report required in bus depot system should be generated in efficient and effective way.

IV. CONCLUSION

The system is expected to overcome the disadvantages of the traditional system. It will save the time and cost and will reduce manual work. It will also add interesting features to the system that will be helpful for the employees as well as passengers also.

V. ACKNOWLEDGMENT

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REFERENCES
