Original Research Article

DESIGN AND IMPLEMENTATION OF AUTOMATED FOOD-RATION MATERIAL DISTRIBUTION SYSTEM

ABSTRACT

The main aim of this project is to describe the process of developing an automated and competent model of maintenance system for ration distribution using Visual basic program. The prevailing ration distribution system in food industry has large irregularities in the system. This system is user friendly software and will give options to handle staff, stock, purchase, distribution, and center details without any confusion and streamlines the entire process to improve efficiency and productivity. This paper explains the system analysis, software specifications, system design, system testing and implementation of ration distribution system. It is a wonderful package for food corporation to maintain their database and its installation procedure is very easy and provides advanced performance. By using this system, a greater number of staffs can be handled without misperception. The system should generate appropriate reports like staff details, stock, purchase, center, and distribution details.

Keywords: [Ration distribution system, Employee management system, Visual basic, Structured Query Language, MS Access]

1. INTRODUCTION

This paper describes an automated and efficient model of maintenance system for ration distribution using Visual basic program. The prevailing ration distribution system in food industry has huge irregularities in the system. The existing ration distribution system in food industry is managed manually through traditional means of record keeping. Records maintained and updated are not centralized, No data security, manual data entry and alteration. Keeping these records is tough and insecure where the records can be damaged, modified and more prone for malpractice. The desired report generation is not possible and has to be carried out manually. Remaining materials records are not maintained, it has to be manually calculated and maintained. The limitations of the existing manual system are it need more man power to keep a track on the work flow, more paper work is involved, it takes lot of time to search the details, unable to keep a track on sales, requires more man power and time.

As an answer to the glitches involved in the present system, the present paper recommends an automated model to offer high transparency at all the phases of material distribution and optimizes the entire supply chain management process. This system is user friendly software. It will give options to handle staff, stock, purchase, distribution, and center details without any confusion and streamlines the entire process to improve efficiency and productivity. The proposed automated material distribution management system has overcome all these glitches where the data is fully protected and centralized, where the distribution occurs appropriately and the remaining materials can also be easily verified. Thus, keeping the data centralized and the interface made available to all the users makes it easy and reliable to all the stakeholders. Automated food material distribution software aids to maintain the accounts along with distribution in a details and clear picture. Helps easy flow of work. No paper work will be involved into the system; every aspect will be saved in the software clearly. All the activities are managed by a set of user interfaces that takes care of data management helping the users to easily carryout the tasks of food material distribution. The proposed system also provides in generation of reports based on different criteria.

1.1 LITERATURE REVIEW

The present automated food and ration material distribution system is comparable with previous works in the development of similar system. Aaditya et al., (2018) proposed an automated model of Public Distribution System by means of biometric based authentication and networking through a micro-controller and the system confirms the identification of the user with biometric and comprises automatic vending machines for disposal of food materials and online payment systems and it enables the scrutiny of the distribution of the food materials.Rita Ravindra Chaudhari (2018) developed an automated ration distribution system by via embedded system technology that substitutes the conventional ration card system by smart card. The finger print module is positioned in the system to check the exact user access and the power supply unit is made by solar power.

Srinivas et al., (2018) described an automated ration material distribution system constructed by Radio Frequency Identification (RFID) technology instead of conventional ration cards to obtain the ration materials which allows people to gather their allotment without the participation of middleman, thus abolishing corruption, and malpractice.Pranjal Pedwal and Shubhangi Borkar (2016) projected an automatic ration materials distribution created with GSM (Global System for Mobile) and RFID (Radio Frequency Identification) technology in its place of ration cards. To get the materials in ration shops necessity to show the RFID tag into the RFID reader, then the customer codes is checked by controller and details of expanses in the card. After getting materials, controller guide the information to government office and customer through GSM technology.Ravi et al., (2016) stated that the automated public ration distribution system intentions to substitute the labor-intensive work in public distribution system and old ration card is substituted by smart card which has QR code that transmits to the webpage of the shop and the essential items are selected and payment is completed and then the items are collected from the machine.

Pattanayak et al., (2019) proposed a comprehensive running and maintenance database management based on a Visual Basic 6.0 software program, which can store all relevant data related to parts, equipment, personnel, spares, failures, costs, and displays a warning message when the expected life of a particular component has been reached and it may decrease equipment failures rates, extend equipment life, and drastically reduce the overall operating costs. Monik et al., (2018) detailed an android and web-based application for canteen automation system which enables the end users to register online, read and select the food from e-menu card and order food online that will directly appear in the screen near the Chef who is going to cook the food. Manivannan et al., (2016) proposed an automatic ration shop system based on Aadhar card and controller for distributing the materials using GSM module in which user's finger print is used for matching authentication and after dispensing the materials the government head office receives the delivery Report from the PC with the help of GSM.

2. METHODOLOGY

2.1. SOFTWARE SPECIFICATIONS

2.1.1 Visual Basic

Visual Basic (VB) is an object-oriented language and development environment created by Microsoft in 1991. It has evolved from the earlier version of 'BASIC' language, which stands for 'Beginners All-purpose Symbolic Instruction Code.' Under the VB programming framework, software developers can use GUI-based features to alter sections of code by dragging and dropping objects. It allows programmers to define the behavior, function, and appearance of different objects by using graphical elements. Owing to the flexibility of VB, front-end and full-stack developers use it to design customized applications that show cross-platform support. It is also a go-to choose for developing applications that rely on forms, selections, and user inputs. Moreover, VB is also used to develop console applications that run through the command line instead of GUI.

2.1.2 Microsoft Access

Principally, a database comprises of one or more large complex files that stockpile data in a structured format. The database engine Microsoft Access, manages the file or files and the data within the files. A Microsoft Access database file, which has an extension of mdb, contains tables, queries, forms, reports, pages, macros, and modules, which are referred to as database objects. Even if there is large information in one large file, Microsoft Access manages this data pretty well. Forms, reports, pages, macros, and modules are generally concerned with letting users work with and display data. You will be writing Visual Basic applications to do this, so the only database objects you're really concerned about at the moment are tables and queries.

2.1.3 SQL - Structured Query Language

Structured Query Language (SQL) is a database language intended for managing data held in a interactive database management system. SQL was primarily developed by IBM in the early 1970s (Date 1986). The preliminary version, called SEQUEL (Structured English Query Language), was intended to manipulate and retrieve data stored in IBM's quasi-relational database management system, System R. Then in the late 1970s, Relational Software Inc., which is now Oracle Corporation, introduced the first commercially available implementation of SQL, Oracle V2 for VAX computers. Many of the presently available relational DBMSs, such as Oracle Database, Microsoft SQL Server, MySQL, IBM DB2, IBM Informix and Microsoft Access, use SQL.

In a DBMS, the SQL database language is used to:

- Create the database and table structures
- Perform basic data management chores (add, delete and modify)
- Perform complex queries to transform raw data into useful information

2.2 DESIGN AND IMPLEMENTATION

2.2.1 SYSTEM DESCRIPTION

The whole project is divided into five main modules. They are

- Staff Details
- Stock Details
- Purchase Details
- Centre Details
- Product Distribution
- Reports

Via this module we can add all the staff details into the staff table. Here staffs are classified by their designation wise. We can also do all the operations like edit, delete via this module. By using this module, we enter all the item names into table stock. Here the items are identified by unique number called product identification number. It is generated and assigned by the system. The items are entered by model wise. By using this module, we can enter all the purchase information into the purchase table. The distribution Centre information is entered into center table via this module. By using this module, we enter our distribution details in to distribution table. Here the distribution amount is maintained by center wise. By using this table, we can get the item supply information to every center by date wise and also get the information of the total purchase amount of individual center and overall. In reports, the following options are there, Staff: We get the staff details in report format; Stock: We get the stock details by model wise in report format; Purchase: We can get the purchase

information by date and product wise; Center: we get center information in report format; and Sales: we get the sales information by dealer wise in report format

2.3 DATABASE TABLE DESIGN - DATABASE NAME: FOOD

Table 1Database design for Staff

Fields Name	Data Type
Sdesig	Text
Sid	Double
Sname	Text
Sadd	Text
Ooj salary	Date
Sadd	Double

Table 2 :Database design forStock

Fields Name	Data Type
lid	Double
Iname	Text
Imod	Text
Qty	Double
Price	Double

Table 3Database design forCentre

Fields Name	Data Type
scadd	Text
scname	Text

Table 4Database design forPurchase

Fields Name	Data Type
Sdate	Date

Pid	Double
Pname	Text
Pmod	Text
Price	Double
Qty	Double
Namt	Double

Table 5Database design forDistribution

Fields Name	**Data Type**
Sdate	Date
Pid	Double
Pname	Text
Pmod	Text
Price	Double
Qty	Double
Namt	Double
Dname	Text
Dadd	Text

3. RESULTS AND DISCUSSION

3.1 SOFTWARE TESTING

Testing is vivacious to the victory of the system. System testing makes a logical assumption that if all the parts of the system are correct, the goal will be positively accomplished. Non - testing leads to errors. This creates two problems. The time lag between the cause and appearance of the problem. The effect of system errors on files and records within the system. Additional motive for testing is its efficacy as a user - oriented vehicle before implementation. The various types of testing carried out are 1. Program Testing, 2. System Testing, 3. System Documentation and 4. User Acceptance.

3.2 IMPLEMENTATION

The working of the project can be summarized as follows,

i. We load all the staffs' details by their designation wise into staff table via staff module.
ii. All the stock items are entered into table stock by model wise. Here each item is identified by unique number called product identification number.
iii. It is automatically generated and assigned by the system.
iv. The center information is entered into center table by center module. This information is retrieve on the time of distribution entry.
v. By using distribution module enter the details into distribution table and make quantity deductions in stock table. Here the distribution amount is maintains by dealer wise.
vi. At the time of distribution entry the system check the quantity with stock table concurrently.
vii. If the distribution quantity is greater than available stock, they it refuses the entry and show the error message.
viii. From report we get the staff details, stock, purchase, center and distribution in report form.
ix. We can get the overall distribution total and the individual center distribution total amount by center wise.

4. CONCLUSION

Material distribution system for Food Corporation is a wonderful package for corporation to maintain their database and it fulfills all the needs of the users. This system installation procedure is very easy and it is user-friendly software. It provides advanced performance. By using this system, we can handle a greater number of staffs by their designation wise and can handle any number items without confusion. The system should generate appropriate reports like staff details, stock, purchase, center and distribution details. We can get the distribution total by center wise and overall. Advantages of proposed Material distribution system for Food Corporation are it automates the management of data related to food materials distribution, it helps in the generation on report-based quires, it provides the reports based on diverse conditions, assure on time deliveries, no man power required to maintain the data of sales, distribution, and storages. Automated food materials distribution system helps to maintain the accounts, sales details and to make emergency deliveries when required.

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