

Grocery Store Management System

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Abstract

A Grocery store management system helps the Grocery shops to streamline all the store operations well and run the business without any hassle. With a POS software for a Grocery store, you can offer the best customer experience, increase your customer retention rates and attract more customers. You may use it to keep expenses in check, boost sales, and make customers happier. Optimal inventory levels, reduced costs, and continued competitiveness in the dynamic grocery retail market are all possible outcomes of an investment in an inventory management system. A Grocery software is a fast, reliable, and one-stop solution that facilitates easy and efficient operations by automating with the help of technology. The Grocery stores can manage all their store operations in a single software which includes Sales, Purchase, Inventory, Accounting, CRM, Loyalty, and many more. Thus, the basic functions, to manage a store, carried out are:1. Receiving of incoming consignments (goods) 2. Safe keeping of goods (Custody)3. Disposal of undesirable goods.4. Inventory Management.5. Housekeeping and record maintenance.

Keywords: Grocery Store Management, House Keeping, Inventory Management, Accounting.

Introduction

As a general rule, a supermarket will have sections for meat, fresh vegetables, dairy, and baked goods in addition to sections for canned and packaged goods, pet supplies, cleaning supplies, pharmaceuticals, and a host of other non-food items [1]. A grocery store, in its most basic definition, is a retail establishment that sells food items in bulk, including fresh produce, meat, poultry, canned goods, and frozen meals.

Successfully managing a grocery store entails a great deal of responsibility, regardless of whether it is a small, independently owned store or part of a bigger chain [2]. It is the responsibility of the grocery shop manager to keep the business running efficiently, provide competitive pricing, and guarantee customer satisfaction. For a manager who is serious about running a successful grocery shop, it is essential to have a solid grasp of the fundamentals.

Everything that has to be done to run a grocery shop efficiently is done via a system called a grocery store management system [3]. Data management pertaining to the many products, employees, supervisors, clients, invoices, etc., is a part of these facets. An effective method of managing data related to grocery stores is offered by this system.

A grocery store management system is a software application that helps grocery store owners manage their business operations [4]. The system requirements for a grocery shop management system may vary depending on the specific needs of the business. However, some common requirements included

- A computer with a minimum of 2 GB of RAM
- A hard drive with at least 500 GB of storage space
- A monitor with a minimum resolution of 1024 x 768 pixels
- A printer for printing receipts and invoices
- An internet connection for online orders and inventory management

These are just some of the basic requirements for a grocery shop management system [5]. The specific requirements may vary depending on the size and complexity of the business.

Literature Review

Li and Sun [6] suggests a tool to determine the stock level of grocery store products, particularly food items, so that managers can respond to sales and avoid having an excess of inventory. Convolutional neural networks are used in YOLOv5, the main computer vision technology used in the application. The objects in a photo are automatically identified and tallied by the model. We evaluated the accuracy and speed of our computer vision model using a large number of images taken from grocery shelves. The results demonstrate that the application is a helpful tool for users to record supermarket stock information since, even with a minor loss in item detection precision, the computer vision model can reliably produce a count for well-taken pictures.

Yang et al [7] This paper presents the results of a qualitative study that aimed to examine the waste management practices of UK retailers and build strategies for supply chain collaboration in order to prevent waste. The study used secondary data from the four largest UK supermarkets and twelve in-depth interviews with high-level SC managers at one of those supermarkets. The outcomes show that SC collaboration on waste management should focus on forecasting, managing product ranges, modifying case sizes, measuring performance, information systems, and multi-stakeholder communication. The study's authors concluded that retailers might benefit from better social and institutional coordination with SC partners and other interested parties.

Houghtaling et al [8] The protocol PRISMA was applied. Six databases were searched using an approach that included published papers from 1980 to 2017 in order to find pertinent publications that discussed the viewpoint of US food store retailers. The factors that influence retailer decision-making were captured using a social-ecological model, and the store-level perspectives on applied (or prospective) strategies were examined using a marketing-mix and choice-architecture framework. The two authors used pre-designed constructs to extract, arrange, and decide upon the data. Checklists with quality standards for both qualitative and quantitative research were used to evaluate the study's quality.

Ansari et al [9] Customers may now get anything they need from the comfort of their own homes at any time, eliminating the need for them to go visit their neighbourhood grocery shop. It is quick, easy to use, and adaptable. The B2C business model is the foundation of the online grocery store. The ability to see and order groceries online, register, log in, and conduct secure transactions are all offered to the customer. Customers are also welcome to

provide comments and feedback on any and all products. PHP and HTML/CSS are used to create the basic structure of web pages. Information about customers and vendors (sellers) is stored in MySQL.

Inba et al [10] Making ensuring vendors and customers are satisfied is an online store's primary goal. Customers can now find new online retailers instead of being limited to the restaurants, super markets, pharmacies, and other establishments near their home or ones that exclusively draw locals. One of the biggest benefits for the industry is that it connects new customers with online shops while also encouraging existing customers to explore new places and become a little more curious. We have a wide range of online ordering applications these days. However, there are only one or two food categories on the online ordering app. We've put in place an online ordering software that lets users order from a variety of categories on the same platform, including groceries, food, medications, and fruits and vegetables.

Proposed System

LS Nav Software

LS Nav (formerly known as LS Retail): LS Nav is a comprehensive retail management system that covers various aspects of grocery store operations, including point of sale (POS), inventory management, purchasing, sales analysis, and customer loyalty programs. LS Nav was a popular software solution developed by LS Retail, a leading software provider for the retail and hospitality industries. LS Nav is an all-in-one business management system designed to handle various aspects of retail and hospitality operations.

Key Features of LS Nav Typically Included

1. **Point of Sale (POS):** LS Nav offers a comprehensive POS system that enables retailers to process transactions, manage inventory, and handle customer interactions efficiently.
2. **Inventory Management:** The software provides tools for tracking and managing inventory across multiple locations, helping businesses optimize stock levels and minimize stockouts.
3. **Customer Management:** LS Nav includes features to manage customer information, loyalty programs, and customer-specific promotions to enhance customer engagement and retention.
4. **Retail Analytics and Reporting:** The system offers reporting and analytics tools that provide insights into sales performance, inventory trends, and other key performance indicators.
5. **Integration with ERP Systems:** LS Nav is often integrated with various Enterprise Resource Planning (ERP) systems, allowing for seamless data synchronization and centralized management.
6. **Multi-channel Capabilities:** The software supports various sales channels, including brick-and-mortar stores, e-commerce websites, and mobile apps, enabling retailers to offer an omnichannel experience.
7. **Hospitality Functionality:** For businesses in the hospitality industry, LS Nav can handle table management, kitchen order processing, and other restaurant-specific functionalities.

System Design for Grocery Management System

Table 1: Entity Order

Product details	Explanation
Primary Key Order-id:	This is system generated and unique, which can be referenced in any other entity.
items id	Reference to the item id is given here.
No of items	Total no of items for order.
Quantity	Quantity per item.
Price per item	Price of each item is given.
Discount	Any discount if offered will be paid here.
Total	Total of all costs is given here.

Table 2: Entity Item

Item details	Explanation
Primary Key item-id:	This is system generated and unique, which can be referenced in any other entity.
Rice id	Reference to the Rice id is given here.
Wheat- id	Reference to the Wheat id is given here.
others- id	Reference to the other type of item's id is given here.
Soap id	Reference to the item id is given here.
Cereals- id	Reference to the cereal's id is given here.

Table 3: Entity Soap

Soap Details	Explanation
Primary Key Soap-id:	This is system generated and unique, which can be referenced in any other entity.
Name	Name of the soap is here.
Type	Type of the soap for washing clothes or bathing.
size	The size of the soap is small, large.
Brand	The brand of the soap.
Price	The cost of the soap.
color	The color of the soap.
Rack No	The rack in which it is kept.
Fragrance:	The scent of the soap as it is.

Table 4: Entity Rice

Rice Details	Explanation
Primary Key Rice-id:	This is system generated and unique, which can be referenced in any other entity.
Type:	The kind of it is mentioned.
Size	The size of the rice is small, large.
Brand	The name to which it belongs.
Price	The price of the item.
Color	Color of the item.
Rack No	To which rack it is put.
Condition of Packing	Is the item packed or not depending?

Table 5: Entity Cereals

Cereals Detail	Explanation
Primary Key cereals-id:	This is system generated and unique, which can be referenced in any other entity.
Type:	The kind of it is mentioned.
Size	The size of the soap is small, large.
Brand	The name to which it belongs
Price	The price of the item.
Color	Color of the item.
Rack No	To which rack it is put.
Condition of packing	Is the item packed or not depending?

Table 6: Entity Others

Others Details	Explanation
Primary Key others-id	This is system generated and unique, which can be referenced in any other entity.
Used For	Where the item is used is given here the purpose.
Type	The kind of it is mentioned.
Size	The size of the soap is small, large.
Brand	The name to which it belongs.
Price	The price of the item.
Color	Color of the item.
Rack No	In which rack the products should be placed.
Condition of packing	Is the item packed or not depending?

Table 7: Entity Payment

Payment Details	Explanation
Primary Key Payment-id	This is system generated and unique, which can be referenced in any other entity.
User-id	This is a reference key from the other entity to link the data of that table. It is a system generated unique identity number. This used to uniquely identify every table in the database and perform the crud operation on it.
Ticket-id	This is a reference key from the other entity to link the data of that table. It is a system generated unique identity number. This used to uniquely identify every table in the database and perform the crud operation on it.
Status	Whether the payment is done or not is given here.

Table 8: Entity Staff

Staff Details	Explanation
Primary Key Staff-id	This is system generated and unique, which can be referenced in any other entity.
Staff name	The team's name is taken from the user and fed into this it is properly validated so that no mistake happens.
Qualification	The requirement is to filter the events according to this so that the user does not need to filter out the events to register. It makes this system more reliable and useful.
Number	The phone number is taken here to keep the member updated and the confirmation of the event is also managed through this method.
Email	Email is made to make members aware of new offers, new events, and for future reference, it is also relevant.
Type	The kind of user is mentioned here like he is a student, teacher or he is the vendor of any shop. According to this data, the discounts offered and other things are decided plus a few other things of adjusting the task of the user also with this.
Address	The location of the user is also mentioned here to make it accessible to the delivery and few other things too.
Starting rack	From where his duty starts on racks.
Finishing rack	Till where he gives responsibility.

Entity User

User data has to be saved in this entity, and all fields are required for this purpose which is taken from the user.

Table 9: Proper Validation is Checked, and the Attributes are as Follows

User Details	Explanation
Primary Key User-id	This is system generated and unique, which can be referenced in any other entity.
Username	Username is taken from the user and fed into this it is properly validated so that no mistake happens.
Qualification	The requirement is made to filter the events according to this so that the user does not need to filter out the events to register; it makes this system more reliable and useful.
Number	The phone number is taken here to keep the member updated and the confirmation of the event is also managed through this method.
Email	Email is made to make members aware of new offers, new events, and for future reference, it is also relevant.
Type	The kind of user is mentioned here like he is a student, teacher or he is the vendor of any shop. According to this data, the discounts offered and other things are decided plus a few other things of adjusting the task of the user also with this.
Address	The location of the user is also mentioned here to make it accessible to the delivery and few other things too.

System Installation

LS Nav is a popular retail management software that integrates with Microsoft Dynamics NAV (now known as Microsoft Dynamics 365 Business Central).

Please note that software installation procedures can vary over time, so it's essential to check the official LS Nav documentation or contact their support for the most up-to-date installation instructions. However, I can provide you with general steps to guide you through the process:

System Requirements Check

Ensure that your system meets the minimum requirements to run LS Nav. This may include hardware specifications, operating system compatibility, and software prerequisites like Microsoft Dynamics NAV/Business Central.

Obtain the Software

Purchase or obtain the LS Nav software package from an authorized vendor or LS Retail. They will provide you with the necessary installation files and license information.

Prepare the Environment

Set up the required infrastructure and prerequisites for LS Nav. This typically includes installing Microsoft Dynamics NAV or Business Central and any additional components or extensions necessary to run LSNav.

Backup Your Data

Before installing any new software, it's crucial to back up your existing data to prevent data loss in case of any issues during installation.

Install LS Nav

Follow the installation wizard provided by LS Nav or the installation instructions from their documentation. The steps usually involve running an installer and configuring various settings based on your business requirements.

License Activation

Activate your LS Nav license using the provided license information during the installation process. This step is essential to ensure that the software is legally registered and fully functional.

Configuration

After installation, you will likely need to configure LS Nav to align with your retail business's specific needs. This involves setting up store locations, items, prices, payment methods, tax rates, and other relevant data.

User Training

Once the software is installed and configured, provide training to your staff on how to use LS Nav effectively for daily retail operations.

Testing

Thoroughly test the system to ensure that everything is functioning as expected and that it meets your business requirements.

Go-Live

Once testing is successful, you can roll out LS Nav for live operations in your retail stores.

GoFrugal

GoFrugal is a software company that provides various business management solutions, primarily catering to small and medium-sized enterprises (SMEs). Their software offerings cover a wide range of industries, including retail, restaurant, distribution, and more. Some of the key features and functionalities of GoFrugal software may include:

- Point of Sale (POS) systems: GoFrugal offers POS solutions that help businesses manage sales, inventory, and customer information at the retail level.
- Inventory Management: GoFrugal's software assists in tracking and managing inventory, enabling businesses to optimize stock levels and improve efficiency.
- Accounting and Finance: The software may have basic accounting and financial management features, such as invoicing, expense tracking, and reporting.
- Customer Relationship Management (CRM): GoFrugal might include tools to manage customer data, loyalty programs, and marketing campaigns.

LS Nav

LS Nav, now known as LS Central, is a specific product offered by LS Retail, a software company specializing in Point of Sale (POS) and Enterprise Resource Planning (ERP) solutions for the retail and hospitality industries. LS Nav is particularly designed for businesses operating in the retail and restaurant sectors. Some key features of LS Nav may include:

Unified Retail Management: LS Nav integrates POS and ERP functionalities into a single system, enabling seamless management of sales, inventory, and financial data.

GoFrugal vs LS Nav

"GoFrugal" and "LS Nav" are two different types of software, each serving specific purposes in the business world. Here's a brief overview of each:

Inventory and Supply Chain Management: LS Nav helps businesses optimize inventory levels, handle supplier relationships, and track goodsthroughout the supply chain.

Multi-Channel Sales: LS Nav supports businesses that operate both brick-and-mortar stores and online sales channels, allowing for unifiedmanagement and reporting.

Customer Loyalty and Marketing: The software may have tools tomanage customer data, loyalty programs, and marketing efforts to enhance customer engagement

Results And Discussion

Modules of Grocery Store Management System

The Grocery management system module is composed of interconnected modules that facilitate the scheme's primary objective through mutually beneficial collaboration.

Item Selection

Fig 1 represent that you may add as many goods as you like, specify them as you wish, and then get them done all in the interface. You can choose them based on several filters including price, colour, category, and much more.

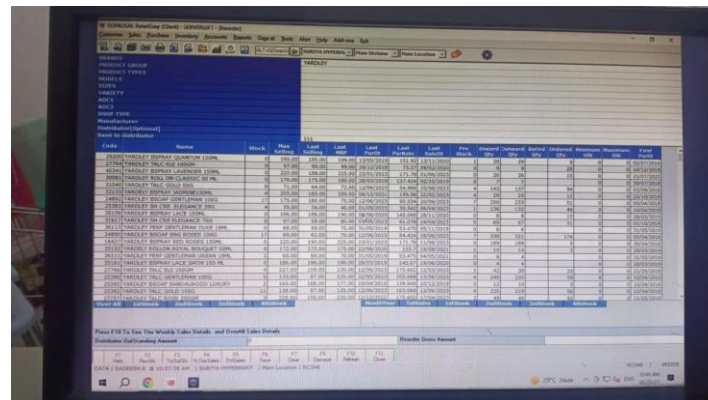


Fig. 1: Item Selection

Orders

After selecting, the user can see the final result in the order interface, where he can also see the specifics of the total and the ordering timeframes. Anything he wants can be taken away illustrated in Fig 2.

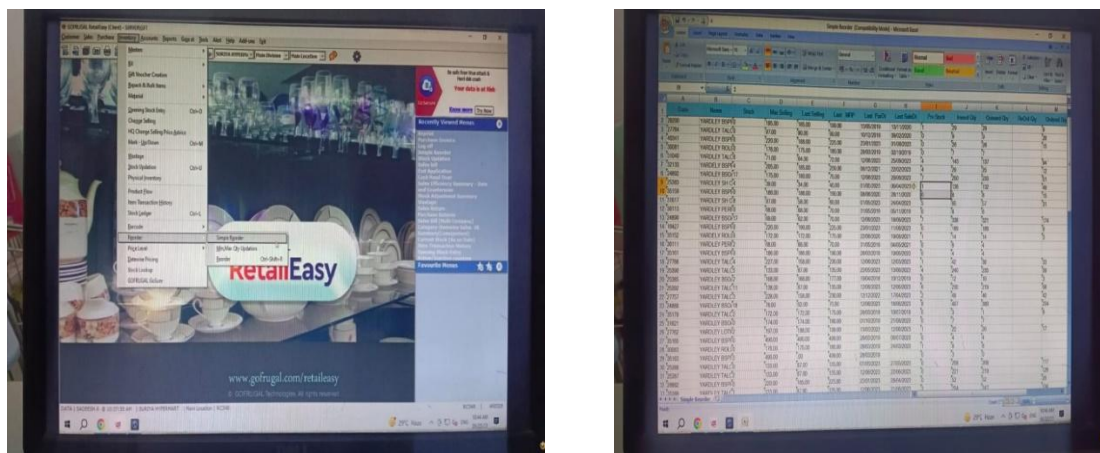


Fig. 2: Orders Placed

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