

# **Online Grocery Store**

**Diploma in Software Engineering**

**Final Project Documentation**

**23.3F**



**School of Computing and Engineering**  
**National Institute of Business Management**  
**Colombo-7**

Project Title: **Online Grocery Store for NATO mini mart (Pvt) Ltd.**

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## **Chapter 1 : Introduction**

### **1.1 Introduction of the organization**

NATO mini mart is a retail grocery store located in Wadduwa that was established in 1999 by P.C.Fernando . NATO mini mart mainly provides a selection of day-to-day grocery items, food items, fresh meats and delicious chocolates.

Over the years, NATO mini mart has been the local source for fresh produce, quality meats and a wide range of everyday essentials.

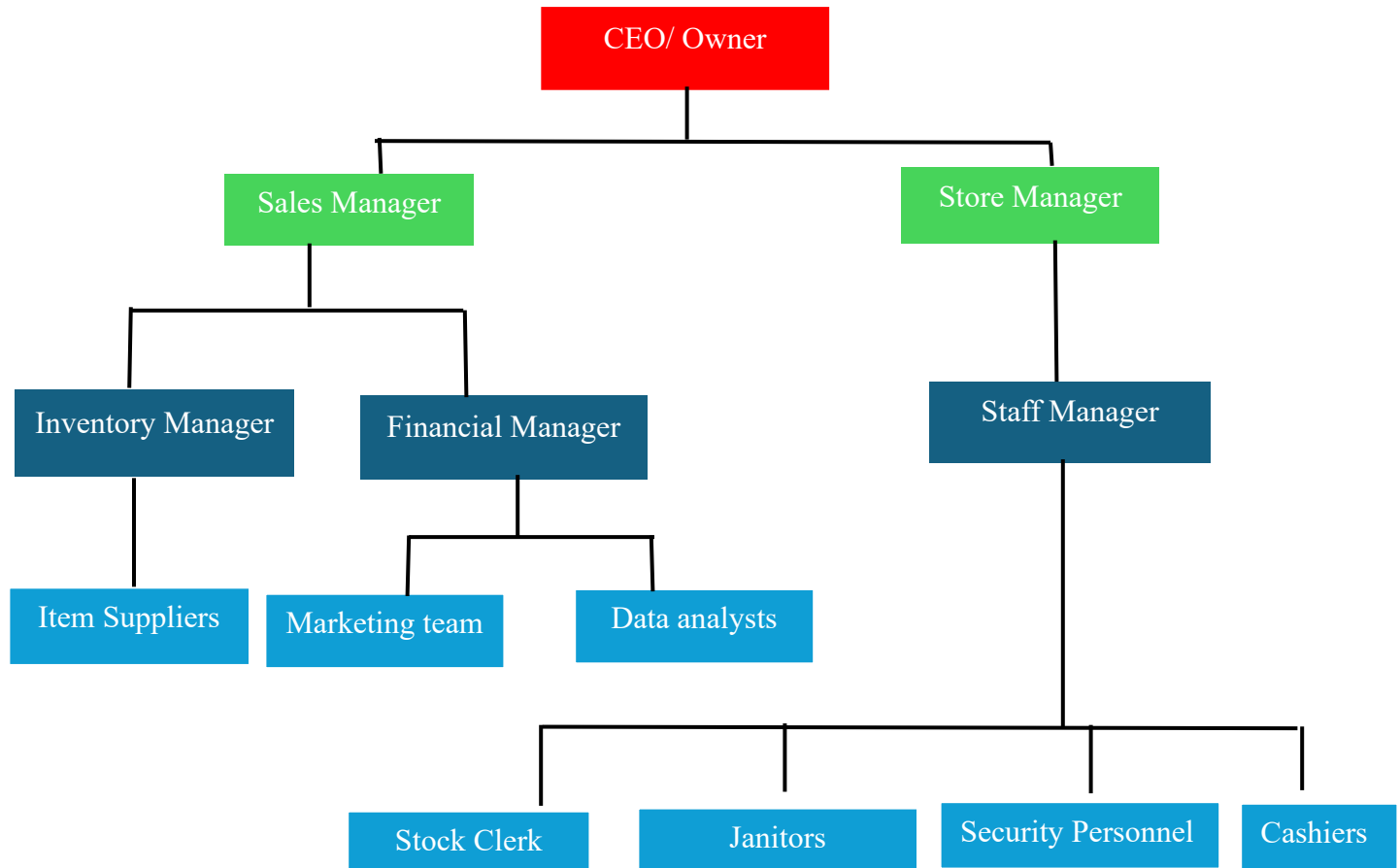
- **Vision**

To provide our local customer community with the best quality products at the most reasonable prices, ensuring unwavering trust in our customers and community.

- **Mission**

Our purpose is to deliver fresh ,high-quality products at a reasonable price while prioritizing customer satisfaction.

## 1.2 Organizational structure



### 1.3 Current operations in Organization

NATO mini mart currently maintains a manual system where the Customers should visit the store to purchase groceries and other products. Customer should physically select items that he/she wants to buy and bring it to the checkout counter later the groceries are checked one by one by the stock clerk. Once the grocery items are checked the stock clerk hand writes the customer's personal info for security purposes in a spreadsheet .Then the stock clerk directs the customer to the cashier counter to proceed with payment. Once the payment is made, the cashier also records the purchase items and payment details in a spreadsheet, then the customer is handed over the grocery items and may exit the store.

#### **Limitations of the current system**

- Manual inventory management system
- Limited customer base
- Customer inconvenience
- Unreliable
- Not secure Enough
- Time consuming in recording purchases

## 1.4 User and responsibilities of the Organizations

- CEO/Director
  - Oversees the overall organization.
  - Represent the organization to the stakeholders.
  - Makes key decisions within the organization.
- Store Manager
  - Oversees the staff manager and store operations.
  - Manages the day-to-day operations of the supermarket.
  - Handles customer complaints and employee complaints.
- Sales Manager
  - Manages inventory managers, financial manager, marketing team and data analysts.
  - Represents company to brand deals and offers.
  - Decides suitable products to purchase
- Staff Manager
  - Manages stock clerks, janitors, security personals and Cashiers.
  - Keeps track of employee attendance.
  - Manages employee payroll ensuring accurate payment on time.
  - Manages Recruitment and hiring of new employees.
  - Provides staff training and support.
- Financial Manager
  - Generates financial statements and creates reports.
  - Handles tax returns and compiles with tax regulations.
- Data analysts
  - Gathers and analyzes data related to sales, customer behavior and inventory.
  - Creates reports about the organization's performance.
- Inventory Manager
  - Works with the item suppliers to order products and make deals.
  - Oversees the ordering and stocking of products in the supermarket.

## 1.5 Problem definition

NATO mini mart is a retail grocery store located in wadduwa Sri Lanka ,due to the current situation in Sri Lanka NATO mini mart is facing several challenges that is affecting its growth and customer engagement. Despite having quality products and a loyal customer base NATO mini mart is currently store limited by its physical presence which restricts the company's ability to expand and broaden the targeted audience .

### Main problems of the current manual system

- Time consuming

- Manual systems mainly rely on human labor and lacks the efficiency provided in automated computer processes therefore making processes more time consuming.

- Difficulty expanding customer base

- the inability to reach customers that are not in the local area limits sales potential.

- Inability to store accurate payments records and sales records

- Manual processes for sales tracking and payment tracking are not reliable because manual labor can lead to errors and inefficiencies.

- Customer inconvenience

- Wide range of customers prefer online shopping rather than visiting the store resulting in customer inconvenience.

- Competitive disadvantages

- Competitors such as Keels and Cargills already have online platforms attracting more customers away from the physical store.



## 1.6 Project Objectives

### **Project scope**

The aim of this project is to design and create a fully functional website application for NATO mini mart to replace the current manual system while enhancing the productivity, efficiency, and security of the entire system by deploying the new system. We also focus on reducing the cost of maintenance.

### **Main Objectives**

- To create a database to store user details, item details, shopping cart, and order history.
- To create an attractive user interface for interaction between the user and the system.
- To create an order management system track details of the order
- To provide a checkout for multiple payment options.
- To provide customer support and assistance to users.
- To integrate promotional features .
- To ensure security for the user profiles.
- To enable add to cart system where the customer can pin items for future purposes.
- Add automated processes to reduce time spent.

## 1.7 Proposed solution

The proposed solution for the NATO mini mart's requirements is to replace their existing manual system with an online grocery store management system.

### **Functional Requirements**

- User Registration and Authentication
  - Users should be able to sign in by providing information like username, number, address, email and Password.
  - User password and username should be authenticated with every log in and log out.
  - The system should have a separate log in for administrators.
- Product Catalog Management System
  - Display a catalog of products categorized by type
  - users used be able to search for products
  - Each product should contain detailed information about the product
- Shopping cart Management system
  - Users should be able to add products to the cart
  - Users should be able to remove already added products
  - Total bill of the products in the cart should be displayed
- Order management system
  - Users should be able to see order history
  - Users should be able to delete an already placed order
  - The system should have a separate panel displaying all online orders made
- Payment and checkout management system
  - Users should be able to select payment method (cash/card)
  - Users should be able to use discount coupons when checking out
  - users should be able to review the order details and confirm delivery address

- Inventory Management System
  - The system should allow administrators to edit, view, add, and remove items in the product catalog.
  - The system should allow administrators to update product availability.
- Customer support Service
  - Users should be able to access customer support via online
- Product Rating and review system
  - Users should be able to Rate products and Reviews about the purchase experience
- Customer Profile
  - users should be able to edit their profile information such as profile picture, name, phone, email and address.
  - users should be able to set multiple delivery addresses.

### **Non-Functional Requirements**

- Ease of use
  - The system should be simple and interactive, requiring minimal knowledge to use the system.
- Learnability
  - The system should be easy to learn for new users. New users should be able to navigate through the system without confusion.
- Security
  - The system should provide maximum privacy protection, customer personal details should be highly protected and unauthorized access should be restricted.
- Maintainability
  - The system should be easy to update, fix bugs, and enhance over time without disrupting the user experience.

## 1.8 Chapter Summary

Chapter 1 gives an introduction about NATO mini mart(Pvt) Ltd which was established in 1999 by P.C. Fernando. This chapter also includes the organizational structure of NATO mini mart(Pvt)Ltd, and their responsibilities are also clearly mentioned to get a rough idea about the organization. The above chapter explains the current operation in the organization which is manual system where the store faces limitations such as time-consuming operations, limited reach, and competitive disadvantages due to the lack of an online presence, using manual data to track stocks in inventory, using a manual system to store payment records, difficulty in handling backup data, and lack of security.

The project focuses to address the above-mentioned challenges by identifying and implementing a online grocery store management system to implement features such as User Registration and Authentication, Product Catalog Management System, Order management system, Payment and checkout management system, Inventory Management System, Customer support Service ,Product Rating and review system.

## **Chapter 2 : Methodology**

### **2.1 Introduction**

Chapter 2 : methodology outlines the strategies for creating software for a online grocery store. It contains the data collection techniques, the use of a software process model, the necessary development tools, the testing approach, and the implementation process. This chapter emphasizes a systematic, step-by-step approach to ensure the application is developed efficiently and effectively.

### **2.2 Data Collection Methods**

- Observations

Watching and reading process of the physical minimarket

- How basic operation happens.
- How organization members interact with customer .
- How suppliers interact with item inventory .

- Questionnaires

In here our main goal is identify the user requirement clearly

- Close ended question

After observations we prepare predefined questions (yes/no questions ) and ask the customer .

[using close ended question, we can Identify what the customer doesn't want ].

- Open ended question

We allow customers to give detailed answers their words .[using open ended questions we identified customer really want]

- Interviews with stakeholders

Interviews are one of the most common and effective techniques for requirement gathering. That allows the project team to directly engage with stakeholders, ask clarifying questions, and gather details.

- Document Analysis

- Business plans and reports

Look at the market's sales reports and strategic documents (business goals )to gather insights into how the system should support growth .

- Current system documentation

If the market already uses a system (POS) documentation analyze and get some features (admin UI)

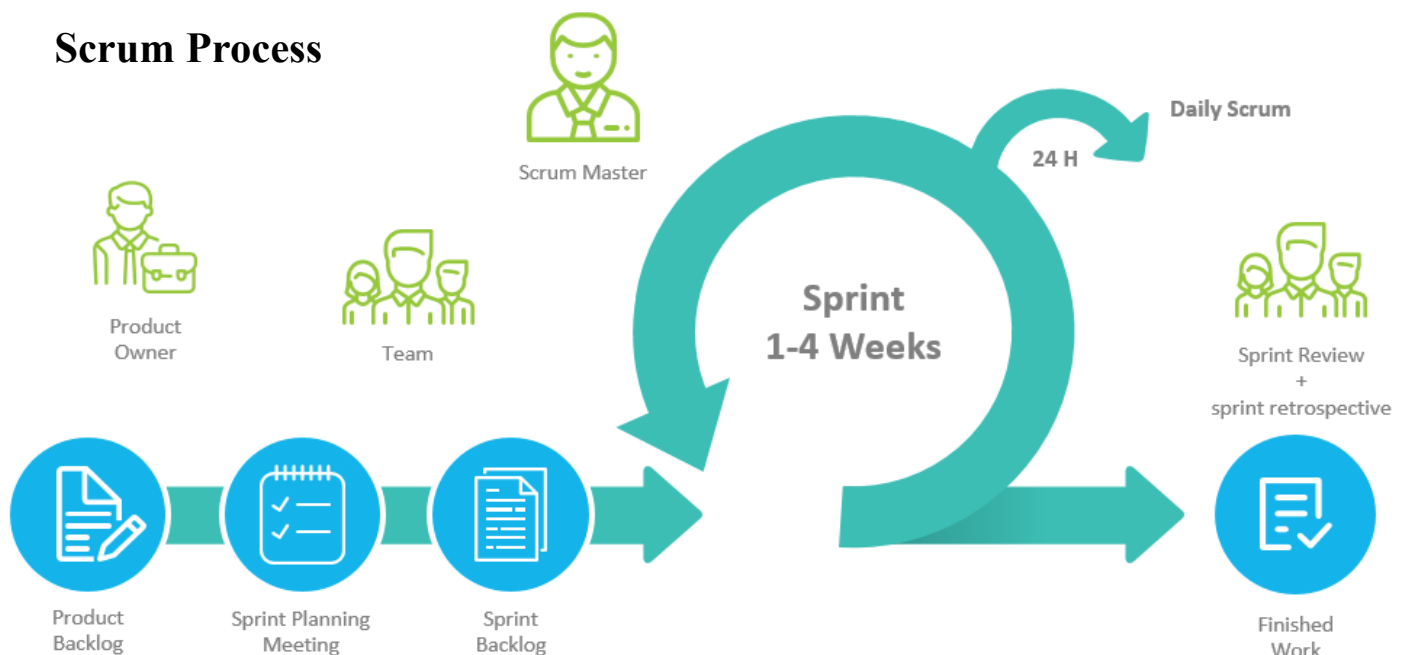
## 2.3 Software Process Model

To develop this Online grocery store software, we propose of using agile methodology due to its iterative and incremental development process. Agile is a software development method where a group of cross-functional teams develops software. The most suitable technique we propose to use is the scrum methodology to develop the software because our team can break the processes into sprints and work according to a sprint backlog.

### Why we use agile methodology

1. Frequent Changes in Requirement
  - Agile is ideal when requirements are expected to evolve throughout the project. It allows for flexibility and continuous adaptation.
2. High Customer Involvement
  - When stakeholders need to be closely involved and feedback is required at regular intervals, Agile helps integrate their input in real-time.
3. Innovative and Experimental Projects
  - When working on cutting-edge or experimental products where there's uncertainty, Agile allows room for trial, error, and course correction.
4. Sort time schedule
  - Agile enables rapid delivery by breaking work into short, iterative sprints, prioritizing essential features, and adapting quickly to changes, within tight deadlines.

### Scrum Process



## 2.4 Software Development tools

The development tools that will be used for our software is as follows:

- Visual Studio Code



-Visual Studio Code is a powerful software development platform that is used to create a wide range of software applications. Visual Studio code offers multiple languages, extensions, Integrated git and debugging tools.

- MySQL server



-MySQL Server is a popular open-source Database Management System that uses Structured Query Language(SQL) for managing databases and organizing data in applications.

- GitHub



-GitHub is a powerful software that allows developers to collaborate on code, manage projects, and build software together. It uses Git, a version control system(VCS) to developers to manage their codebase overtime.



- Figma



-Figma is a collaborative design tool widely used for interface designing, prototyping and real time collaboration. Figma can be used by many users who are interested in working in the same project in Realtime.

- Draw.io



- Draw.io is a software that allows users to create various types of diagrams such as UML diagrams, Flowcharts, networks diagrams, etc. draw.io is commonly used because of its simplicity, collaborative tools, and exporting diagrams in multiple formats.

- Bugzilla(for automate the testing phase)



- Bugzilla is a software that helps the teams track issues, manage software defects, and collaborate on software development tasks. Bugzilla provides a central place for developers, testers, and stakeholders to report and track bugs.

## Programming Languages

- HyperText Markup Language(HTML)



- HTML(HyperText Markup Language) is the standard language used to create the basic structure of a website.

- Cascading Styling Sheets(CSS)



- CSS(Cascading Styling Sheets) is a styling language that is used to Design and make a website more appealing .

- JavaScript(JS)



- JavaScript is used for website interactions such as opening a pop-up window, validating a login, or getting information

- PHP



- PHP is an opensource server-side scripting language designed primarily for web development.

## 2.5 Testing Strategies

- Unit testing

testing individual components(parts) or modules of the software to ensure that each one functions as intended

expect to test – user can register to system using user information .

- user can login using email and password .
- user can add item to the cart .
- user can select the product quantity

- Integration testing

testing how different modules or components of a system work together as a whole (combined units ) .

expect to test – user can check out after only login or register to the system .

- user can make payment after checking out

- System testing

The entire system is tested as a whole to verify that it meets the specified functional and non-functional requirements. It comes after unit and integration testing.

expect to test – Verifying that customer data is correctly handled and stored

- Ensuring accurate calculations, discount applications, tax calculations, and receipt generation.

- Testing how different users (admin, managers, customers) interact with the system and ensuring role-based access control functions as expected.

- Acceptance beta testing

The system is released to a selected group of end-users in a real-world environment. And get the user feedback .

Goal – ensure that all critical functions work smoothly in real-life situations.

## 2.6 Implementation

The successful implementation of the Online grocery store system requires a systematic and well-coordinated plan. The project will be developed within a period of 12 weeks. The implementation plan is structured into key phases to ensure a smooth transition from development to deployment :

	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
Requirements Analysis												
Designing the solution												
Coding the solution												
Testing and Debugging												
Implementation												

### **Implementation Approach**

As an implementation method We are planning to use direct approach to implement the software in order to ensure a reliable output and to develop the software to satisfy the customer.

- **Parallel Approach**

- Parallel deployment approach is where both the current system (manual system) and the new system (online grocery store system) are operated simultaneously for a defined period. A parallel approach allows you to compare results from both systems to ensure consistency. Our goal is to implement this new online grocery store management system while using the existing manual system.

## 2.7 Chapter Summary

The methodology chapter outlines the process for developing an online grocery store for NATO Mini Mart, Data collection methods include observations of store operations, customer surveys (both close-ended and open-ended questions), interviews with stakeholders, and document analysis to gather user requirements and insights.

The software process model that will be used is Agile methodology, The Agile technique that will be used is Scrum, this method is ideal given the project's expected frequent changes, short timeline, and need for close customer involvement.

Development tools will be used to create the system, including Visual Studio Code for coding, MySQL for database management, GitHub for version control, Figma for interface design, and Bugzilla for tracking bugs during testing. The programming languages to be used include HTML, CSS, JavaScript, and PHP.

The software testing multiple testing stages: unit testing for individual components, integration testing for combined modules, system testing to ensure full functionality, and acceptance testing to gather real-world feedback from users before full deployment.

The implementation plan is scheduled for 12 weeks. We propose A parallel implementation approach, where the manual and new online systems will operate simultaneously to ensure a smooth transition. This method allows for comparison between the two systems, ensuring the reliability of the online store before fully phasing out the manual system.

# NATO MINI MART

B.R.N :- W/CC/4846

12.09.2024

School of Computing  
National Institute of Business Management,  
No.120/5, Vidya Mawatha,  
Colombo 07.

Dear Sir/Madam,

## Permission Granted for a Software Development Project

This letter is to inform you that NATO Mini Mart (Pvt) Ltd grants permission for the following students at National Institute of Business Management to develop a software application for our business as a part of their final project.

1. Mr. H.S. Perera (CODSE233F-153)
2. Mr. W.D.R.Thiwanka (CODSE233F-154)
3. Mr. S.N.Wanasinghe (CODSE233F-163)
4. Mr. G.N.P. Wickramasinghe (CODSE233F-165)

We are willing to provide any necessary information to ensure successful completion of the project.

Should you require any further information or have any questions, please feel free to contact us  
Natogroupwadduwa@gmail.com

Sincerely,



(Chirath Fernando)

Directing Manager

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**NATO MINI MART**

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