MERCHANDISING MANAGEMENT SYSTEM: “FINANCE MANAGEMENT AND SALES FORECASTING USING MICROSOFT AZURE MACHINE LEARNING”

A Capstone
Presented to the Faculty of
The College of Computer Studies
Bestlink College of the Philippines

In Partial Fulfilment

Of the Requirements for the Degree of
Bachelor of Science in Information Technology

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October 2024

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ACKNOWLEDGMENT

The researchers would like to express their heartfelt thanks and gratitude to the following persons who, in one way or another, has contributed much, and extended willingness and support needed to make this research possible:

Dr. Maria M. Vicente, President/CEO, Bestlink College of the Philippines, for her generosity and kind heart in establishing this institution and giving opportunities to those less fortunate students to continue their studies and pursue their dreams;

Ms. Edith M. Vicente, Executive Vice President, for providing the needed information to complete this research;

Dr. Charlie I. Cariño, Vice President for Academic Affairs, for his support and encouragement to make this thesis writing possible;

Engr. Diosdado T. Lleno, Vice President for Administration and Finance, for his words of encouragement and motivation;

Dr. Joy Evelyn A. Ignacio, Director, Center for Research and Development, for her good heart to extend her help needed by the researchers.

Dr. Rosicar E. Escober, Dean, College of Computer Studies of Bestlink College of the Philippines, for providing a guideline documentation in capstone project.

Mr. Rommel J. Constantino, Program Head, Bachelor of Science in Information Technology, for the constant supervision as well as providing necessary information regarding the project and also for his support in completing this project.

Mr. Ronald G. Roldan Jr., Research Coordinator, for helping us in improving our research and guiding us in completing this project.

Mr. Paulo Tolentino, Capstone Adviser, for giving us suggestions and ideas to improve our research and guiding us in completing this project.

Panelists, Mr. Rommel J. Constantino, Mr. Vincent Carlo T. Garados, and **Mr. Glenox O. Luzong** who extended their effort and time to be able to constructively criticize this thesis and share their knowledge with them to deepen and widen their needed information.

Families and Friends, for all the financial and moral support that have enabled the researchers to triumph all the challenges, especially during the lowest time that served as their inspiration to complete this study; and

Above all, to the **Almighty God,** for the strength and knowledge that were used for the accomplishment of this research journey.

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DEDICATION

This business research study is wholeheartedly dedicated first and foremost to the researchers, for executing dedication, time, effort, motivation, sacrifice, and courage to make this conducting study a fruitful and successful piece of work.

To our beloved parents who have been our inspiration and gave us strength when we thought of giving up, which continually provide their moral, spiritual, emotional and financial support.

To each sibling and circle of friends who shared their words of advice and encouragement to finish this study.

To the research advisers and professors, for extending help by giving guidance, supervision, time and wisdom to the researchers in conducting this business research study.

And lastly, above all, to our Almighty God, for giving guidance, strength, power of mind, protection, skills and for giving us a healthy life. All of these we offer to you.

THE RESEARCHERS

ABSTRACT

Title: MERCHANDISING MANAGEMENT SYSTEM: "FINANCE MANAGEMENT AND SALES FORECASTING USING MICROSOFT AZURE MACHINE LEARNING"

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CHAPTER 1

INTRODUCTION

In the current business world, the proper handling of funds becomes central to the survival and success of Great Wall Arts, which is a wholesaler and retailer of locally made hand crafted merchandise. The idea of finance module is to improve the financial decision making process by including powerful sales forecast, budget and cost control components in the company. That's why this particular module includes sophisticated analytical mechanisms that help to define the tendencies in sales to allow for adequate inventory and resource management in Great Wall Arts.

In this process of introducing integration concept in this module, information from the financial professionals and practitioners involving use of technology in the transformation of the financial processes peculiar to the Great Wall Arts will be incorporated. It will therefore be the aim of this research to determine how; the sales forecasting and budgetary management methodologies can be put into practice to enhance the financial position of the business as to support the cause of embracing local artists and traditional craftsmanship.

An important component of the system is analytical reporting to track actual financial performance comparing to the budgets and forecasts set for Great

Wall Arts. Not only does it serve as a means of accountability, it also provides decision makers the tools to make the necessary changes independently of planned strategies according to the actual results achieved. With the help of this technological solution, Great Wall Arts can significantly manage its financial aspect effectively and promote solid growth in such a strategize environment, which forms its services' value proposition as unique and reliable.

Background of the Capstone Project

Great Wall Arts is leveraging Microsoft Azure Machine Learning to improve its financial management processes and sales forecasting. The system can analyze historical data and market trends, enhancing the accuracy of sales forecasts. This allows Great Wall Arts to better understand consumer behavior, enabling more precise demand predictions and minimizing risks associated with overstocking and stockouts of locally handcrafted products. A comprehensive finance module powered by Azure Machine Learning can transform Great Wall Arts budgeting practices, enabling dynamic budgeting processes that align financial resources with immediate operational needs and long-term objectives. This enables strategic resource allocation, optimize cash flow, and enhance profitability amid economic uncertainties. The deployment of Azure Machine Learning within Great Wall rts operational framework can streamline sales data and financial information management, providing actionable insights that drive operational efficiency. This integration supports the company's mission to promote local artisans and deliver unique, high-quality products to customers. As a result, Great Wall Arts can seize growth opportunities and strengthen its competitive edge in the dynamic retail sector.

Context and Scope

Great Wall Arts, a leading retail company, is strategically utilizing Microsoft Azure Machine Learning to refine its financial management processes and bolster its sales forecasting capabilities. This innovative approach aims to streamline operations related to sales tracking, budgeting, cost management, and forecasting, ensuring that the company can effectively align its sales strategies with financial objectives while navigating a competitive retail environment. The integration of Azure Machine Learning offers Great Wall Arts the ability to enhance its sales forecasting accuracy significantly. By leveraging advanced predictive analytics and machine learning algorithms, the company can gain deeper insights into market trends and consumer behaviors. This capability not only aids in aligning sales initiatives with financial planning but also optimizes inventory management by minimizing risks associated with overstocking and stockouts.

Moreover, adopting a comprehensive Finance Module powered by Azure Machine Learning facilitates more effective budgeting processes at Great Wall Arts. The module allows for data-driven financial planning that adapts to real-time changes in sales forecasts and operational needs, enabling the company to allocate resources more effectively. By automating budgeting tasks and utilizing predictive analytics, Great Wall Arts can enhance its

decision-making processes, ensuring that financial resources are utilized optimally.

Despite the advantages brought by integrating Azure Machine Learning, Great Wall Arts faces challenges in implementing a comprehensive finance module. Issues such as fragmented data sources, outdated technology, and the lack of integration among financial processes can hinder the efficiency of the Finance Module. Therefore, it is crucial for the company to address these barriers to fully exploit the potential benefits of Azure's capabilities.

Problem Statement

Great Wall Arts, a retail company, is leveraging Microsoft Azure Machine Learning (Azure ML) to improve its financial management processes and sales forecasting accuracy. By implementing advanced predictive analytics, the company can analyze historical sales data alongside market trends and consumer behavior, aligning inventory and staffing levels with actual demand. Accurate sales forecasting is crucial for effective budgeting and managing operational costs, as it directly influences inventory management and workforce planning. Azure ML helps mitigate issues such as overestimating sales, underestimating demand, and missed revenue opportunities. It also helps analyze external factors like fluctuating economic conditions, inflation rates, and competitive

actions, enabling informed decision-making regarding pricing strategies and product offerings. Azure ML also facilitates effective cost management through enhanced budgetary control, enabling real-time monitoring and budget allocation based on predictive insights. It can also anticipate price changes and assess their impact on overall costs and pricing strategies, ensuring profitability while maintaining competitive pricing for unique, high-quality products. By integrating Azure ML, Great Wall Arts aims to enhance its financial management processes and improve sales forecasting accuracy, supporting its mission to promote local artists and deliver exceptional products to customers.

Objectives and Goals

Invest in the development and implementation of a Finance Management System module that improves businesses' sales forecast, budget, and cost management by providing data intelligent tools and automating financial processes, offering detailed reports, allowing tracking of budgets in, and supporting strategic decision-making using analytics capabilities.

Goals	Description
Financial Optimization	- Ensuring that resources are used efficiently and effectively, minimizing waste and maximizing productivity

Budgetary Control	- To set limits on spending and ensure that expenses stay within budgeted amounts.
Financial Planning	**-** To create a detailed financial plan that outlines expected revenues, expenses, and capital needs
Demand Forecasting	- To predict sales accurately so that inventory levels are optimized, reducing overstock and stock-out

Table 1: Goals and Objectives

Establishing and sticking to certain objectives will help you take control of the direction of your business and improve the probability that you will achieve your bigger objectives. Businesses can track performance, handle money wisely, and make wise financial decisions when they have a well-managed budget.

Significance and Relevance

The significance and relevance of this is to improve the sales of the company, data and market trends. This involves planning and allocating resources of the company. There should be marketing and procurement and operations. Monitoring cost helps sourcing, warehousing, distribution and sales.

Structure of the Document

Executive Summary

- A synopsis of the final project.
- A brief description of the system and its purpose

Introduction

- This section provides an overview of the project, including its objectives, scope, and the significance of implementing a finance module within the merchandising management system to enhance financial decision-making and operational efficiency.

Project Objectives

- Improving the accuracy of sales forecasting to optimize inventory levels.
- Establishing effective budgetary controls to ensure adherence to financial limitations.
- Enabling detailed cost management strategies to reduce operational

expenses.

- Providing analytical reports to facilitate better financial oversight and planning.
- Enhancing user experience with intuitive interface design for ease of use.

Features Overview

- Sales Forecasting: Implementing tools and methodologies to predict future sales accurately, allowing for efficient inventory management.
- Budget Management: Creating structured budgeting processes that allow departments to plan and control their financial resources effectively
- Cost Management: Providing functionalities for monitoring and controlling costs associated with procurement, inventory, and operational expenses.
- Financial Reporting: Generating financial reports that offer insights into performance, budget compliance, and sales performance.
- User-Friendly Interface: Designing an intuitive interface that facilitates navigation and improves user interaction with the system.
- Microsoft Azure Machine Learning: Leveraging advanced cloud-based machine learning capabilities for predictive analytics and data modeling, enhancing the accuracy of sales forecasts and financial projections.

Implementation Plan

- Phases of implementation detailing the development, testing, and deployment processes.
- Timeline for each phase, including milestones and deliverables.
- Testing and quality assurance procedures to ensure reliability and functionality of the finance module.

Challenges and Mitigations

- Identification of potential challenges in implementing the Microsoft Azure Machine Learning, such as data integration issues and user adoption resistance.
- Strategies and contingency plans for overcoming challenges, including training sessions and support resources.

Conclusion

- Summary of key points discussed in the document.
- Reinforcement of the project's significance and its potential impact on enhancing financial operations within merchandising businesses.

Future Enhancements

- Possibilities for future improvements and expansions, such as incorporating advanced analytics and machine learning capabilities for sales forecasting.
- Adaptability to emerging technologies and industry trends to

maintain competitiveness and relevance.

References

- Citations for relevant industry trends, research studies, and best practices in financial management and merchandising systems.

Appendices

- Supplementary materials, including charts, diagrams, and additional documentation that support the project's development and findings.

CHAPTER 2

RELATED STUDIES AND LITERATURE REVIEW

Agile Scrum Methodology Overview

The Agile Scrum methodology plays a transformative role in businesses by promoting adaptability, collaboration, and iterative progress. Originally developed for software development, Agile Scrum is increasingly applied in various research fields due to its focus on responsiveness and team collaboration. In the context of business financing, Agile Scrum can provide the necessary structure and flexibility to effectively explore complex financial topics, leading to continuous improvement in processes. Agile Scrum enables organizations to adapt more swiftly to market changes, customer needs, and unforeseen challenges. By working in short iterations, known as sprints, businesses can rapidly pivot, adjust priorities, or introduce new features based on feedback or shifting market conditions. This iterative approach breaks down projects into smaller, manageable tasks that can be completed and reviewed within a few weeks.

Furthermore, Agile Scrum encourages teams to concentrate on high-priority tasks, thus eliminating unnecessary activities. This focus minimizes wasted time, effort, and resources, ultimately resulting in improved cost efficiency. Agile Scrum encourages teams to focus on the most important

tasks, eliminating unnecessary or low-priority activities. This minimizes wasted time, effort, and resources, leading to better cost efficiency.

Enterprise Architecture Concepts

Enterprise Architecture (EA) serves as a crucial framework for aligning business strategies with IT systems, ensuring that organizational goals are met efficiently. In finance, EA concepts are particularly instrumental in optimizing financial operations, enhancing cost management, ensuring compliance, and facilitating strategic decision-making.

EA integrates diverse data sources and analytics tools, empowering finance departments to utilize data for forecasting and budgeting. This capability leads to more accurate financial forecasts, which enhance strategic planning and effective resource allocation.

To successfully integrate information systems into a business environment, it is essential to understand the specific needs of the organization. This includes identifying processes that can be refined through technology and selecting appropriate information systems that align with business objectives, such as Enterprise Resource Planning (ERP) or Customer Relationship Management (CRM) systems.

Business Architecture

This defines the business processes, organizational structures, and strategies related to the Merchandising Management System's finance module, specifically focusing on the integration of Microsoft Azure Machine Learning. The architecture emphasizes enhancing sales forecasting accuracy, improving budget allocation, and optimizing cost control to drive financial performance. Understanding user workflows is crucial for effectively leveraging predictive analytics, ensuring that sales predictions are accurate, budgets are aligned with forecasts, and expenses are monitored in real-time. This alignment helps guarantee that financial resources are allocated efficiently and effectively throughout the organization.

Data Architecture

This structures the management and flow of financial data within the Merchandising Management System, with a focus on harnessing Microsoft Azure Machine Learning for enhanced financial management and sales forecasting. The architecture ensures that sensitive information related to sales forecasts, budget allocations, and cost management is securely stored and accessed using robust encryption methods. It facilitates efficient data processing and reporting, enabling timely and accurate financial analysis that supports informed decision-making. Compliance with data

privacy regulations are prioritized to safeguard organizational and customer financial information, fostering a secure environment for financial operations while leveraging advanced analytics and machine learning capabilities to improve predictive accuracy and operational efficiency.

Application Architecture

This focuses on designing software components that ensure features like sales forecasting, budget management, and cost tracking integrate seamlessly with the Merchandising Management System's finance module, powered by Microsoft Azure Machine Learning. This comprehensive approach guarantees that each component interacts cohesively, enhancing the overall user experience. Users can leverage advanced analytics to access up-to-date financial data, dynamically adjust budgets based on predictive insights, and generate real-time reports. This facilitates effective financial decision-making and optimizes resource allocation, ultimately driving improved business performance through enhanced forecasting accuracy and operational efficiency.

Technology Architecture

This centers on the underlying infrastructure that supports the finance module, specifically focusing on enhancing financial management and sales forecasting through Microsoft Azure Machine Learning. The system leverages secure cloud storage to manage large volumes of financial data, ensuring fast and accurate access to critical information

related to sales forecasting, budget management, and cost analysis. This robust technology architecture is designed to support scalability and flexibility as business needs evolve, enabling organizations to easily integrate advanced machine learning capabilities and adapt to changing market conditions while maintaining reliable server and database functionality.

Security Architecture

This emphasizes the protection of sensitive financial data through encryption and role-based access control. The system's security architecture guarantees that only authorized personnel can access confidential sales and budgeting information, ensuring compliance with relevant financial regulations and safeguarding the integrity of financial operations.

Agile and Incremental Development

The whole development process employs an Agile approach which involves feedback from stakeholders within Great Wall Arts and the further development of some features of the finance module oriented at improving the effective management of finances and sales forecasting using the Microsoft Azure Machine Learning. This strategic approach provides adaptability in such a way that the system's development is determined by the users' requirements and the ever-changing nature of the merchandising field. By adding the prompt of recent changes and new

improvements, Great Wall Arts can manipulate to the shifts of the market and the demand of the customers. In this way, Great Wall Arts ensures that the finance module is ready to assist the organization in achieving its objectives of sponsoring local artists and offering unusual and quality artifacts.

Microservices Architecture

The challenge lies in enhancing the efficiency and accessibility of financial management processes within the merchandising system. Adopting a microservices architecture allows the finance module to be broken down into smaller, independent services that can be developed, deployed, and scaled independently.

Key Microservices:

1. **Sales Forecasting Service:**

- Analyzes historical sales data to generate accurate forecasts.
- Integrates with external market data sources to enhance prediction accuracy.
- Budget Management Service:
- Manages budget creation, approval workflows, and modifications.

- Tracks actual expenditures against budgets to facilitate variance analysis.

2. **Cost Management Service:**

- Monitors and categorizes expenses across different departments.
- Identifies cost-saving opportunities through data analysis.
- Benefits of Microservices Architecture

Benefits of Microservices Architecture

Scalability: Each microservice can be scaled independently based on demand, ensuring optimal performance during peak times.

Flexibility: New features and services can be added without impacting the entire system, allowing for quick adaptations to user feedback or market changes.

Resilience: If one microservice fails, the others can continue operating, minimizing downtime and ensuring continuity of financial operations.

Technology Agnostic: Each microservice can utilize the most suitable technology stack for its specific requirements, promoting innovation and efficiency.

Continuous Delivery: Microservices can be developed, tested, and deployed independently, leading to faster development cycles and improved responsiveness to user needs.

DevOps and CI/CD: A Strategic Approach

DevOps, as a cultural and technical framework, enhances collaboration between development and operations teams, enabling faster and more reliable delivery of the finance module. Continuous Integration (CI) and Continuous Delivery (CD) are integral practices that automate the building, testing, and deployment of financial applications.

Key Principles of DevOps and CI/CD:

Automation: Streamlining repetitive tasks like building, testing, and deployment reduces errors and boosts efficiency.

Collaboration: Fostering collaboration between development and operations teams enhances communication and speeds up the delivery process.

Continuous Improvement: Establishing a culture of ongoing optimization to enhance software quality and delivery speed.

Version Control: Implementing version control systems to track codebase changes facilitates teamwork and ensures accountability.

Applying DevOps and CI/CD to the Finance Module:

1. **Infrastructure as Code (IaC):**

- Use IaC tools like Terraform to define and manage the infrastructure needed for the finance module. This approach ensures consistency and efficiency in resource provisioning.

2. **Source Code Management:**

- Choose a version control system like Git for collaborative code management.
- It enables tracking changes and simplifies collaboration among development teams.

3. **Continuous Integration (CI):**

- Set up CI pipelines to automate the building, testing, and packaging of the finance module components.

- Frequent integrations help catch issues early in the development cycle.

4. **Continuous Delivery (CD):**

- Implement CD pipelines to automate the deployment process across different environments.
- This decreases manual intervention and accelerates the rollout of new features.

5. **Containerization:**

- Utilize container technologies like Docker to package the finance module and its dependencies.
- This method ensures consistent behavior in various environments, enhancing deployment simplicity.

6. **Monitoring and Logging:**

- Implement monitoring tools to oversee the performance and health of the finance module.
- Continuous logging of system events aids in troubleshooting and enhancing system reliability.

7. **Feedback Loops:**

- Establish feedback mechanisms to gather user insights regarding the finance module's performance.
- Utilize this feedback to continuously refine the module and improve user satisfaction.

Benefits of DevOps and CI/CD for QR Code Implementation

- **Faster Time to Market:** Automated processes and streamlined workflows accelerate the delivery of new features and enhancements within the finance module, enabling businesses to adapt quickly to market changes.
- **Improved Reliability:** CI/CD practices facilitate early detection and resolution of issues, significantly reducing the risk of failures in financial reporting and cost management processes.
- **Enhanced Scalability:** The underlying infrastructure can be easily scaled to accommodate varying financial workloads, ensuring optimal performance during peak business periods such as tax season or end-of-year reporting.
- **Greater Efficiency:** Automation of repetitive tasks within sales forecasting and budgeting processes minimizes manual effort, allowing financial teams to focus on strategic decision-making and analysis.
- **Increased Quality:** Continuous integration and testing provide immediate feedback on code changes, leading to higher-quality

features and improved accuracy in financial forecasts and budget tracking capabilities.

Relevant Studies and Research

Foreign Research

Charles E. Menifield's (2021) "The Basics of Budgeting and Financial Management" serves as a critical resource that underpins the theoretical and practical aspects necessary for developing the finance module of your capstone project. By utilizing the concepts and strategies detailed in Menifield's work, your merchandising management system can achieve improved sales forecasting, effective budget management, and comprehensive cost control, ultimately enhancing its functionality and value for users.

Chang-Yi Kao and Hao-En Chueh (2022) Deep Learning Based Purchase Forecasting for Food Producer-Retailer Team Merchandising the research by Kao and Chueh provides valuable insights and methodologies that can significantly enrich the development of your merchandising management

system's finance module. By incorporating deep learning techniques for sales forecasting, enhancing cost management strategies, and facilitating collaboration among stakeholders, your project can effectively address the complexities of budgeting, sales forecasting, and cost control in merchandising management.

Chih-hsuan Wang's article (2023) "Sales Forecasting, Market Analysis, and Performance Assessment for US Retail Firms: A Business Analytics Perspective" provides essential insights that can significantly enhance the development of your merchandising management system's finance module. By integrating advanced sales forecasting techniques, market analysis, performance assessment metrics, and data-driven decision- making principles, your project can effectively address budgeting and cost management challenges within the retail sector, leading to improved operational efficiency and financial performance.

The article "Journal of Public Budgeting, Accounting & Financial Management" by Gonca Güngör Göksu (2023) provides essential principles and methodologies that can significantly enrich the development of your merchandising management system's finance module. By applying the budgeting techniques, sales forecasting methods, and cost

management strategies discussed in the article, you can enhance the functionality and effectiveness of your system, ultimately leading to improved financial performance and operational efficiency in the retail sector.

The article "Improving Sales Forecasting Accuracy: A Tensor Factorization Approach with Demand Awareness" by Xuan Bi, Gediminas Adomavicius, William Li, and Annie Qu (2022) provides valuable methodologies that can significantly enhance the functionality and effectiveness of the finance module in your merchandising management system. By adopting their tensor factorization approach for sales forecasting, incorporating demand dynamics, and leveraging large data sets, It can improve budgeting and cost management practices while driving more informed decision-making in retail operations.

Local Research

The article "Financial Management Practices and Challenges Among Food Cart Businesses in Nueva Ecija, Philippines: Insights and Implications" by Arjhel Domingo and John Paul Prado (2024) provides foundational insights that can significantly enhance the development and functionality of the

finance module in your merchandising management system. By focusing on financial management practices, challenges, and targeted solutions, your project can effectively address the needs of small business owners, improve sales forecasting accuracy, and optimize budgeting and cost management strategies.

The article "The Role of Strategic Cost Management in Marketing Decisions: A Case Evidence of Brand Acquisition Assessment" by Richard Kristoffer S. Manapata and V. G. Sridharan (2020) provides the article by Richard Kristoffer S. Manapata and V. G. Sridharan provides valuable methodologies and insights that can significantly enhance the development of the finance module in your merchandising management system. By incorporating strategic cost management principles, improving sales forecasting accuracy, aligning budgeting with strategic goals, and implementing robust cost analysis and performance measurement tools, It can effectively address the complexities of financial management in the retail sector while enhancing operational efficiency and decision-making.

The article "The Cash Flow Activities and Budgeting Process of Selected Micro Businesses in Batangas City: Basis for Budgeting Strategies" by Arline A. Mandigma et al. (2023) provides the research conducted by Arline A. Mandigma and colleagues provides practical insights that can significantly enhance the development of the finance module in your merchandising management system. By focusing on cash flow activities, budgeting processes, and strategies specifically designed for microbusinesses, your project can offer a comprehensive solution that improves financial planning, sales forecasting accuracy, and overall budget and cost management capabilities for users in the retail sector.

The article "Forecasting of Liquefied Petroleum Gas (LPG) Refilling Plant Sales in Time Series Using Statistical Approaches and Machine Learning Techniques" by Mary Jane C. Samonte and Jean Shermin B. Geronimo (2022) presents critical methodologies that can significantly enhance the sales forecasting capabilities of the finance module in your merchandising management system.

Integration of Information Systems in Enterprise Environments

The integration of information systems within the organizational paradigm of Integration of Customer Relationship Management with a Concentration in a Merchandising Management System that Comprises a Finance Module for sales prediction, budget & cost management offers immense advantages for the organizations. With a modified system, it is possible to provide instant data across various units within the organization thereby enhancing teamwork and decision-making processes. According to a study conducted by Chae (Chae, 2019), firms with deployed integrated systems were seen to have simplified their finances whereby the need for manual data input was diminished, enhancing the effectiveness of estimates given for finances by the entity. The report further reveals that connecting sales, inventory when calculating finances does not only improve the needed investment for management but rather allows the firms to adapt to changes in the market and demand levels swiftly. The integration of these systems also enhances the flow of information from

one operational area to another enhancing the degree of budget control and cost management. This kind of integration helps to reduce the level of siloization and promotes a coherent approach to financial and other resources management thus increasing overall organizational efficiency and performance measures.

(Chae, M. (2019). The Role of Integrated Information Systems in Supply Chain Management: Insights on Merchandising and Financial Efficiency. International Journal of Information Management, 45, 18-27.)

CHAPTER 3

METHODOLOGY

Agile Scrum Methodology in the Project

Agile Scrum is a highly adaptable and collaborative approach utilized in the creation of the "MERCHANDISING MANAGEMENT SYSTEM: “FINANCE MANAGEMENT AND SALES FORECASTING USING MICROSOFT AZURE MACHINE LEARNING”," allowing the project team to respond to changes while also delivering value to stakeholders. For this project, I applied:

Roles and Responsibilities

Name	Role	Responsibilities
Christian Jay A. Noora	Scrum Master	• Verify project scope. • Supporting requests for changes in scope and impact. • Coordinate and conduct meetings. • Communicate outcomes of scope change requests.

		• Tackles problems that hold up the entire cluster, such as resource constraints and cross-team dependencies.
JAKE FRANCIS V. MIRANDA	Project Manager / Programmer	• Prepare project scope of work, schedules, and cost estimates • . Organize team briefings and updates for stakeholders. • Carry out risk assessment and risk mitigation activities • Supervise the project to ensure deliverables correspond to company goals. • Front-End: Design, reconstruct and incorporate responsive user interfaces and perform tasks of optimizing the system.

ALDRIN M. BULAMBOT	Supporting Document Specialist	• Actively participate in defining change resolutions. • Evaluate the necessity of scope changes and communicate findings and recommendations to the project manager as needed.
KARL ANGELO CAJEFE ABANES	Documentation Specialist	• Develop user manuals, installation guides, and API documentation. • Maintain a knowledge base for project artifacts and resources. • Ensure all documentation is up-to-date and easily accessible. • Assist in creating training materials for users.
RYLBERT M. GANZAN	Programmer	• Conduct user research to understand user demands.

		• Wireframe, prototype, and create hi-fidelity mockups. • Perform usability testing on the designs and modify as necessary. • Work with developers to ensure intended designs are accurately applied.
MARK JOMAR A. MARCELO	Security Analyst	• Conduct threat modeling and vulnerability assessments in financial data. • Design and manage security policies and recommended practices for the system. - Monitor systems to verify that security techniques are in place and respond as needed. • Stay informed about recent cybersecurity issues and

		applicable laws governing retail businesses.

Table 2: Roles and Responsibilities

Sprint Cycles

Regular check-ins and progress evaluations are part of sprint cycles. This could entail holding more frequent feedback meetings between managers and staff in performance management. These check-ins offer the chance to talk about accomplishments, difficulties, and prospective goal revisions.

prospective goal revisions.

Sprint Cycle	User Stories No.	User Stories/ Task	Timeline	Responsible Team Members
Sprint Cycle 1: System Initialization				
Sprint Planning	1	Define project scope, objectives, and requirements	Start of Sprint 1	Jake Francis V. Miranda, Rylbert Ganzan, Karl Angelo Cajefe Abanes
Daily Standups	2	Maintain team alignment and Communication	Daily throughout Sprint 1	Jake Francis V. Miranda
Sprint Review	3	Review and validate the project initiation phase	End of Sprint 1	Jake Francis V. Miranda, Rylbert Ganzan

Sprint Cycle 2: Requirements Gathering and Planning				
Sprint Planning	4	Creating a UI dashboard using Figma	Start of Sprint 2	Project Team
Daily Standups	5	Maintain daily communication and coordination during requirements gathering.	Daily throughout Sprint 2	Project Team
Sprint Review	6	Review and validate the gathered Requirements	End of Sprint 2	Project Team
Sprint Cycle 3: System Design and Architecture				
Sprint Planning	7	Define the system architecture	Start of Sprint 3	Rylbert Ganzan

		and design features		
Daily Standups	8	Coordinate design and architecture tasks	Daily throughout 3	Rylbert Ganzan
Sprint Review	9	Review and validate the system design and architecture	End of Sprint 3	Rylbert Ganzan
Sprint Cycle 4: Development and Testing				
Sprint Planning	10	Start development work on the Merchandising Management System: Finance Module Sales Forecasting , Budget	Start of Sprint 4	Jake Francis V. Miranda

		and Cost Managemen t		
Daily Standups	11	Coordinate development and testing activities, ensuring smooth progress and addressing any issues	Daily throughout Sprint 4	Rylbert Ganzan, Karl Abanes
Sprint Review	12	Review and validate the developed features, gathering feedback on functionality and performance from the system	End of Sprint 4	Jake Francis V. Miranda
Sprint Cycle 5: Testing, Quality Assurance, and Integration				

Sprint Planning	13	Kick off the final phase of the project focusing on comprehensive testing, quality assurance (QA), and system integration.	Start of Sprint 5	Karl C. Abanes, Aldrin M. Bulambot, Mark Jomar A. Marcelo
Daily standups	14	Allowing the team to monitor progress, address challenges, and ensure alignment across testing, QA, and integration activities.	Daily throughout Sprint 5	Project Team

Sprint Review	15	Review and validate the system's quality and integration	End of Sprint 5	Jake Francis V. Miranda, Rylbert Ganzan

Table 3: Sprint Cycles

Scrum Artifacts

User Story No.	User Stories	User Story Priority	Status
SALES FORECASTING			
1	As a Finance Administrator the Researchers ensure marketing invoices are accurate before processing payments.	5	Ongoing
2	As a Finance Administrator, The Researchers want create accurate sales forecasts to guide financial planning.	5	Ongoing

3	As a Finance Administrator, The Researchers want generate monthly sales reports for management review.	3	Ongoing
4	As a Finance Employee, The Researchers want analyze sales trends to forecast future revenue.	5	Ongoing
5	As a Finance Employee, The Researchers want to receive weekly sales reports so that I can monitor revenue performance and identify trends.	4	Ongoing
BUDGETING			
6	As a Finance Administrator, The Researchers want to make a budgeting plan in finance.	5	Ongoing
7	As a Finance Employee, The Researchers want analyze sales trends to provide financial budget planning.	3	Ongoing

8	As a Finance Employee, The Researchers want set financial targets based on sales projections to drive company goals.	5	Ongoing
9	As a Finance Employee, The Researchers want set financial targets based on sales projections to drive company goals.	3	Ongoing
10	As a Finance Administrator, The Researchers want analyze the budgeting to be able to strategize or make budgeting decisions in order to track sales.	5	Ongoing
11	As a Finance Administrator, The Researchers want allocate salaries to employees to measure the payments of salaries.	5	Ongoing
COST MANAGEMENT			

12	As a Finance Administrator, The Researchers want to monitor the budget to ensure the objectives of cash and sales forecast.	5	Ongoing
13	As a Finance Employee, The Researchers want provide tools to control spending limits to budget financial goals.	3	Ongoing
14	As a Finance Employee, The Researchers want create management to track the budget to know marketing needs.	3	Ongoing
15	As a Finance Employee, I want the reporting feature to generate summaries of peak hours and busiest days to allocate resources more efficiently.	3	Ongoing
16	As a Finance Administrator, The Researchers want work closely with the sales and marketing teams to ensure that budgets align with revenue goals and market opportunities.	5	Ongoing

MONITOR CONTROL COST			
17	As a Finance Administrator, The Researchers want monitor and control expenses and report and analyze them properly.	5	Ongoing
18	As a Finance Administrator, The Researchers want identify high and low-performing products to refine sales forecasts.	5	Ongoing
19	As a Finance Employee, I want to provide a tool to review spending reports.	3	Ongoing
20	As a Finance Administrator, I want to create and monitor department budgets to control expenses.	3	Ongoing
PERFORMANCE TRACKING			
21	As a Finance Administrator, The Researchers want automate weekly sales reports and alerts to efficiently monitor revenue performance.	5	Ongoing
22	As a Finance Administrator, The Researchers want to verify the accuracy of vendor invoices before processing payments to maintain financial integrity.	3	Ongoing

23	As a Finance Administrator, The Researchers want to standardize the creation of monthly sales reports to facilitate management reviews and strategic discussions.	3	Ongoing
24	As a Finance Administrator, The Researchers want conduct variance analysis on quarterly budgets to monitor financial performance relative to sales forecasts.	5	Ongoing
25	As a Finance Employee, The Researchers want access real-time budget versus actual sales data to enhance decision- making regarding financial targets.	3	Ongoing
26	As a Finance Administrator, The Researchers want utilize financial analytics tools to assess historical sales trends and improve future revenue projections.	5	Ongoing

27	As a Finance Administrator, The Researchers want generate a comprehensive year-end financial report that evaluates sales performance against strategic objectives.	4	Ongoing
28	As a Finance Administrator, The Researchers want schedule regular review meetings with sales teams to discuss performance metrics and adjust financial strategies accordingly.	5	Ongoing
29	As a Finance Administrator, The Researchers want perform sensitivity analysis on financial forecasts to understand the impact of different sales scenarios on overall performance.	5	Ongoing
30	As a Finance Administrator, The Researchers want integrate performance tracking metrics with existing financial software to streamline reporting processes.	5	Ongoing

Table 4: Scrum Artifact

Product Backlog for EIS Information Security

User Story No.	**User Stories**	User Story Priority	Status
1	As a Finance administrator, I would like to implement access controls that specify who can use the system so that only authorized users can access critical data and capabilities. *User Restrictions* *Access Control*	2	Ongoing
2	As a Finance Administrator, I would also like to assure the details of the users with a view of protecting their privacy by encrypting their information and thus preventing other people from gaining access to it and misuse it. *Encryption for the profiles*	5	Ongoing

3	As a Finance Administrator, The Researchers want require users to create strong passwords that include special characters and numbers, so that their accounts are more secure against unauthorized access. *Strong password policy*	3	Ongoing
4	As a Finance Administrator, The Researchers want implement authentication for user logins, so that I can ensure that only legitimate users can access the scheduling system and manage their appointments. *Authentication for secure access*	4	Ongoing
5	As a system developer, The Researchers want monitor login attempts, so that I can send notifications for any unauthorized attempts to access user accounts, enhancing overall security. *Login attempts tracking*	5	Ongoing

Table 5: Product Backlog (EIS Information Security)

Product Backlog for EIS Standard

User Story No.	User Stories	User Story Priority	Status
1	As a Finance Administrator, I want the Sales Forecasting Service to automatically update when sales data changes, ensuring accurate estimates and informed budgeting decisions.	5	Ongoing
2	As a Finance Employee, I would like to get notifications about budget revisions so that I am aware of any changes that may impact my operations.	5	Ongoing
3	As a Finance Employee, I wish to access cost management solutions that provide accurate data.	5	Ongoing

4	As a Finance employee, The Researchers want receive automatic warnings about budget overruns so that I can take appropriate action to avoid financial risks.	5	Ongoing
5	As a Finance Administrator, I want the Monitor Control Cost Service to provide visual dashboards of cost trends, allowing me to discover patterns and alter tactics accordingly.	3	Ongoing
6	As a Finance Employee, The Researchers want view historical data on sales trends through the Sales Forecasting Service, so that I can better inform future budgeting and financial planning decisions.	5	Ongoing

Table 6: Product Backlog (EIS Standard)

UI/UX (Icons, color, etc.)

User Story No.	User Stories	User Story Priority	Status
1	As a Finance Administrator, I want icons that represent different financial metrics visually, so that data is easier to interpret at a glance.	3	Ongoing
2	As a Finance Employee, I want the dashboard layout to prioritize critical metrics and alerts at the top, so that I can quickly access the most important information.	5	Ongoing
3	As a Finance Administrator, I want the visual elements of budget allocation and spending reports to use distinct colors for different departments, so that I can easily track and compare their performance.	3	Ongoing

4	As a Finance Administrator, The Researchers want implement a consistent design pattern for buttons and navigation elements across modules, so that usability is enhanced and users have a seamless experience.	5	Ongoing
5	As a Finance Administrator, The Researchers want design notification banners that highlight important updates or alerts using eye- catching colors, so that users can respond to critical information promptly.	5	Ongoing

Table 7: UI/UX (Icon, Color, etc.)

Product Backlog for integration

User Story No.	User Stories	User Stories Priority	Status
1	As a Finance Employee, I want the sales forecasting feature to link with	5	Ongoing

	inventory levels, so that I can adjust forecasts based on stock availability.		
2	As a Finance Administrator, I want department budgets to integrate with payroll systems, so that I can ensure financial plans reflect employee compensation accurately.	3	Ongoing
3	As a Finance Administrator, I want the Logistics 1 and Logistics 2 systems to integrate seamlessly, so that I can enhance overall financial decision-making.	5	Ongoing

Table 8: Product Backlog (Integration)

Product Backlog for Analytics

User Story No.	**User Stories**	**User Stories Priority**	**Status**

1	As a Finance Administrator, The Researchers want track the average time taken to schedule, reschedule, or cancel appointments, so that I can improve the system's performance.	3	Ongoing
2	As a Finance Administrator, The Researchers want track how often citizens reschedule due to conflicts with department availability, so that I can improve availability coordination.	3	Ongoing
3	As a Finance Administrator, The Researchers want monitor real-time data on department availability to ensure efficient appointment scheduling.	5	Ongoing
4	As a Finance Administrator, The Researchers want analyze the types of questions and concerns citizens ask the AI assistant, so that I can improve the chatbot's knowledge base and responses.	5	Ongoing

Table 9: Product Backlog (Analytics)

EIS Analytics

User Story No.	User Stories	User Stories Priority	Status
1	As a Finance Administrator, The Researchers want view a dashboard displaying real- time (appointments booked, rescheduled, canceled), so I can monitor overall system performance.	5	Ongoing
2	As a Finance Administrator, The Researchers want view historical data on peak times and appointment loads, so I can optimize the allocation of resources.	3	Ongoing

3	As a Finance Administrator, The Researchers want analyze the number of appointments booked per department, so I can allocate resources effectively based on demand.	5	Ongoing
4	As a Finance Administrator, The Researchers want analyze how often the AI assistant is used for scheduling and rescheduling, so I can assess the impact of AI on overall system efficiency.	5	Ongoing

Table 10: EIS Analytics

Sprint Backlog

User Stories

User Story No.	User Stories	Task	User Story	Responsible Team Member

			Points (Hours)	
Sprint 1				
1	To view real-time availability for budget data.	Design UI	10hrs	Miranda, Jake Francis V.
		Design Data Model		
		Develop a workflow		
		Perform and Test		
2	Running and Debugging	Design UI	10hrs	Miranda, Jake Francis V.
		Design Data Model		
		Develop a workflow		
		Perform and Test		
3	To update system design.	Design UI	10hrs	Miranda, Jake Francis V.
		Design Data Model		
		Develop a		

		workflow		
		Perform and Test		
4	To ensure real-time availability is reliable during peak hours.	Design UI	Ongoing	Miranda, Jake Francis V.
		Design Data Model		
		Develop a workflow		
		Perform and Test		
Sprint 2				
5	To easily see allocated budget.	Design UI	10hrs	Miranda, Jake Francis V.
		Design Data Model		
		Develop a workflow		
		Perform and Test		
6	To be notified when data are updated.	Design UI	Ongoing	Rylbert M. Ganzan
		Design Data Model		

		Develop a workflow		
		Perform and Test		
7	To view availability when Forecasting.	Design UI	12hrs	Miranda, Jake Francis V.
		Design Data Model		
		Develop a workflow		
		Perform and Test		
8	To track historical data for budgeting.	Design UI	Ongoing	Rylbert M. Ganzan
		Design Data Model		
		Develop a workflow		
		Perform and Test		
9	To receive confirmation of	Design UI	Ongoing	Rylbert M. Ganzan
		Design Data Model		

	allocating budget.	Develop a workflow		
		Perform and Test		
Sprint 3				
10	To generate reports on Sales, Budgeting allocation and Payroll.	Design UI	Ongoing	Rylbert M. Ganzan
		Design Data Model		
		Develop a workflow		
		Perform and Test		
11	To track performance sales forecasting	Design UI	Ongoing	Miranda, Jake Francis V.
		Design Data Model		
		Develop a workflow		
		Perform and Test		
12	To provide visual reports	Design UI	Ongoing	Rylbert M. Ganzan
		Design Data		

		Model Develop a workflow Perform and Test		
13	To generate reports of peak hours and busiest days	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
Sprint 4				
14	To receive AI assistance in selecting the right department.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
15		Design UI	Ongoing	

	To implement the Machine learning tool.	Design Data Model Develop a workflow Perform and Test		Rylbert M. Ganzan
16	To get AI help with getting historical data.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
17	To test the AI Azure on common questions and issues.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
Sprint 5				

18	To see how sales improve through analytics.	Design UI Design Data Model Develop a workflow Perform QA and Test	10hrs	Miranda, Jake Francis V.
19	To select a specific department when getting data for budget.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
20	To see brief descriptions of each department's services.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan

21	To filter departments data.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
22	To manage and update information easily.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
23	To receive department recommendations based on previous data.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan

Table 11: Sprint Backlog (User Stories)

Information Security

User Story No.	User Stories	Task	User Story Points (Hours)	Responsible Team Member
1	User Restrictions Access Control	Design UI	Ongoing	Rylbert M. Ganzan
		Design Data Model		
		Develop a workflow		
		Perform QA and Test		
2	Authorization	Design UI	Ongoing	Rylbert M. Ganzan
		Design Data Model		
		Develop a workflow		
		Perform and Test		

3	Password Policy	Design UI Design Data Model Develop a workflow Perform QA and Test	Ongoing	Rylbert M. Ganzan
4	Authentication	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
5	Login Attempts	Design UI Design Data Model Develop a workflow Perform QA and Test	Ongoing	Rylbert M. Ganzan

Table 12: Sprint Backlog (Information Security)

EIS Standard

User Story No.	User Stories	Task	User Story Points (Hours)	Responsible Team Member
1	Update sales data in real-time.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
2	Confirmed budget and costing from different department	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan

3	Budget breakdown reports.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
4	Select department and see breakdown budget.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
5	AI guidance for gathering data and reports.	Design UI Design Data Model Develop a workflow Perform QA and Test	Ongoing	Rylbert M. Ganzan

6	Running and Debugging	Design UI Design Data Model Develop a workflow	Ongoing	Rylbert M. Ganzan

Table 13: Sprint Backlog (EIS Standard)

EIS Integration

User Story No.	User Stories	Task	User Story Points (Hours)	Responsible Team Member
1	Integrate Performance Tracking for Employee's Budget Payroll.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
2	Integrate department	Design UI Design Data	Ongoing	Rylbert M. Ganzan

	availability for budget costing.	Model Develop a workflow Perform and Test		

Table 14: Sprint Backlog (EIS Integration)

Analytics

User Story No.	User Stories	Task	User Story Points (Hours)	Responsible Team Member
1	Create a dashboard to view real-time monitoring system performance.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
2		Design UI Design Data	Ongoing	Rylbert M. Ganzan

	Create a dashboard to view historical data on peak times and present optimizing resource allocation	Model Develop a workflow Perform and Test		
3	Create a dashboard to analyze the number of budget request approval for each department for effective resource allocation.	Design UI Design Data Model Develop a workflow Perform and Test	Ongoing	Rylbert M. Ganzan
4		Design UI Design Data Model	Ongoing	Rylbert M. Ganzan

	Create a dashboard to analyze the usage frequency of the AI for gathering the historical and present data.	Develop a workflow Perform and Test		

Microservices Architecture

This was proposed microservices architecture for the Finance Management System effectively addresses sales forecasting, budgeting, cost management, allocated payroll, performance tracking, and monitor control cost needs. By modularizing functionalities into distinct microservices, the system can achieve flexibility, scalability, and improved user experience while maintaining security and efficiency in service interactions.

Key Components:

- Sales Forecasting Service: Manages the analysis and prediction of sales trends, providing insights to inform budgeting and financial planning.

- Budgeting Service: Facilitates the creation, management, and tracking of budgets, ensuring alignment with financial goals and sales forecasts.

- Cost Management Service: Monitors and controls costs associated with operations, providing tools for cost analysis and reporting.

- Allocated Payroll Service: Manages payroll allocation based on budgetary constraints and performance metrics, ensuring accurate compensation for employees.

- Performance Tracking Service: Tracks and analyzes performance metrics related to sales, budgeting, and cost management, providing insights for strategic decision-making.

- Monitor Control Cost Service: Provides tools for monitoring and controlling costs, ensuring adherence to budgetary limits and financial objectives.

This architecture allows for independent deployment and scaling of each service, enabling the finance management system to respond dynamically to changes in business needs and workloads.

System Microservices Architecture Diagram

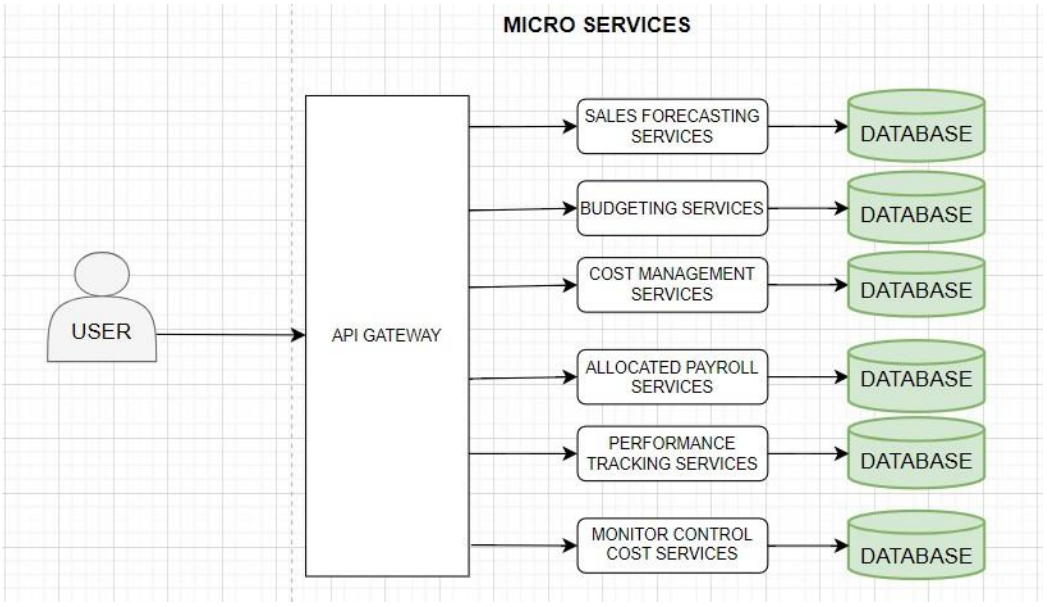

Figure 1: Microservices

SYSTEM NETWORK ARCHITECTURE

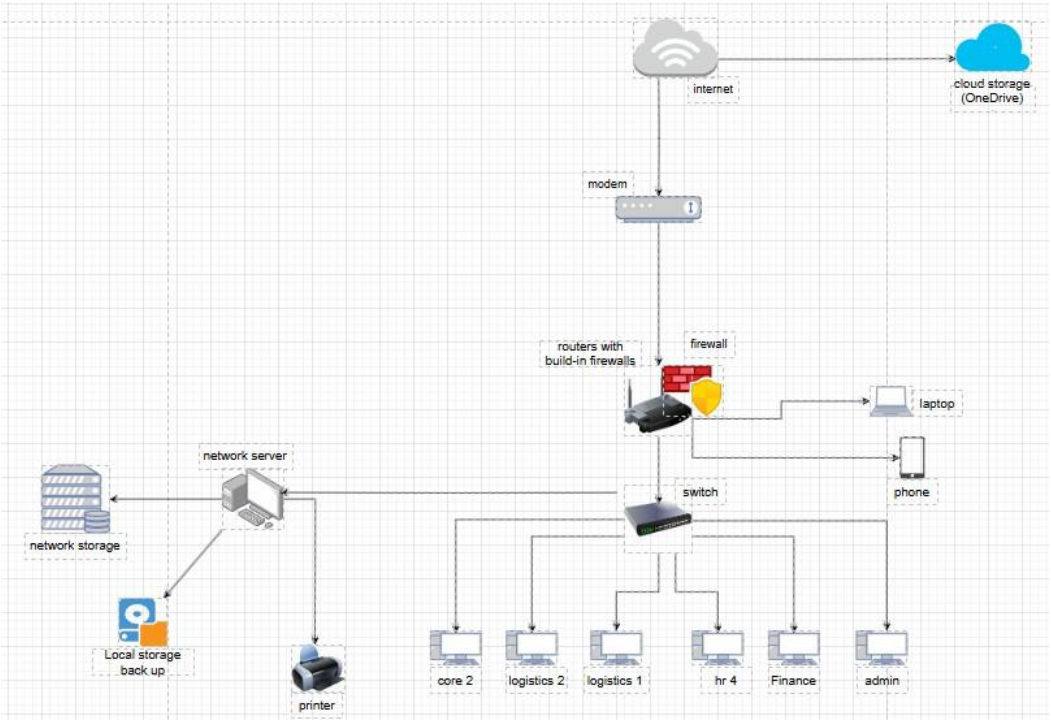

Figure 2: Network Architecture

This system uses a Star Topology due to its affordability and compatibility with smaller networks. This setup enables centralized control, allowing the server to manage resources efficiently, provide shared storage, and handle printer access. By linking departmental workstations, it reduces the risk of unauthorized access, and a router with built-in firewalls enhances security against external threats. Local backups and network storage add data redundancy, lowering the chances of data loss. The architecture is also scalable, allowing additional workstations and storage as needed. It offers high-speed performance by connecting devices directly to a central switch, which is advantageous for essential wired devices,

though wireless access is still available for mobile devices like laptops and smartphones. Services that require dedicated web hosting are also accessible to the public. This configuration is ideal for small to medium-sized businesses, as its clear hierarchical structure simplifies troubleshooting and reduces network congestion.

DATA FLOW DIAGRAM

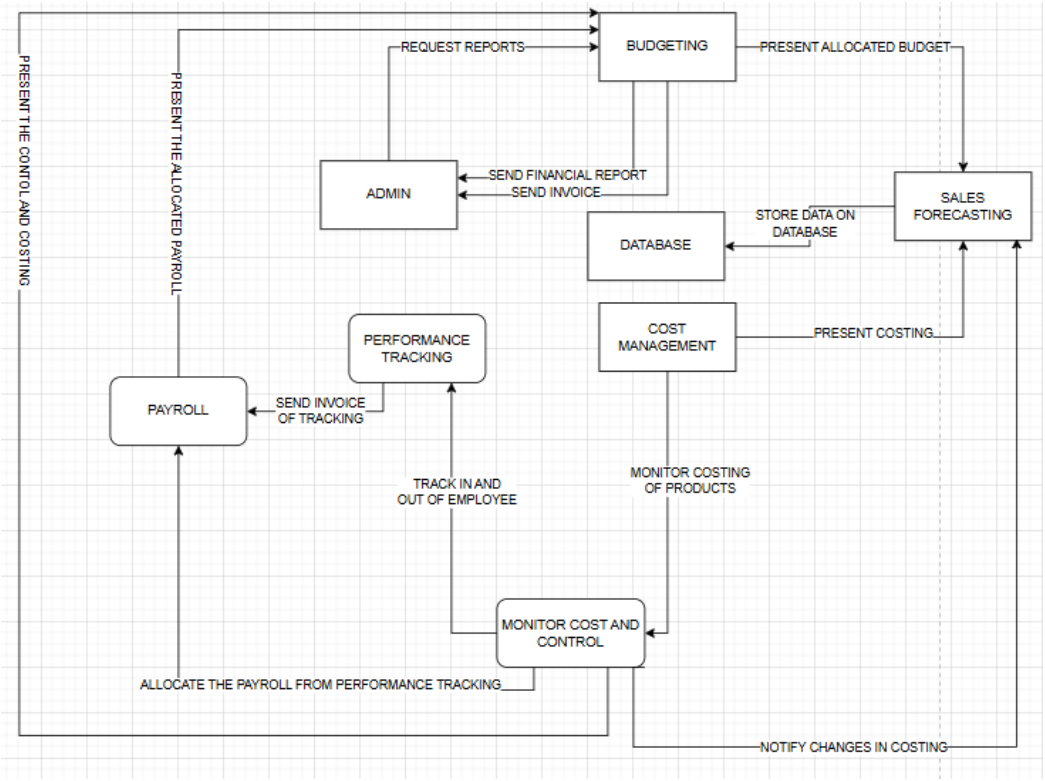

Figure 3: Data Flow Diagram

DevOps Implementation

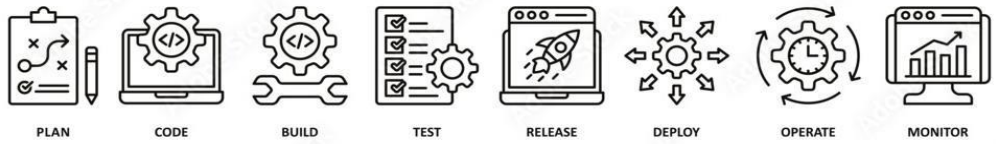

Figure 4: DevOpsPipeline

Innovation Integration

Logistics 1, Logistics 2, Core 1, and HR4 are being integrated into Finance as part of an effort to streamline financial processes and improve cost management across departments. This integration aims to create a centralized financial data platform, enabling visibility into logistics expenses, core transactions, and payroll costs. By automating budget control and approval workflows, Finance can more effectively monitor and adjust budgets in response to operational and staffing changes. Connecting sales forecasting with cost tracking facilitates proactive budget management, ensuring resources are allocated efficiently and budget overruns are minimized. Ultimately, this integration promotes data-driven decision-making and fosters a more agile and responsive financial management system within the organization.

BPA 1

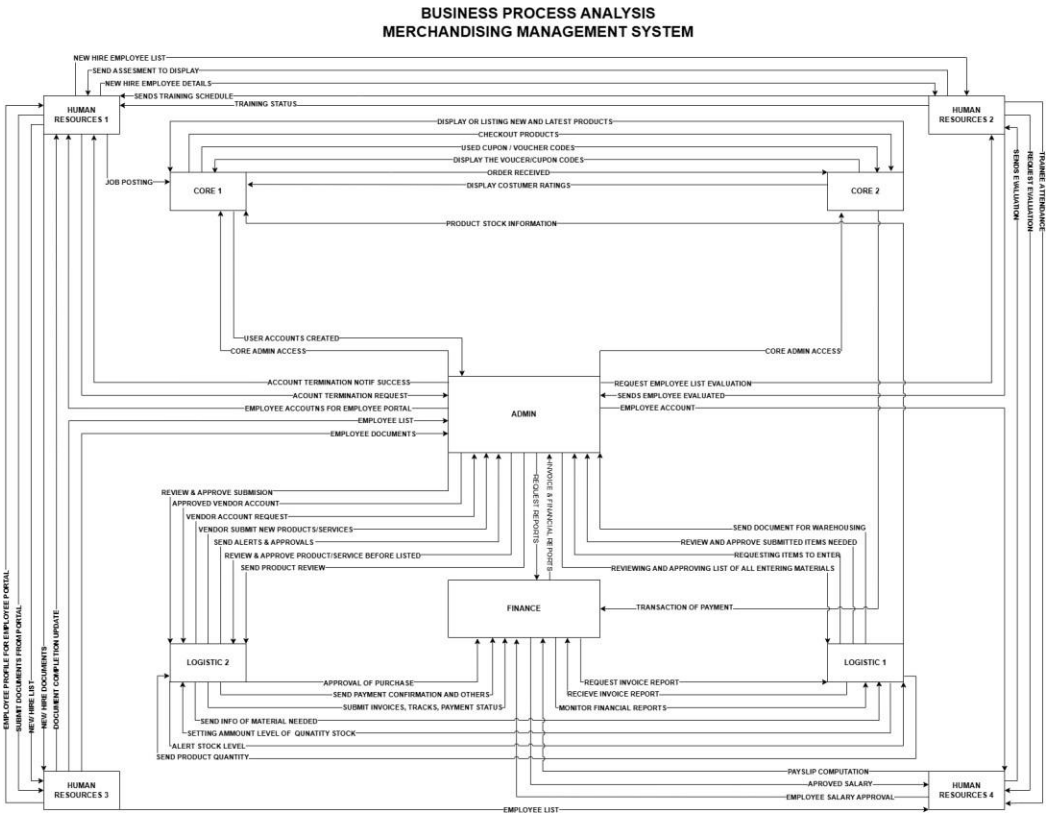

Figure 5: BPA Level 1

BPA 2

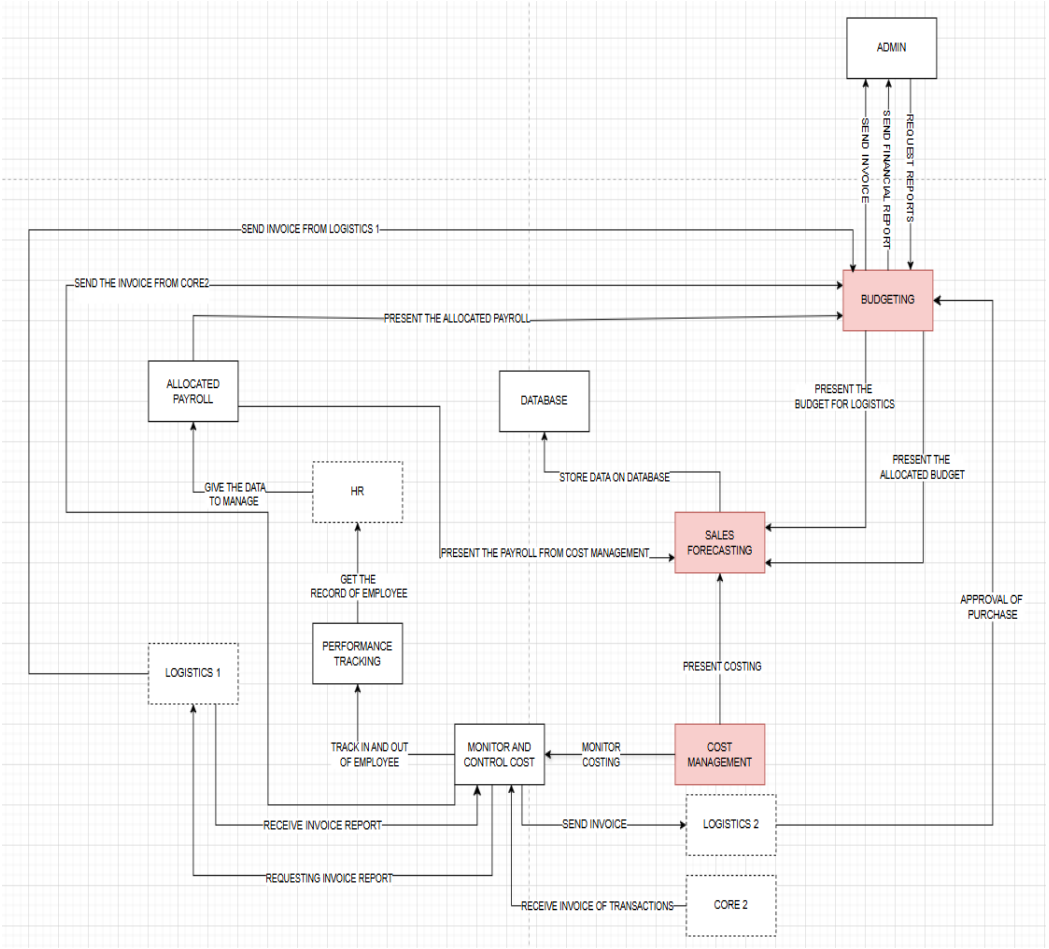

Figure 6: BPA Level 2

SEQUENCE DIAGRAM: ADMIN

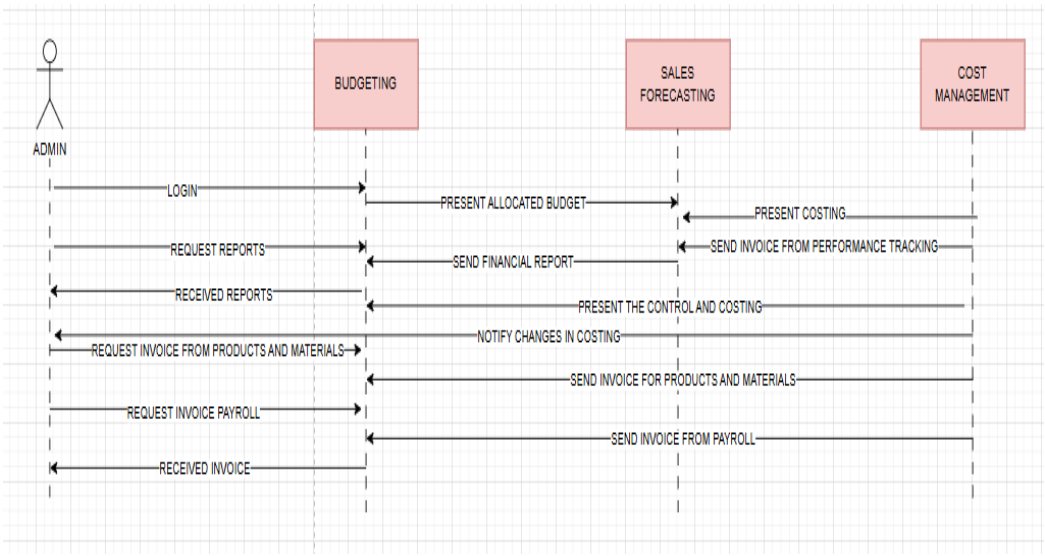

Figure 7: Sequence Diagram (Admin)

SEQUENCE DIAGRAM: EMPLOYEE

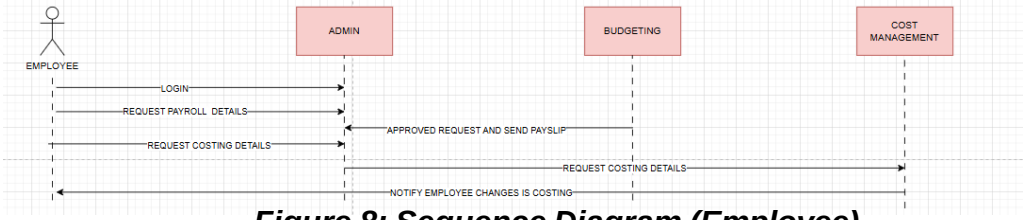

Figure 8: Sequence Diagram (Employee)