



Project Report/Seminar report On

Title

*Submitted in partial fulfillment of the requirements for the
award of the degree of*

Bachelor of Technology

in

Name of the Programme

By

Name (UID)

Under the guidance of

Name of the Guide

Name of the Department

Rajagiri School of Engineering & Technology (Autonomous)
(Parent University: APJ Abdul Kalam Technological University)

Rajagiri Valley, Kakkanad, Kochi, 682039

July 2023

CERTIFICATE

*This is to certify that the project report/seminar report entitled "**Title**" is a bonafide record of the work done by **Student Name (UID)**, submitted to the Rajagiri School of Engineering & Technology (RSET) (Autonomous) in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology (B. Tech.) in "Name of the Programme" during the academic year 20XX-20XX.*

Project Guide

Designation

Dept. Name

RSET

Project Co-guide

Designation

Dept. Name

RSET

Project Co-ordinator

Designation

Dept. Name

RSET

Name of HoD

Designation

Dept. Name

RSET

ACKNOWLEDGMENT

I wish to express my sincere gratitude towards **Name**, Principal of RSET, and "Name of HoD", Head of the Department of "Name of the Department" for providing me with the opportunity to undertake my project, "Project Title".

I am highly indebted to my project coordinators, **Name(s)**, Designation, Department, for their valuable support.

It is indeed my pleasure and a moment of satisfaction for me to express my sincere gratitude to my project guide **Name of Guide** for his/her patience and all the priceless advice and wisdom he/she has shared with me. I also express my sincere thanks to my co-guide(s), **Name of Co-Guide** for his/her support. (*Edit the contents accordingly*)

Last but not the least, I would like to express my sincere gratitude towards all other teachers and friends for their continuous support and constructive ideas.

Name of Student

Abstract

Insert your abstract here. The abstract should include a concise and clear description of the project work done. It should highlight the advantages of the project compared to existing works.

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List of Abbreviations

Acronym - Expansion

List of Figures

1.1	Insert your images here, and provide necessary captions.	1
2.1	Creating subfigures.	3

List of Tables

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Chapter 1

Introduction

Chapter introduction goes here.

1.1 Background

This section should outline the background of the project under consideration highlighting current scenarios and its importance. Maximum content is around 1 page [1].

1.2 Problem Definition

This section should mention the aim of the project. The problem should be defined in one or two sentences.



Figure 1.1: Insert your images here, and provide necessary captions.

1.3 Scope and Motivation

This section mentions scope and motivation, which should be written as two paragraphs. The first paragraph describes the scope, whereas the second one describes the motivation. Write in around 5 sentences each.

You may insert tables into your document using the given code:

Table 1.1: Insert table caption here

Title 1	Title 2	Title 3
1	Content 1	Content 2
2	Content 3	Content 4

1.4 Objectives

- This section should be a numbered list. Five to six objectives are encouraged.

1.5 Challenges

This section briefs the challenges involved in the project in two or three sentences.

1.6 Assumptions

This section briefs the assumptions in the project in two or three sentences or as a numbered list.

1.7 Societal / Industrial Relevance

This section describes where the project can be applied, either for the society or the industry. Write the relevance applicable for the work.

1.8 Organization of the Report

This section should outline a roadmap of the contents in the report.

Chapter conclusion goes here.

Chapter 2

Literature Survey

Chapter introduction goes here.

2.1 Section 1 Heading

Contents [2]



(a) First subfigure.



(b) Second subfigure.



(c) Third subfigure.

Figure 2.1: Creating subfigures.

2.2 Section 2 Heading

Contents

2.2.1 Subsection Heading

Contents

2.3 Summary and Gaps Identified

This is the most important section of Chapter 2. This subsection has two parts (i) summary and (ii) gaps identified. Summary can be a tabular form mentioning the advantages/disadvantages associated with each title. The gaps identified can be a numbered list of around four or five points mentioning what is lacking in the current state of art.

Chapter conclusion goes here. Here's a structured chapter in the form of **System Architecture** with sections and subsections corresponding to each component you've provided:

—

Chapter 3

System Architecture

This chapter describes the architecture of the system, outlining each component involved in creating an efficient demand forecasting and vendor collaboration platform. The system utilizes advanced machine learning and optimization techniques to support small-scale vendors by providing demand forecasting, order aggregation, and logistics optimization.

3.1 Dataset

The dataset is the foundation of the demand forecasting model, containing historical sales data at the store-item level. This data enables the platform to make informed predictions and optimizations.

3.2 Preprocessing

Data preprocessing is crucial to ensure that the dataset is clean, consistent, and ready for model training. This step includes handling missing values, standardizing date formats, and splitting data into training and testing sets.

3.3 Feature Extraction

Feature extraction involves deriving additional information from raw data to improve the model's predictive accuracy. The platform applies various feature engineering techniques to capture meaningful patterns in the dataset.

3.3.1 Time-Based Features

Time-based features include day-of-week, month, season, and holiday indicators. These features help capture temporal patterns and seasonality, which are important in predicting demand trends.

3.3.2 Lagged Variables

Lagged variables capture dependencies between current sales and past sales. These features are essential for understanding demand fluctuations and for integrating historical patterns into the forecasting model.

3.4 Demand Forecasting with Neural Prophet

Demand forecasting is achieved using the Neural Prophet model, which incorporates seasonality, trend components, and other covariates. This section outlines the implementation and configuration of the model to predict future sales.

3.5 Order Aggregation using Genetic Algorithm

Order aggregation is an optimization process using a Genetic Algorithm to combine multiple vendor orders. The aim is to meet minimum order quantities (MOQs) and maximize cost savings through bulk purchasing.

3.6 Logistics Optimization with Green Routing

The system's logistics optimization uses Green Routing techniques to reduce transportation costs and minimize environmental impact. This section details the two main components of the routing optimization.

3.6.1 Path Flexibility

Path flexibility allows for alternative routes within delivery schedules. It ensures efficiency in logistics by adapting routes to current traffic conditions and delivery requirements.

3.6.2 Service Time Window

Service time windows define acceptable delivery times for each location. This feature ensures timely delivery while optimizing route scheduling to meet vendor and customer needs.

3.7 Model Evaluation and Optimization

Model evaluation is performed using metrics like Mean Absolute Error (MAE) and Root Mean Square Error (RMSE) to ensure accurate predictions. Optimization steps are undertaken to enhance model performance.

3.7.1 Evaluation

This step involves assessing the model's accuracy and performance on validation data. Evaluation metrics help identify areas for improvement in the forecasting model.

3.7.2 Hyperparameter Tuning

Hyperparameter tuning uses techniques like grid search to optimize model parameters. The goal is to enhance prediction accuracy and generalization to new data.

3.7.3 Iterative Optimization

An iterative optimization process allows the model to continuously improve by refining feature engineering and adjusting model parameters based on feedback from performance metrics.

3.8 System Integration and Notifications

The system integrates each component to ensure seamless data flow and effective communication between users. Notifications inform vendors about important updates, such as order status, inventory levels, and delivery schedules.

This chapter has outlined the system architecture, providing a detailed view of each component's role in the platform's functionality. Together, these components create a cohesive system that supports demand forecasting, order aggregation, and efficient logistics management for vendors.

This structure integrates your sections and subsections while describing their purpose in the system's context. Let me know if you'd like additional details in any section!

Chapter 4

Chapter Heading

Chapter introduction goes here.

4.1 Section 1 Heading

Contents [3]

4.2 Section 2 Heading

Contents

4.2.1 Subsection Heading

Contents

Chapter conclusion goes here.

Chapter 5

Results and Discussions

Chapter introduction goes here.

5.1 Section 1 Heading

Contents

5.2 Section 2 Heading

Contents

5.2.1 Subsection Heading

Contents

Chapter conclusion goes here.

Chapter 6

Conclusions & Future Scope

This section describes the conclusion of the project in one page. Write one or two paragraphs.

In this section outline the future scope/extensions possible in the project in four or five sentences.

References

- [1] H. Garg and M. Dave, “Securing iot devices and securelyconnecting the dots using rest api and middleware,” in *2019 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU)*. IEEE, 2019, pp. 1–6.
- [2] Y. Xu, J. Zhang, Q. Zhang, and D. Tao, “Vitpose++: Vision transformer for generic body pose estimation,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2023.
- [3] “Deadly driver distractions,” December 2007. [Online]. Available: <http://www.driving.ca/news/story.html?id=93f2c537-f17e-4302-91b5-4ea6a544165c>

List of Publications

1. All the list of publications should be in IEEE Journal format as given in the references.
2. Publication 1
3. Publication 2

Appendix A: Presentation

Appendix B: Vision, Mission, Programme Outcomes and Course Outcomes

Vision, Mission, Programme Outcomes and Course Outcomes

Institute Vision

To evolve into a premier technological institution, moulding eminent professionals with creative minds, innovative ideas and sound practical skill, and to shape a future where technology works for the enrichment of mankind.

Institute Mission

To impart state-of-the-art knowledge to individuals in various technological disciplines and to inculcate in them a high degree of social consciousness and human values, thereby enabling them to face the challenges of life with courage and conviction.

Department Vision

Department Mission

Programme Outcomes (PO)

Engineering Graduates will be able to:

- 1. Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

- 5. Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and Team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Programme Specific Outcomes (PSO)

Course Outcomes (CO)

Appendix C: CO-PO-PSO Mapping

CO - PO Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
1												
2												
3												
4												
5												

CO - PSO Mapping

CO	PSO 1	PSO 2	PSO 3
1			
2			
3			
4			
5			

Justification

Mapping	Justification
CO1 - PO1	Reason
CO2 - PO2	Reason