



**PES UNIVERSITY**  
**Department of Computer Science and Engineering**  
**UE22CS341A: Software Engineering**

**Deliverable 1: Synopsis and SRS**

**Synopsis**  
*for*  
**Sales Analytics Dashboard**

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# 1. Introduction

## 1.1 Purpose

The Sales Analytics Dashboard project aims to develop a comprehensive software tool that empowers businesses to gain detailed insights into their sales data. By integrating various data sources, such as e-commerce platforms and CRM systems, the dashboard will extract, transform, and load (ETL) data into a centralized data warehouse. This powerful platform will provide users—ranging from business analysts to sales managers and executives—with interactive visualizations, robust reporting capabilities, and Online Analytical Processing (OLAP) functionalities. These features will enable efficient tracking and analysis of sales performance over time, across regions, and by product categories, supporting data-driven decision-making and strategic planning. As an essential asset, the Sales Analytics Dashboard will facilitate a deeper understanding of product popularity, customer segmentation, and overall sales metrics, driving informed decisions and business growth.

## 2. Literature Survey

### 2.1 Paper 1

- **Title:** Implementation of Business Intelligence for Sales Data Management Using Interactive Dashboard Visualization in XYZ Stores
- **Authors:** Ricky Akbar, Meza Silvana, Miftahul Jannah, Mohammad Hafiz Hersyah
- **Work Done:** This paper explores the development of a Business Intelligence (BI) system at XYZ Store to enhance sales data management through interactive dashboard visualization. The authors utilized the Pentaho Data Integration (PDI) tool for ETL processes and data warehouse design and deployed a BI tool for creating interactive visualizations. The study concluded that this BI implementation significantly improved managers' capabilities to generate reports and make informed decisions based on real-time data insights.
- **Link:** [IEEE Xplore](#)

### 2.2 Paper 2

- **Title:** ETL Processes for Integrating Big Data into Data Warehouses: Challenges and Trends
- **Authors:** A. Matheus, S. Bordbar, M. Schrefl
- **Work Done:** This study examines the challenges associated with ETL processes in managing big data, focusing on the difficulties posed by the volume, variety, and velocity of large datasets. It explores innovative ETL

techniques for effective integration of big data into data warehouses, aiming to optimize data extraction, transformation, and loading to support scalable and high-performance data warehousing solutions.

- **Link:** [MDPI](#)

### 2.3 Paper 3

- **Title:** Stationery Sales Analysis Using OLAP
- **Author:** Kyaw, Myat Myitzu
- **Work Done:** This system uses data warehousing and OLAP (On-Line Analytical Processing) to analyze sales records for a stationery shop, enabling better decision-making. By implementing a data warehouse, long-term storage from multiple sources is organized for effective management. OLAP tools provide multidimensional views and faster reports through pre-computed data cubes, supporting operations like roll-up, drill-down, slice, dice, and pivot. The system allows managers to view sales information across different time frames and categories, helping them generate insights quickly. It uses multidimensional data models like star, snowflake, and fact constellation schemas for efficient data analysis and decision support.
- **Link:** [Stationery Sales Analysis](#)

## 3. Problem Statement

Businesses struggle to effectively analyze and interpret large volumes of sales data due to fragmented data sources and the lack of a unified, robust analytics platform. This makes it difficult to gain real-time insights into sales performance, customer behaviour, and market trends. Without an integrated, interactive system for data visualization and analysis, decision-making becomes inefficient, strategic planning is hindered, and opportunities for business growth and competitiveness are often missed.

## 4. Objectives and Scope

### 4.1 Develop a User-Friendly Sales Analytics Dashboard

Create an intuitive and easy-to-use Sales Analytics Dashboard that provides comprehensive insights into sales performance, catering to the needs of business analysts, sales managers, and executives.

### 4.2 Implement ETL Pipelines

Design and implement ETL (Extract, Transform, Load) pipelines to efficiently extract data from CRM systems and e-commerce platforms, ensuring accurate and consistent data integration.

#### **4.3 Use Data Modeling Techniques**

Employ data modelling techniques, such as star schemas, to organize and structure sales data efficiently, optimizing the database for faster querying and analysis.

#### **4.4 Provide OLAP Capabilities**

Incorporate OLAP (Online Analytical Processing) functionalities to enable multidimensional analysis of sales data, allowing users to explore data from different perspectives.

#### **4.5 Enable Interactive Data Visualization**

Develop interactive visualizations, including dashboards and charts, that allow users to easily explore and understand sales trends and patterns in real-time.

#### **4.6 Ensure Data Security**

Implement robust security measures, including user authentication and access controls, to protect sensitive sales data and maintain data privacy.

#### **4.7 Build a Scalable System**

Design a scalable architecture that can accommodate growing volumes of sales data, ensuring the system remains responsive and efficient as data size increases.

### **5. Methodology**

#### **5.1 ETL Pipeline Development**

Extract sales data from multiple sources, normalize it, and load it into a relational database using a star schema.

#### **5.2 Data Modeling**

Design a star schema with a central fact table and multiple dimension tables for products, regions, and time periods. This structure will facilitate efficient querying and analysis.

#### **5.3 OLAP Implementation**

Develop OLAP functionalities to allow users to perform multidimensional analysis and custom views through pivot tables.

#### **5.4 Dashboard Design**

Use web technologies to create interactive dashboards featuring charts, graphs, and tables. Real-time data updates will be supported to reflect the latest sales information.

#### **5.5 Security and Compliance**

Implement data encryption, user authentication, and access controls to ensure the security and compliance of the system.

## **6. Expected Output**

6.1 A functional Sales Analytics Dashboard that provides real-time insights into sales performance.

6.2 Improved decision-making capabilities for business analysts, sales managers, and executives through detailed sales data analysis and visualization.

6.3 A secure, scalable platform that meets performance, usability, and reliability requirements.

6.4 A user-friendly interface catering to different user roles (business analysts, sales managers, executives).

## **7. Conclusion**

The development of the Sales Analytics Dashboard will provide businesses with a powerful tool for analyzing sales data, identifying trends, and making data-driven decisions. By leveraging modern data warehousing, ETL, OLAP, and visualization technologies, the system will offer a comprehensive solution for sales performance analysis. The project's successful implementation will support strategic planning, ultimately contributing to improved business performance.