رواد مصر الرقمية

وزارة الاتصـــــالات
وتكنولوجيا المعلومات

Odoo ERP Project

“ Pharmacy Data Analysis and Business Intelligence Dashboard”

Prepared by:

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❖ Project Planning and Management:

Project Proposal

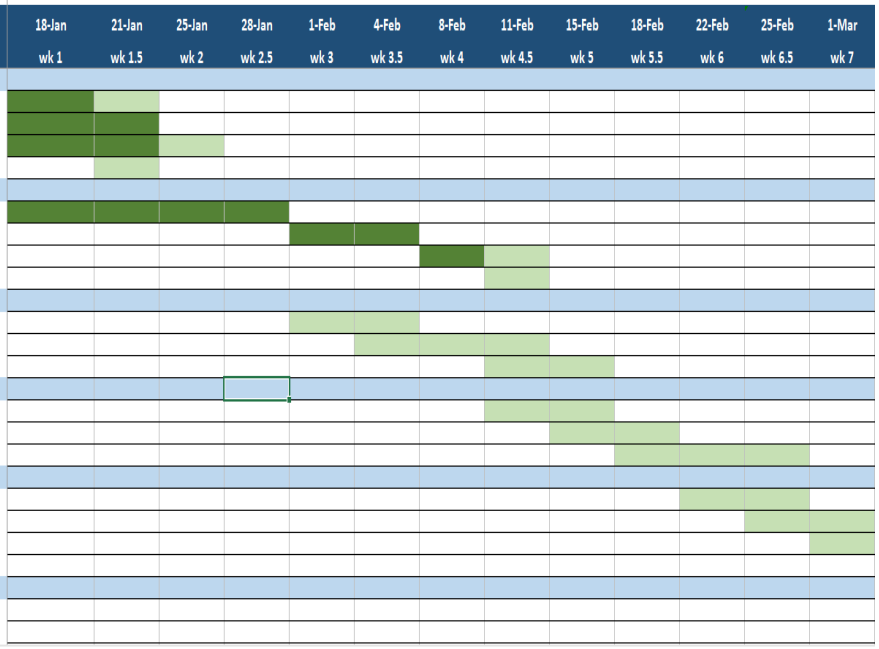
Project Title	• Pharmacy Data Analysis and Business Intelligence Dashboard
Project Overview	• This project aims to develop a business intelligence dashboard for pharmacy operations by extracting data from Odoo, storing and processing it in SQL, utilizing Python for ETL (Extract, Transform, Load), and building an interactive Power BI dashboard. The primary objective is to leverage data-driven insights to enhance decision-making, drive sales growth, improve operational efficiency, and support to know customer Behavior.
Objectives	• Extract and transform pharmacy transaction data from Odoo ERP into a structured SQL database. • Automate data integration using Python-based ETL processes. • Implement data validation and cleaning to ensure accuracy and consistency. • Develop a comprehensive Power BI dashboard for real-time analytics and reporting. • Provide actionable insights for sales trends, inventory management, and customer behavior.
Scope of Work	• Extract pharmacy transactions and inventory data from Odoo ERP. • Use Python scripts to automate data extraction and transformation. • Store structured data in a SQL database for further analysis. • Implement ETL validation scripts. • Automate the data pipeline for scheduled updates. • Connect Power BI to the SQL database for real-time insights. • Build interactive visualizations. • Conduct end-user training sessions to ensure smooth adoption of the Dashboard, Video tutorials for dashboard usage and documentation reference. • Deliver a final presentation to stakeholders highlighting insights and functionality.

Project Plan

Timeline And Gantt Chart

Project Name:	Pharmacy Business Intelligence Dashboard
Start Date:	1/18/2025
Cuurent Date:	2/22/2025
Current Week:	wk 5

Milestone/Task	Task Lead	Start Date	End Date	Days	Progress
Project Initiation					
Define objectives, scope,	Omar	18-Jan	22-Jan	4	30%
dentify stakeholders and reporting needs	Dalia	19-Jan	22-Jan	3	70%
Develop a project plan	Zain	20-Jan	25-Jan	5	50%
Define KPIs	Asmaa	22-Jan	24-Jan	2	20%
Data Setup & Connection					
evelop Python script to connect Odoo to SI	Sarah	18-Jan	31-Jan	13	100%
Extract and store Odoo data into SQL	Omar	1-Feb	6-Feb	5	100%
Automate incremental data updates	Asmaa	8-Feb	12-Feb	4	30%
Test data consistency & error handling	Hagar	13-Feb	13-Feb	0	10%
Data Processing					
rite SQL queries for structuring and analys	Asmaa	1-Feb	6-Feb	5	0%
entify new attributes and calculated fiel	Zain	7-Feb	11-Feb	4	0%
Optimize SQL queries for performance	Dalia	12-Feb	16-Feb	4	0%
Data Cleaning					
Connect Power BI to SQL	Sarah	12-Feb	17-Feb	5	0%
ansform and clean data using Power Que	Omar	15-Feb	20-Feb	5	0%
lle missing values and format inconsiste	Hager	21-Feb	25-Feb	4	0%
Dashboard Development					
Design dashboard layout and KPIs	Asmaa	23-Feb	27-Feb	4	0%
Create interactive visualizations	Zain	28-Feb	5-Mar	5	0%
Implement DAX calculations	Asmaa	1-Mar	15-Mar	14	0%
Test dashboard performance	Dalia	11-Mar	13-Mar	2	0%
Deployment & Handover					
Deploy dashboard and schedule refresh	Omar	14-Mar	19-Mar	5	0%
Train end-users	Hager	17-Mar	22-Mar	5	0%



Milestones

Milestone	Completion Date	Description
Project Initiation	24-Jan	Define objectives, identify stakeholders, develop a project plan, and set KPIs.
Data Setup & Connection	13-Feb	Develop Python scripts, extract Odoo data into SQL, automate updates, and ensure data consistency.
Data Processing	16-Feb	Write SQL queries for structuring, identify calculated fields, and optimize query performance.
Data Cleaning	25-Feb	Connect Power BI to SQL, clean data using Power Query, and handle missing values.
Dashboard Development	13-Mar	Design dashboard layout, create interactive visualizations, implement DAX calculations, and test performance.
Deployment & Handover	25-Mar	Deploy dashboard, schedule refresh, train end-users, and provide documentation.
Monitoring	30-Mar	Ensure Python script runs on schedule, monitor Power BI refresh, and optimize dashboards.
Project Presentation	11-Apr	Present the project to stakeholders.

▪ Deliverables

Deliverable Name	Description	Related Milestone
Project Scope Document	Document outlining the project objectives and scope.	Project Planning Completed
Project Plan	Detailed plan with tasks, roles, and timeline.	Project Planning Completed
Python Script for Odoo Connection	Script to connect Odoo to SQL for data extraction.	Data Connection Established
SQL Queries for Data Processing	Structured SQL queries and performance-optimized calculations.	Data Processing Completed
Power BI Connection	Power BI connected to SQL for real-time reporting.	Data Cleaning Completed
Dashboard Design	Dashboard layout and visualizations.	Dashboard Developed
Final Dashboard & Visualizations	Fully developed dashboard with DAX calculations.	Dashboard Developed
Deployment Report	Deployment report with testing and validation results.	Project Deployment
Training & Documentation	User documentation and recorded training materials.	Project Deployment
Project Presentation Slides	Slides summarizing the project outcomes and insights.	Project Presentation

▪ Resource

- **Software Resource**

Software	Purpose	Usage
Odoo ERP	Data Source	Extract transaction & inventory data
SQL Database	Data Storage	Store and manage structured data
Python (Pandas, SQL Alchemy)	ETL Development	Automate data extraction and transformation
Power BI	Dashboard Development	Data visualization and reporting
Excel	Project Management	Organizing tasks, milestones, and data validation
PowerPoint	Presentation	Project presentation and training materials

Task Assignment and Roles

Task	Assigned To	Start Date	End Date
Define objectives, scope	Omar	18-Jan	22-Jan
Identify stakeholders and reporting needs	Dalia	19-Jan	22-Jan
Develop project plan	Zain	20-Jan	25-Jan
Define KPIs	Asmaa	22-Jan	24-Jan
Develop Python script for Odoo-SQL	Sarah	18-Jan	31-Jan
Extract and store Odoo data in SQL	Omar	1-Feb	6-Feb
Automate incremental data updates	Asmaa	8-Feb	12-Feb
Test data consistency & error handling	Hagar	13-Feb	13-Feb
Write SQL queries for analysis	Asmaa	1-Feb	6-Feb
Identify new attributes & calculated fields	Zain	7-Feb	11-Feb
Optimize SQL queries	Dalia	12-Feb	16-Feb
Connect Power BI to SQL	Sarah	12-Feb	17-Feb
Transform & clean data using Power Query	Omar	15-Feb	20-Feb
Handle missing values & inconsistencies	Hagar	21-Feb	25-Feb
Design dashboard layout & KPIs	Asmaa	23-Feb	27-Feb
Create interactive visualizations	Zain	28-Feb	5-Mar
Implement DAX calculations	Asmaa	1-Mar	15-Mar
Test dashboard performance	Dalia	11-Mar	13-Mar
Deploy dashboard	Omar	14-Mar	19-Mar
Train end-users	Hagar	17-Mar	22-Mar
Create PDF documentation	Zain	20-Mar	24-Mar
Record video tutorial	Hagar	20-Mar	25-Mar
Ensure Python script runs on schedule	Asmaa	25-Marr	28-Mar
Monitor Power BI refresh	Dalia	26-Mar	29-Mar
Optimize queries and dashboards	Hager	27-Mar	30-Mar
Training all team on Presentation	All Team Members	1-Apr	8-Apr
present the project	All Team Members	10-Apr	11-Apr

Risk Assessment And Mitigation Plan

Risk Category	Risk Description	Potential Impact	Likelihood	Mitigation Strategy
Data Integrity & Security	Accidental data deletion while connecting Odoo to SQL via Python	Loss of critical pharmacy data.	**High**	Implement backups before sync, use a read-only user for initial testing, and log all operations.
Data Integrity & Security	Data inconsistency in Odoo (incorrect/missing fields)	Wrong insights in analysis.	**High**	Apply data validation rules before import and schedule regular data audits.
SQL & Data Processing	SQL database integrity issues (duplicates, missing records)	Data corruption. Incorrect reports.	**Medium**	Use Primary Keys, Constraints, and run ETL validation scripts.
SQL & Data Processing	Poor database indexing affects performance	Slow dashboard response.	**High**	Apply indexing strategies, optimize SQL queries, and use stored procedures where applicable.
Power BI Dashboard	Incorrect visualizations due to data mismatch	Misleading insights.	**High**	Validate reports against raw SQL data, conduct manual verification before release.
Project Timeline & Delivery	Couldn't match project timeline	Delayed delivery. Missed deadlines.	**High**	Use agile sprints, set milestone checkpoints, and reallocate resources if needed. Prioritize critical tasks first.
Project Management Risks	Lack of documentation	Future maintenance issues.	**Medium**	Maintain a data flow diagram, system architecture docs, and process documentation.

Key performance Indicators (KPIs)

category	KPI	Description	Target
Dashboard Accuracy	Data Consistency Rate	Reports with accurate & validated data	≥ 98%
User Adoption	User Engagement Rate	Intended users actively using the dashboard	≥ 80%
User Adoption	Training Completion Rate	Users who complete dashboard training	≥ 90%
Business Insights	Decision Support Impact	Users who find insights useful for decisions	≥ 85%
Business Insights	Sales Trend Analysis	Accuracy of sales forecasts using dashboard	≥ 95%
Project Timeliness	Milestone Adherence Rate	% of milestones met on time	≥ 90%
Project Timeliness	Task Completion Rate	% of project tasks finished within schedule	≥ 95%

❖ Requirements Gathering:

1. Stakeholder Analysis

Identifying key stakeholders and their needs:

- **Pharmacy Management:** Requires real-time insights into sales trends, stock levels, and demand forecasting to optimize procurement and reduce stockouts.
- **Data Analysts:** Need structured, cleaned, and well-organized data to perform deep analytics, trend identification, and predictive modeling.
- **Suppliers & Logistics Team:** Require inventory movement reports to streamline supply chain operations and reduce overstock or shortages.
- **Finance & Accounting Team:** Need financial reports on revenue patterns, profitability, and expense tracking.
- **IT & System Administrators:** Require a robust, secure, and scalable data pipeline to ensure smooth data flow between Odoo, SQL, and Power BI.

2. User Stories & Use Cases

User Stories:

1. **As a Pharmacy Manager**, I want a dashboard that provides real-time stock levels so I can make timely restocking decisions.
2. **As a Data Analyst**, I want access to structured and clean sales data to analyze trends and customer purchasing behavior.
3. **As a Finance Officer**, I need monthly revenue reports to assess financial performance and identify growth opportunities.
4. **As a Supplier**, I need accurate order forecasts based on historical sales and seasonality trends to optimize distribution.
5. **As a System Administrator**, I want to ensure that data synchronization between Odoo and SQL happens automatically and without errors.

Use Case Example: Monitor Stock Levels

- **Use Case Name:** Monitor Stock Levels
- **Actors:** Pharmacy Manager
- **Preconditions:** System is connected to Odoo and SQL, and Power BI dashboards are updated.
- **Steps:**
    1. Open Power BI dashboard.
    2. View real-time stock levels categorized by medicine type.
    3. Identify medicines with low stock thresholds.
    4. Generate a purchase order recommendation based on sales trends.
    5. Export data for supplier communication.

3. Functional Requirements

- **Data Extraction & Storage:**
  - Extract sales, inventory, and prescription data from Odoo and store it in a structured SQL database.
  - Automate data synchronization using Python scripts.
- **Data Processing & Cleaning:**
  - Transform raw data into structured formats suitable for analysis.
  - Handle missing, duplicate, and inconsistent data using Power Query.
- **Dashboard & Report Generation:**
  - Develop Power BI dashboards for stock management, sales trends, and demand forecasting.
  - Generate automated reports for pharmacy management and finance teams.
- **User Access & Security:**
  - Implement role-based access control (RBAC) to ensure that only authorized users can access sensitive data.
  - Ensure secure connections between Odoo, SQL, and Power BI.
- **System Automation & Scheduling:**
  - Enable daily automated data refresh to keep insights up to date.
  - Implement alerts for critical stock levels and anomalies in sales data.

4. Non-Functional Requirements

- **Performance:** The system should handle large datasets efficiently, ensuring query execution time remains under 5 seconds.
- **Security:** Implement encryption for data transmission and enforce access restrictions based on user roles.
- **Usability:** Power BI dashboards should have an intuitive UI with easy-to-navigate reports.

❖ System Analysis & Design :

Problem Statement

Pharmacies generate vast amounts of sales and inventory data, but without proper analysis, valuable insights remain untapped. Manual reporting methods are time-consuming, error-prone, and lack real-time visibility into sales trends, customer behavior, and inventory management. This leads to inefficiencies such as stockouts, overstocking, missed sales opportunities, and difficulties in strategic decision-making. Additionally, the absence of a centralized business intelligence system makes it challenging to track performance metrics and optimize operations. This project addresses these challenges by leveraging Odoo ERP, SQL, Python-based ETL processes, and Power BI to create an interactive dashboard that provides real-time insights and supports data-driven decision-making.

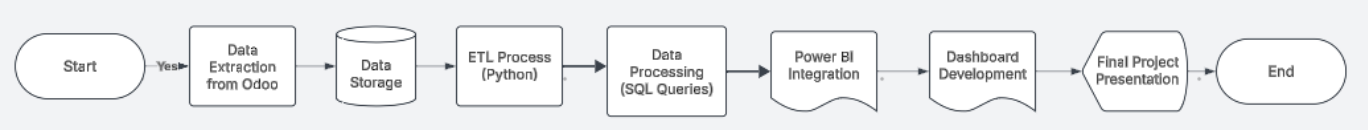
The Main Problem Statement:

1. **Inventory Management** – Prevent stock outs and overstocking through real-time monitoring.
2. **Sales Improvement** – Optimize sales by identifying trends and customer purchasing behavior.

Project Objectives

1. **Data Extraction & Integration:** Extract and transform pharmacy transaction and inventory data from Odoo ERP into a structured SQL database.
2. **Automated ETL Process:** Develop Python scripts for automated data extraction, transformation, and scheduled updates.
3. **Data Accuracy & Consistency:** Implement data validation and cleaning techniques to ensure high-quality, reliable data.
4. **Business Intelligence Dashboard:** Design and develop an interactive Power BI dashboard for real-time analytics and reporting.
5. **Sales & Inventory Insights:** Provide actionable insights into sales trends, customer purchasing behavior, and inventory optimization.
6. **Performance Monitoring:** Track and analyze key performance indicators (KPIs) to measure business growth and efficiency.
7. **User Training & Adoption:** Conduct training sessions and provide documentation to ensure effective use of the dashboard by end-users.

Data Flow & System Behavior:



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Business Performance Analysis & Inventory Management

Business Performance Analysis: Sales trends, branch comparisons.

1. **Sales Growth Trends**
   - Measure total sales growth across the entire chain for 2024.
   - Evaluate sales growth per branch for 2024.
2. **Branch Performance & Sales Distribution**
   - Identify **top-selling branches** for **Pareto** items.
   - Determine **top-selling branches** for **Class A** items.
   - Identify branches with **zero sales** in the **last three months**, categorized by:
     - **Pareto vs. non-Pareto** items.
     - **Class (A, B, C, D)** items.
   - Calculate the **percentage of zero-sales items per branch** and classify them as:
     - **High (Above 10%)**.
     - **Moderate (5% to 10%)**.
     - **Low (Below 5%)**.

Product Classification & Performance: Pareto analysis, sales-based classification.

3. **Pareto & Sales-Based Classification**
   - Identify **Pareto items** based on **value and sales quantity** over the last **three months**:
     - Mark **Pareto items** with **R**.
     - Mark **Non-Pareto items** with **K**.
   - Assign **Class (A, B, C, D)** labels to both **Pareto** and **Non-Pareto** items.
4. **Item Performance Evaluation**
   - Categorize items into **Classes (A, B, C, D)** based on sales frequency over the last **three months**:
     - **Class A**: Sold **3 times or more**.
     - **Class B**: Sold **twice**.
     - **Class C**: Sold **once**.
     - **Class D**: Not sold at all.

Inventory Management & Optimization: – Ideal stock levels.

5. **Stock & Supply Chain Efficiency**
   - Determine the **optimal stock levels** for each item based on sales over the last **three months**, ensuring inventory sufficiency for **at least 30 days**.

UI/UX Design: color scheme