Component 1: Basic Idea and Problem Statement

Theme: Data / Business Analytics
Project Title:
AI-Driven Customer Insights and Sales Forecasting for Small E-Commerce Businesses

1. Basic Idea

Small e-commerce businesses often struggle to analyse their sales patterns, understand customer behaviour, and predict future demand due to limited analytical expertise and lack of advanced tools. This project aims to develop an AI-assisted analytics prototype that transforms raw sales and customer data into meaningful insights.

The solution will combine Generative AI tools with business analytics techniques to create a functional workflow that includes automated data generation, exploratory analysis, customer segmentation, and sales forecasting. The final prototype will demonstrate how AI can support better decision-making, improve operational planning, and increase revenue for small online sellers.

2. Problem Statement

Small e-commerce sellers generate customer and sales data every day, but most of them do not possess the resources, time, or skills to analyse this information effectively. They face several challenges:

- Lack of clarity on which products perform well or poorly
- Inability to forecast demand accurately
- No structured understanding of customer segments
- Difficulty identifying marketing opportunities and repeat-purchase behaviour
- Limited capability to convert data into actionable decisions

Without proper analytics support, these businesses rely heavily on intuition, resulting in stock mismanagement, inefficient promotions, and missed opportunities for growth. There is a clear need for a simple, AI-enabled solution that provides accessible insights, reliable forecasts, and data-driven recommendations.

3. Purpose of the Project

The purpose of this project is to design an end-to-end, AI-enhanced business analytics prototype that enables small e-commerce retailers to:

- Analyse sales trends and patterns
- Identify profitable customer segments
- Forecast future sales using AI-generated predictions
- Recognise product-level growth opportunities
- Improve marketing and inventory planning

- Make faster, evidence-based business decisions

The project showcases how Generative AI can enhance traditional analytics workflows by simplifying complex tasks and enabling non-technical business owners to leverage data effectively.

4. Expected Impact

The proposed system is expected to create measurable improvements for small e-commerce businesses by:

- Increasing accuracy in sales forecasts and demand planning
- Enhancing understanding of customer segments and purchasing behaviour
- Improving marketing targeting and promotional strategies
- Assisting in inventory decisions by identifying top and low performers
- Saving time and effort through automated AI-driven insights
- Strengthening overall data-driven decision-making capabilities

5. Preliminary Tools

The following tools will be used to construct, analyse, visualise, and present the project outputs:

Data & Analysis Tools

- **Microsoft Power BI:** For interactive dashboards and visual analytics
- **Google Sheets:** For dataset cleaning, organisation, and basic preprocessing
- **Jupyter Notebook (AI-assisted):** Minimal-code exploration using step-guided prompts

AI Tools

- **ChatGPT (Advanced Data Analysis):** For synthetic data creation, EDA, forecasting, segmentation, and insight extraction
- **GitHub Copilot:** For AI-assisted code suggestions during analysis (simple, low-code tasks)
- **GitHub:** For version control, documentation, and storing project artefacts
- **Canva AI:** For creating visual elements for the final presentation
- **Sora AI (if applicable):** For generating short conceptual videos to support the pitch