

Project Initialization and Planning

Phase

Date	3 May 2024
Team ID	737906
Project Title	Walmart Sales Analysis for Retail Industry with Machine Learning
Maximum Marks	3 Marks

Project Proposal (Proposed Solution):

Enhancing Customer Experience through Improved Sales Prediction at Walmart

Project Overview	
Objective	The project aims to develop an advanced predictive model for Walmart stores, addressing customer frustrations related to inconsistent product availability, particularly during holidays and seasonal shifts. By considering factors such as store size, temperature variations, specific dates, and holiday patterns, the model will provide more accurate sales forecasts, ultimately enhancing the shopping experience for customers.
Scope	<ol style="list-style-type: none"> 1. Data Collection: Gather historical sales data from Walmart stores, including store size, temperature, dates, and holiday information. 2. Model Development: Utilize machine learning techniques to develop a predictive model considering store-specific factors for accurate sales forecasts. 3. Evaluation Metrics: Assess model performance using metrics like mean absolute error (MAE) and root mean squared error (RMSE). 4. Implementation: Integrate the developed model into Walmart's operational environment for inventory management. 5. Stakeholder Communication: Maintain regular communication with stakeholders for updates and feedback. 6. Training and Support: Provide training to staff on model interpretation and decision-making based on forecasts. 7. Continuous Improvement: Monitor and refine the model over time

	to adapt to changing conditions and improve accuracy
Problem Statement	
Description	Walmart department store customers encounter challenges related to inconsistent product availability, especially during holidays and seasonal shifts. These issues arise from inaccurate sales forecasts influenced by factors such as store size, temperature variations, dates, and holiday patterns. Developing a robust predictive model that considers these variables will enable Walmart to better anticipate customer demand, ensuring shelves are adequately stocked with the right products at the right times, thereby improving the overall shopping experience for customers.
Impact	The impact of addressing the problem statement is multifaceted. Firstly, it leads to an improved customer experience at Walmart stores, characterized by consistently stocked shelves and smoother shopping experiences, resulting in heightened customer satisfaction. Secondly, the implementation of accurate sales predictions enhances operational efficiency by optimizing inventory management and reducing associated costs. This efficiency translates into increased sales and revenue for Walmart, as satisfied customers are more likely to make purchases. Lastly, the availability of reliable sales forecasts enables Walmart to make strategic decisions regarding inventory, staffing, and promotional strategies, further contributing to the company's success and competitiveness in the retail industry.
Proposed Solution	
Approach	The project will involve collecting historical sales data from Walmart stores, along with relevant variables such as store size, temperature data, dates, and holiday information. Machine learning techniques will be employed to develop a predictive model that considers these factors to forecast sales accurately. Model performance will be evaluated using metrics such as mean absolute error and root mean squared error.
Key Features	The proposed solution encompasses key features essential for addressing the problem statement effectively. It begins with comprehensive data integration, combining diverse datasets such as historical sales records, store-specific details, temperature variations, dates, and holiday patterns. Advanced predictive modeling techniques tailored to the retail domain are employed, incorporating store-specific factors to develop precise sales forecasting models. Robust evaluation metrics like mean absolute error (MAE) and root mean squared error (RMSE) ensure the accuracy and reliability of the

	<p>predictions. Real-time implementation of the developed models within Walmart's operational environment enables timely decision-making, particularly in inventory management and customer service. Continuous improvement mechanisms are established to monitor and refine the models, ensuring adaptability to changing business conditions and ongoing enhancement of forecast accuracy. Stakeholder engagement is prioritized through regular communication and collaboration, facilitating alignment with business objectives and the incorporation of feedback into model development and implementation processes.</p>
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Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	12th Gen Intel(R) Core(TM) i7-1255U, 10 Core(s)
Memory	RAM specifications	16 GB
Storage	Disk space for data, models, and logs	512 GB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	scikit-learn, pandas, NumPy, Datetime, flask
Development Environment	IDE, version control	e.g., visual studio code, Git
Data		
Data	Source, size, format	Kaggle dataset, 10,000 images