

**Business Problem:**

The company faces inefficiencies in its bonus allocation process, leading to suboptimal use of resources and customer dissatisfaction. The current method does not align bonus distribution with key performance indicators (KPIs) and business goals, resulting in higher costs and lower customer motivation. An efficient system is needed to allocate bonuses that maximize customer performance and satisfaction while staying within budget constraints.

**Business Objective:**

1. Maximize customer satisfaction.
2. Minimize variance in bonus distribution.

**Business Constraint:**

- Maximize fairness in bonus distribution.

**Success Criteria:**

- **Business Success Criteria:** Achieve a 10% increase in profit margins through optimized bonus allocation.
- **Machine Learning Success Criteria:** Achieve an accuracy of at least 95%.
- **Economic Success Criteria:** Generate a 20% increase in revenue from the solution within the first year of implementation.

## **Project Steps for Optimizing Bonus Allocation**

### **Initial Steps**

#### **1. Project Documentation**

- Fill out the CRISP MLQ (CRoss-Industry Standard Process for Data Mining) and project charter.

#### **2. Research the Domain**

- Conduct initial research on the topic of bonus allocation, customer satisfaction, and relevant machine learning techniques.
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### **Data Collection and Feature Engineering**

#### **3. Collect Research Papers**

- Gather at least ten research papers related to bonus allocation and machine learning.

#### **4. Identify Relevant Features**

- Based on research, identify features that are relevant to your bonus allocation model (e.g., customer performance indicators).

#### **5. Dataset Research**

- Investigate existing datasets or methods to create a new dataset relevant to your problem statement.
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### **Data Preparation**

#### **6. Generate Synthetic Data**

- Use Google and YouTube to find methods for creating synthetic datasets.
- Create a synthetic dataset that includes specified features (e.g., customer name, ID, age, transaction details, etc.).
- Ensure that you have a minimum of 1,000 records.

#### **7. Finalize Dataset**

- Confirm that the dataset includes all required features and meets the project specifications.

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## **Preprocessing and Exploratory Data Analysis (EDA)**

### **8. Perform Data Preprocessing**

- Handle missing values, outliers, and clean the data as necessary.

### **9. Conduct Exploratory Data Analysis (EDA)**

- Perform EDA to inspect data distribution, relationships between features, and overall data quality.
- Check for zero variance columns, perform outlier analysis, and assess the normality of the data.

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## **Model Building**

### **10. Complete EDA and Move to Modeling**

- Ensure EDA is complete, including handling outliers and confirming data quality.

### **11. Build Predictive Models**

- Utilize multiple machine learning algorithms to create predictive models for bonus allocation.
- Ensure the model achieves at least 95% accuracy.

### **12. Model Evaluation**

- Evaluate models based on accuracy and performance metrics.

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## **Documentation and Deployment**

### **13. Document Findings and Processes**

- Prepare SQL documentation and complete the four business moments: measures of central tendency, dispersion, skewness, and kurtosis.
- Write an EDA report detailing the analysis performed and how it relates to the business problem.

### **14. Deploy Model**

- Use Streamlit (or similar tool) to deploy the machine learning model for real-time bonus allocation.

### **15. Prepare Presentation**

- Create a PowerPoint presentation summarizing the project workflow, findings, and model deployment.

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## **Final Steps**

### **16. Submit All Project Documents**

- Ensure all documents (project charter, CRISP MLQ, dataset, EDA report, etc.) are submitted by the deadline.

### **17. Mock Presentation**

- Prepare for a mock session to present the project, highlighting key findings and the importance of optimized bonus allocation.

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## **Ongoing Tasks**

### **18. Daily Review**

- Read and review mind maps or relevant materials daily to stay updated and reinforce learning.