Members

Jo-Anne van der Wath (577394)

Henry Roux (577440)

Armandre Erasmus (577311)

Chaleigh Storm (577716)

Bin381

Project Milestone 6

Table of Contents

[Deployment Plan 2](#_Toc181110053)

[Monitoring and Maintenance Plan 2](#_Toc181110054)

[Reviewing the Project 2](#_Toc181110055)

# Deployment Plan

## Review of Data Mining Results

The Random Forest model was finalized in Milestone 4 based on its strong performance across accuracy, recall, and F1 score, aligning with business goals. The model successfully predicts customer eligibility using demographic and financial data (annual salary, occupation, education level, etc.).

The model effectively addresses the business problem by incorporating additional predictive features beyond income, improving the accuracy of eligibility predictions and potentially expanding the eligible customer base without increasing credit risk.

## Best Approach for Implementation

Shiny Application: Deploying the model through a Shiny web application ensures interactivity, accessibility, and ease of use for business users. Shiny is particularly effective because it allows direct integration with R and can dynamically display predictions and insights.

Alternative Cloud Hosting Options: For scalability, consider hosting the Shiny app on a cloud platform (e.g., Shinyapps.io or an internal server) to manage secure access and potentially large data volumes.

## Deployment Strategy

### Deployable Results

Primary Output: The model provides a classification score (eligible/ineligible) for each customer.

Feature Importance Insights: The model outputs the most influential features, which can inform future business decisions by identifying key eligibility factors.

Dashboard for Data Exploration: The Shiny app will display real-time predictions and graphical representations of trends (e.g., eligibility distribution, predictor impact).

### Alternative Deployment Plans

Flask + Docker: If Shiny’s deployment limitations are encountered, Flask (Python-based) with Docker for containerization can serve as an alternative. Flask is lightweight and can easily integrate machine learning models, though it may require converting the R model into Python.

Power BI Integration: For broader visualization options, Power BI could be used as a supplemental tool to display the model’s outputs. Power BI can provide additional analytical insights but doesn’t natively support model hosting.

### Information Distribution to Users

Shiny Dashboard: Users will access a dashboard where they can enter new customer data, view eligibility scores, and analyze key predictor trends.

Automated Reports: Weekly summary reports will be generated and shared with stakeholders, outlining model performance, new eligible customers, and trends in predictor values.

User Guides and Training: Onboarding and training materials will help end-users interpret results accurately, emphasizing predictor importance and potential use cases.

### Monitoring the Model’s Use and Measuring Effectiveness

User Activity Tracking: Integrate usage tracking (e.g., Google Analytics for Shiny) to monitor user interactions, such as login frequency and session duration, to understand how the model is being used.

Performance Metrics: Monitor key model metrics like accuracy, precision, recall, and F1 score monthly, with data aggregated into monthly performance summaries for stakeholders.

Feedback Mechanism: Allow users to submit feedback directly through the Shiny interface, which can help identify usability issues or areas needing clarification.

### Integration with Organizational Systems

Data Integration: Set up regular data feeds from CustData2.csv or a similar database, automating weekly data updates. Implement data validation steps to ensure input data is formatted correctly for the model.

User Access and Permissions: Configure access controls to restrict usage of the Shiny app to authorized users. Store predictions and usage logs securely within the organization’s data infrastructure.

Data mining and machine learning deployments tools

Deployment tools recommendation

Deployment

# Monitoring and Maintenance Plan

Considerations

Monitoring and maintenance strategy

# Reviewing the Project