

Customer Churn Analysis Project Charter

Project Title: Customer Churn Analysis for Telecommunication Company

Project Sponsor: Doris Lee, CEO of Advanced Consultant Services

Project Manager: Maniram Luitel

Project Start Date: July 1, 2024

Expected Project End Date: September 21, 2024

Introduction

A significant customer churn rate had been prominent factor affecting the telecommunication industry. Despite advance development in the digital technologies, the industry suffers the customer churn issue persistently. This project will investigate on customers data from a telecommunication company to better understand the reason contributing to the loss of customers and find effective strategies for their retention. Additionally, this project will use customer details like gender, age factor and their behaviour towards the telecommunication services. Customer behaviour like contract length they stay in, services they subscribe and monthly charges they pay are important attributes to investigate the customer churn rate.

Goals and Objective

The main goal of this project is to improve the customer retention in the telecommunication industry by 20% investigating the customer data to understand the churn factors and address them.

The primary objectives of the project are to:

1. **Churn factor analysis** - identify the key customer churn factors using different statistical techniques and utilizing various machine learning algorithms within next two months.
2. **Model development**- develop and validate optimal performing predictive models to forecast customer churn within one month after churn factor analysis.
3. **Insight generation and visualization** - generate actionable insights and visualizations based on the analysis to understand churn patterns and trends within next three months.
4. **Recommendation development** - develop a comprehensive recommendation report outlining strategies to mitigate churn and enhance customer retention within two weeks after model development.

Scope

The scope of customer churn analysis is:

In-Scope

- **Dataset Pre-processing and analysing:** Preprocessing and analysing the dataset using Python tools and technologies.
- **Computational Resources:** Utilizing computational resources such as regression, neural networks, classification algorithms, clustering, Scikit-Learn, Matplotlib, and NumPy.
- **Recommendation Development:** Developing a recommendation report based on insights from the analysis.

Out-Scope

- **Customer Interaction:** Direct interaction with customers for additional data collection or feedback.
- **Implementation of Retention Strategies:** Implementation of the developed retention strategies.
- **Infrastructure Changes:** The project is confined to analysing the customer churn data and does not extend to making any changes in the technological setup of the telecommunications company.

Project Deliverables

There are two major deliverables namely data preparation and modelling and predicting customer churn and reporting. The detail of each deliverable is listed below:

1. Data Preparation and Modelling

This deliverable can be broken down into three sub-deliverables and they are:

- 1) **Pre-processed Dataset:** This will involve cleaning and preparing the dataset for analysis, handling missing data, encoding categorical variables, and normalizing the data.
- 2) **Training and Testing Datasets:** This will involve segregating the data into balanced training and testing sets, ready for model training and evaluation.
- 3) **Clustering Analysis:** This will involve identifying optimal clusters using the elbow method, training the K-Means clustering model, and visualizing and labelling the clusters.

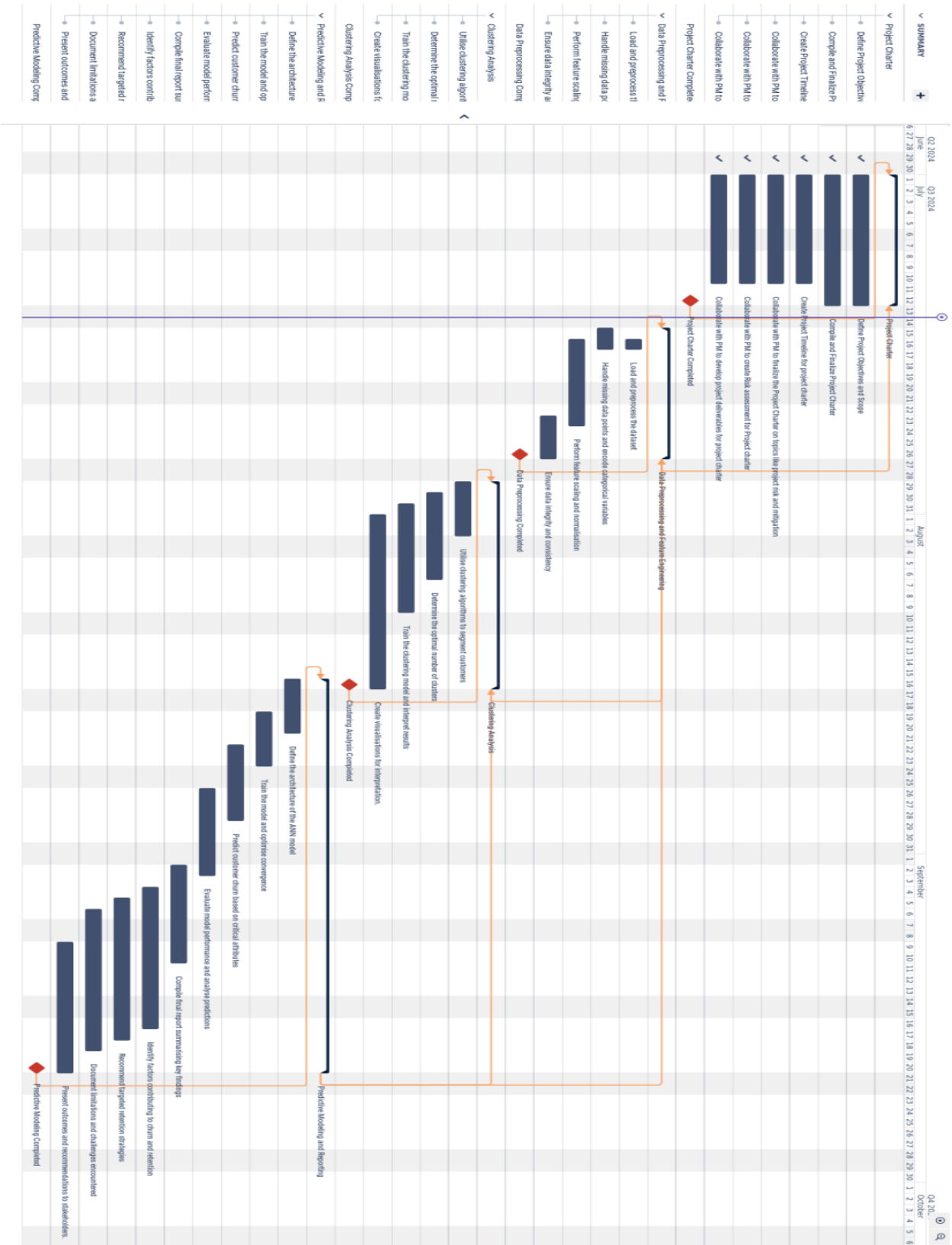
2. Predicting Customer Churn and Reporting

This deliverable can be broken down into four sub-deliverables and they are:

- 1) **Predictive Model:** This will involve defining the architecture of the ANN model, training it on the processed dataset, and evaluating its performance.
- 2) **Visualizations and Charts:** This will involve creating graphical representations to support data analysis and findings.
- 3) **Final Report:** This will involve summarizing key findings, analysing factors contributing to churn, documenting limitations, and providing recommendations for customer retention.
- 4) **Video Demonstration:** This will be a 10–15-minute video summarizing the project's development, model evaluation, and key findings.

Project Timeline

Customer Churn Analysis for Telecommunication Company starts on 1st July 2024, and it will end on 20th September 2024. The project can be viewed into four major timeframes. First is the project charter commencing from 1st July and ends on 12th July when the planning of the project is documented. Secondly, data pre-processing and feature engineering of the provided customer data takes from 15th July to 26th July. Similarly, clustering analysis of the processed dataset is set between 29th July to 16th August. Lastly, predictive modelling and reporting is the final phase of the project which is set between 16th August to 20th September. The breakdown of the tasks that will be carried out on each phase and their estimated time of completion is shown by the chart below:



(Please adjust your view to read this chart)

The above chart shows dependencies only between the project stages, and dependencies of milestones. These dependencies are outlined below:

Inter-stage Dependencies

- 1) Project Charter: Depends on the completion of all tasks within the "Project Charter" stage.
- 2) Data Pre-processing and Feature Engineering: Depends on the completion of the "Project Charter" stage.
- 3) Clustering Analysis Completion: Depends on the completion of the "Data Pre-processing and Feature Engineering" stage.
- 4) Predictive Modelling and Reporting Completion: Depends on the completion of the "Clustering Analysis" stage and "Data Pre-processing and Feature Engineering" stage.

Milestones dependencies

- 1) Project Charter Completion: Depends on the completion of the "Project Charter" stage.
- 2) Data Pre-processing Completion: Depends on the completion of the "Data Pre-processing and Feature Engineering" stage.
- 3) Clustering Analysis: Depends on the completion of the "Clustering Analysis" stage.
- 4) Predictive Modelling and Reporting: Depends on the completion of the "Predictive Modelling and Reporting" stage.

Milestones

The following are the milestones of this project:

- 1) **July 12, 2024:** Completion of Project Planning and Setup.
- 2) **July 26, 2024:** Completion of Data Preparation and feature engineering.
- 3) **August 16, 2024:** Completion of Clustering analysis.
- 4) **September 20, 2024:** Completion of Predicting Customer Churn and Reporting

Roles and Responsibilities

There are five distinct roles in this project. The roles and its owners are shown in the following table.

Team Member	Primary Roles	Secondary Role
Maniram Luitel	Project Manager	Data Analyst Predictive Modelling
Daichi Tsukahara	Business Analyst	Data Analyst Clustering Analysis
Kushal Basyal	Data Analyst Clustering Analysis	Data Engineer
Bhavesh Rupchand Chaudhary	Data Engineer	Project Manager
Mujtaba Ali Khan	Data Analyst Predictive Modelling	Business Analyst

The following table outlines the associated responsibilities for each role listed above.

Role	Responsibilities
Project Manager	<ul style="list-style-type: none"> • Oversee project tasks, timelines, and deliverables. • Facilitate communication among team members. • Manage and allocate resources effectively. • Ensure quality standards and manage risks. • Lead team meetings and document discussions. • Communicate progress and updates to stakeholders. • Compile and review project deliverables.
Data Engineer	<ul style="list-style-type: none"> • Load and preprocess the dataset. • Handle missing data and encode categorical variables. • Perform feature scaling and normalization. • Ensure data integrity and consistency. • Collaborate with team members on data preparation.
Data Analyst - Clustering Analysis	<ul style="list-style-type: none"> • Segment customers using clustering algorithms. • Determine the optimal number of clusters. • Train and visualize clustering models. • Communicate findings to the team.

Data Analyst - Predictive Modelling	<ul style="list-style-type: none"> • Define the architecture of the ANN model • Predict customer churn and evaluate model performance. • Document the Modelling process and results. • Use the trained model to predict customer churn based on critical attributes and behaviours. • Evaluate the model's predictive performance and analyse the accuracy of churn predictions. • Document and communicate findings to other team members and stakeholders.
Business Analyst	<ul style="list-style-type: none"> • Identify key factors contributing to customer churn. • Develop actionable retention strategies. • Compile the final report with findings and recommendations. • Create visualizations to support analysis. • Present the project outcomes to stakeholders clearly and concisely, highlighting actionable insights and recommendations.

Risk Assessment

Following is some of the potential risks associated in this project and their mitigation strategies:

1. Data Quality and Integrity

Risk: Customer Data might be partial or incorrect which could lead to poor analytical outcome.

Mitigation: Data validation and data preprocessing will be carried out extensively to ensure accuracy of the used datasets.

2. Bias in Data or Models

Risk: If customer data used to build churn prediction model or modelling process gets biased, it may lead to inaccuracy of the models.

Mitigation: Regular model performance checks to discover and amend biases, with the right key evaluation metrics.

3. Choosing the Right Algorithms

Risk: Clustering and Predictive Modelling Results may not be accurate - This can happen if the selected algorithms are wrong.

Mitigation: A variety of machine learning algorithms might be used to determine which work and do not for our dataset.

4. Finding the Optimal Number of Clusters

Risk: Models could underperform because of things like overfitting or underfitting

Mitigation: Model robustness will be improved, and operations such as preventing overfitting by using tools like cross-validation regularization.

5. Accuracy of Predictive Models

Risk: Predictive models could perform badly from issues such as overfitting or small amounts of training data.

Mitigation: Model response will be greater, and chances of overfitting reduced by employing cross validation and regularization techniques.

6. Misinterpreting the Results

Risk: It is difficult to determine if confusion or methodological error, and these may ultimately bias the conclusions towards interpretation of the analysis.

Mitigation: Procedures and effects will be fully documented with justification. Also, the correct interpretation methods will be taught to various stakeholders.

7. Making Findings Actionable

Risk: Analysis-derived insights do not translate into practical work.

Mitigation - Progress of projects will be tracked, and results will then visualize in a manner that helps take actionable decisions.

8. Availability of Skilled Personnel

Risk: Limited access to skilled team members could delay the project

Mitigation: Use scrum methodology in which all stakeholders are involved together for ensuring the flexibility and efficiency of working.

9. Adhering to the Time Frame of Project

Risk: Technical delays, resource limitations or a scope change may lead to the delay.

Mitigation: Change management will be incorporated following agile project method to adhere the agreed timeline.

The above identified risks are assessed using a matrix where likelihood of their occurrence and severity on the project are categorised as low, medium and high. The table below shows the classification of the identified risk based on the assessment matrix:

SEVERITY			
	Low	Medium	High
LIKELIHOOD			
Low		8	1,3,4, 7
Medium		2	5, 6
High		9	

Approval:
Project Sponsor: Doris Lee
Date: July 1, 2024