Teleco Churn Analyzer Using Power Bi

Major Project Report

Submitted in partial fulfillment of the requirements for the degree of

Bachelor of Engineering (Computer Engineering)

by:

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Under the Guidance of

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TERNA ENGINEERING COLLEGE

Nerul (W), Navi Mumbai 400706

(University of Mumbai)

(2022-2023)

TERNA ENGINEERING COLLEGE, NERUL, NAVI MUMBAI

Department of Computer Engineering

Academic Year 2022-23

CERTIFICATE

This is to certify that the major project entitles **"Teleco Churn Analyzer Using Power BI"** is a bonafide work of

Sahil Sanjiv Bhosale	**TU3F1920044**
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submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the Bachelor of Engineering (Computer Engineering).

Guide **Head of Department** **Principal**

Approval Sheet

Project Report Approval

This Major Project Report – an entitled "**Teleco Churn Analyzer Using Power BI**" by following students is approved for the degree of ***B.E. in "Computer Engineering"***.

Submitted by:

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Examiners Name & Signature:

1.----------

2.----------

Date: ----------

Place: ----------

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Acknowledgement

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We take the privilege to express our sincere thanks **to Dr. L. K. Ragha** our Principal for providing the encouragement and much support throughout our work.

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Abstract

Churners have always been a big issue for any service providing company. Churning increases cost of the company as well as decreases the rate of profit. The aim of our project is to analysis the customers past service usage, service performance, spending and other behaviour patterns, the likelihood of whether a customer wants to terminate service can be determined and predict whether a customer will churn in the near future or not based on the predictive analysis using billing data of a telecom company. And we will be doing a complete EDA process to determine if the customer from that particular telecom industry will leave that telecom service or not meanwhile, we will draw some insights from data visualization and analysis in PowerBi.

List of Figures

Chapter 1

Introduction

1.1: Introduction

Churn analysis is probably one of the most important tasks for telecom companies. In our project we are going to analyze the telecom customer churn which plays a major factor in the overall profits earned by the company.

We will also predict the customers that are at a high risk of leaving. The overall project we are making in Power BI which is very useful business analytics tool.

1.2: Scope

- Use of complete dataset to implement churn analysis method.
- Properly use data modelling tool to predict the churning.
- Implement multiple methods to analyze churn.
- Compare different methods to find the optimal one.
- Use and compare multiple data visualization techniques.
- Use of different dashboards for different by selected parameters

1.3: Organization of the Report

Chapter 1 contains brief introduction and scope of the project.

Chapter 2 contains Literature Survey. In this chapter, we have studied and reviewed the previous work done on the topics related to our project. We have included different papers published by their respective authors. Also, we have mentioned the Problem Statement and Objective of the project.

Chapter 3 Methodology deals with the Software Model and its phases, the proposed system, SRS, Hardware and Software Requirements and Gantt Chart.

Chapter 4 includes design of the project with DFD, Use Case, Flowchart, Sequence and Data Model Diagrams.

Chapter 5 includes implementation and result of the project.

Chapter 6 contains conclusion of the project.

Lastly, it has list of references.

Chapter 2

Literature Survey

Year	Author Name	Paper Name	Description
2021	B.N.Krishna Sai	Predictive Analysis and Modeling of Customer Churn in Telecom using Machine Learning Technique	In this paper , author used random forest algorithm and got 82% accuracy for churn analysis.
2020	Pushkar Bhuse	Machine Learning Based Telecom-Customer Churn Prediction	In this paper , author used decision tree algorithm and got 80% accuracy in churn prediction.
2019	Kamil Dimililer	Customer Churn Prediction For Business Intelligence	In this paper , author proposed the model using logistic regression with accuracy of 78% which was able to predict churn and the trends .

2.1: Limitations of Existing system

- Time consumption:

  Data analysis using paperwork consumes a lot of time.

- Storage requirements:

  The amount of storage space needs increase as files and registers are used.

- Less reliable:

  Paper analysis are not at all reliable when used to store important data.

- Difficulty in keeping new records:

  Maintaining fresh records is challenging because there are many records of customers.

2.2: Problem Statement

The retention and acquisition of users are the major concerns in telecom industry. The fast growth of marketplace in every business is giving rise to increased subscriber base. It has become necessary for service-providers to reduce the churn rate of customers since the inattention might negatively influence profitability of the company.

In current system, churn prediction contributes to identify those users who are likely to switch a company over another. Telecom is enduring the problem of ever-increasing churn rate. Machine learning algorithm techniques facilitate these telecom firms to be protected with efficient approaches for lessening the rate of churn. It must be the aim of the decision-maker and systems lessen the churn ratio since it is a recognized fact that comparatively existing customers are the most beneficial resources for companies than acquiring new one.

2.3: Objectives

- To explore the customer churn prediction in telecom using machine learning in big data platform.
- To investigate the impact of customer churn in telecom industry as a whole.
- To discuss the significance of different tools models for customer churn in telecom industry.
- To reduce time complexity for better decisions to bring back customers which are at high risk of loosing services of company.
- To develop simple understandable dashboards by the data visualization techniques of different software tools like Power Bi.

Chapter 3

Methodology

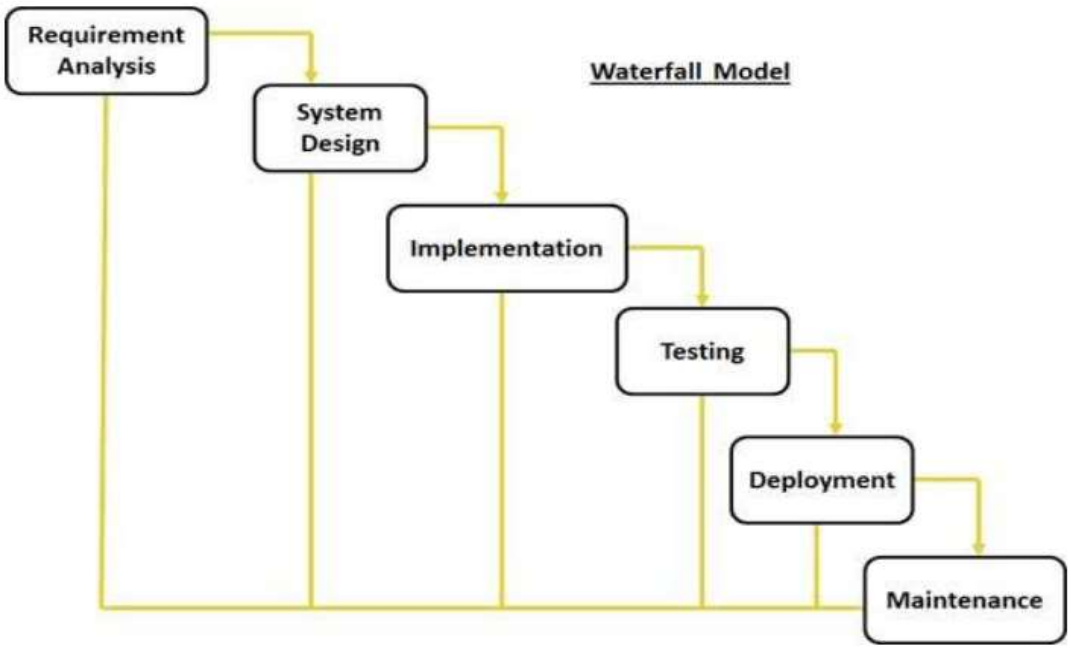
3.1: Software Model

The Waterfall model is the SDLC approach that is used for the project development. The waterfall Model illustrates the software development process in a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete.

The sequential phases in **Waterfall model** are −

- **Requirement Gathering and analysis** − All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.
- **System Design** − The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.
- **Implementation** − With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.
- **Integration and Testing** − All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
- **Deployment of system** − Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.
- **Maintenance** − There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

3.1.1: Phases of Software Model



The reasons for using waterfall development is that Waterfall methodology prevails when the project is constrained by cost and/or time, and the requirements and scope are well understood. In these cases, the Waterfall methodology provides a set of processes that are built on the principle of approval of the previous phase

3.2: Proposed System

- In Proposed System is being made in Power BI tool which is offers the interactive data visualization and analytics tool for business intelligence (BI).
- The analysis of data is divided into various dashboards so clients can easily understand the situation of the business.
- In this system, we are predicting the customers that are at a high risk of leaving.
- In proposed system the aim is to increase the revenue of the company and helps in taking appropriate decision by analyzing the business problems.

3.3: System Requirement Specification(SRS)

3.3.1: Functional Requirements

Home module:

- 1st dashboard is home page which includes all the button to the 4 dashboards.
- The system will allow the user to view all the dashboards from this module.

Summary module:

- The system will allow the user to view the monthly, weekly reports of customer usage.
- The system will allow the user to view monthly charges, total charges of churner profile.
- The system will allow the user to view monthly charges ,total charges of customer profile.
- The overall analysis of the churn can view in this module.

Customer Details module:

- The system will allow the users to view customer details of the company.
- After opening dashboard user can view customer personal details,customer is risky or not.
- User just have to select the customer Id , after selecting customer id all details will be displayed.

Churn Reasons:

- The system will view the churn factors in this dashboard.
- The system will view no.of risky customers,average risk,and the graphical representation of churn factors.
- The system will view the total numbers of customers in this dashboard.

Ask Question Module module:

- In this dashboard system will view the default questions generated by the system .
- The system will provide the in built functions of PowerBI to provide such suggestions via questions.
- The system will allow to modify this questions and add new questions.

3.3.2: Non-Functional Requirements

A non-functional requirement (NFR) is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviours .The overall qualities of the system such as usability, maintainability, modifiability, portability, reusability, and security.

Maintainability:

The system should be well maintained and whenever there is need of changes system should be capable to accept that changes and modification by authorized user.

Reliability:

The system should work consistently and performs the desired task without failure in specified time.

Availability:

The system should always be available for access with power source.

Portability:

The system should run in every Windows, Mac and Linux operating system. The system should run on every version of web browsers. The system should run in every server and client computer.

Usability:

The system provides a help and support menu in all interfaces for the user to interact with the system.

3.4: Hardware and Software Requirements

- Frontend: PowerBI
- Backend: Python

The reason to use PowerBi is that it is a free-to-use, open-source software that provides effective functions which can be use in analytics and visualization.

Hardware requirements (with respect to user)

Processor: Intel Core I5 10 th Generation System

Processor Speed: 833 MHz

RAM: 4 GB RAM or more.

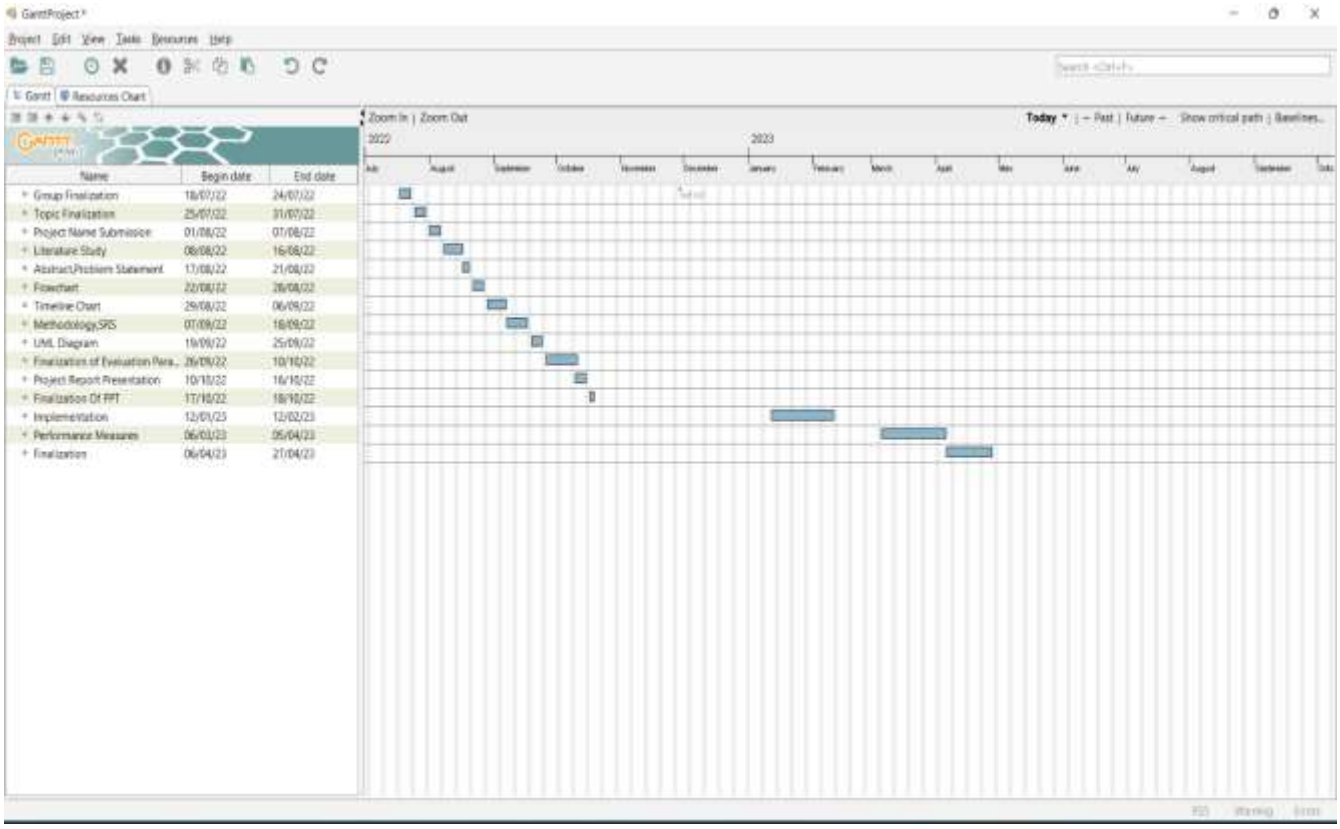
Software requirements (with respect to user)

Operating System: Windows 7,8,10

Environment: Visual Studio Code

Language: Python

3.5: Gantt Chart (Timeline Chart)



Chapter 4

Design

4.1: Data Flow Diagram

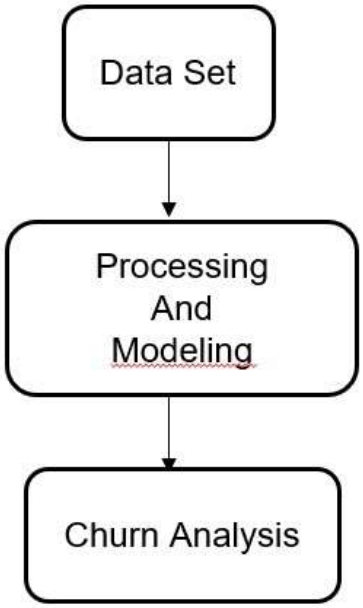


Figure 4.1.1: Level 0 Data Flow Diagram

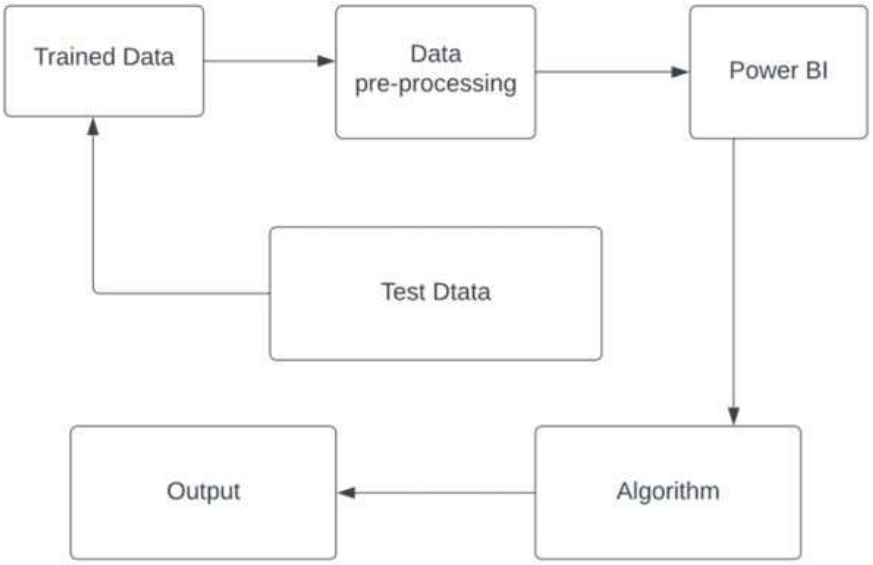


Figure 4.1.2: Level 1 Data Flow Diagram

4.2: Use case Diagram

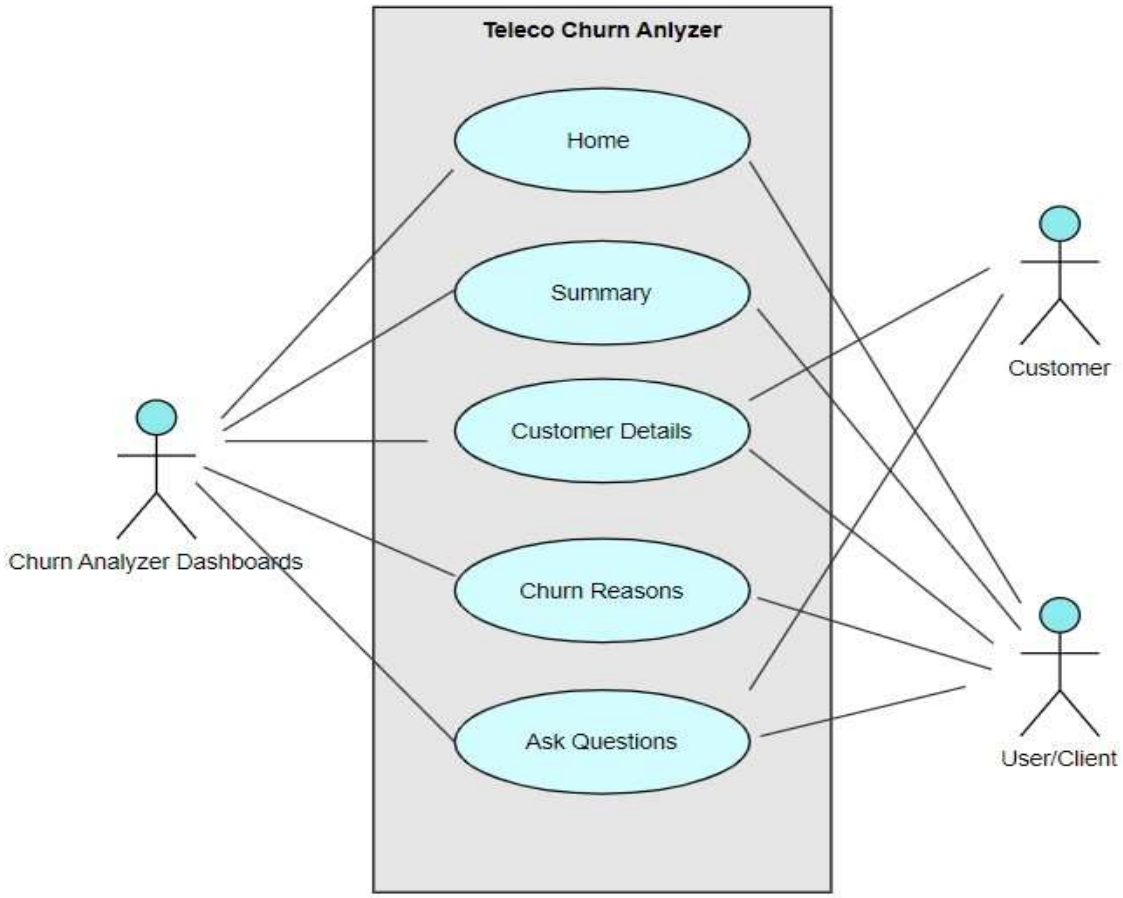


Figure 4.2: Use case diagram

4.3: Flowchart Diagram

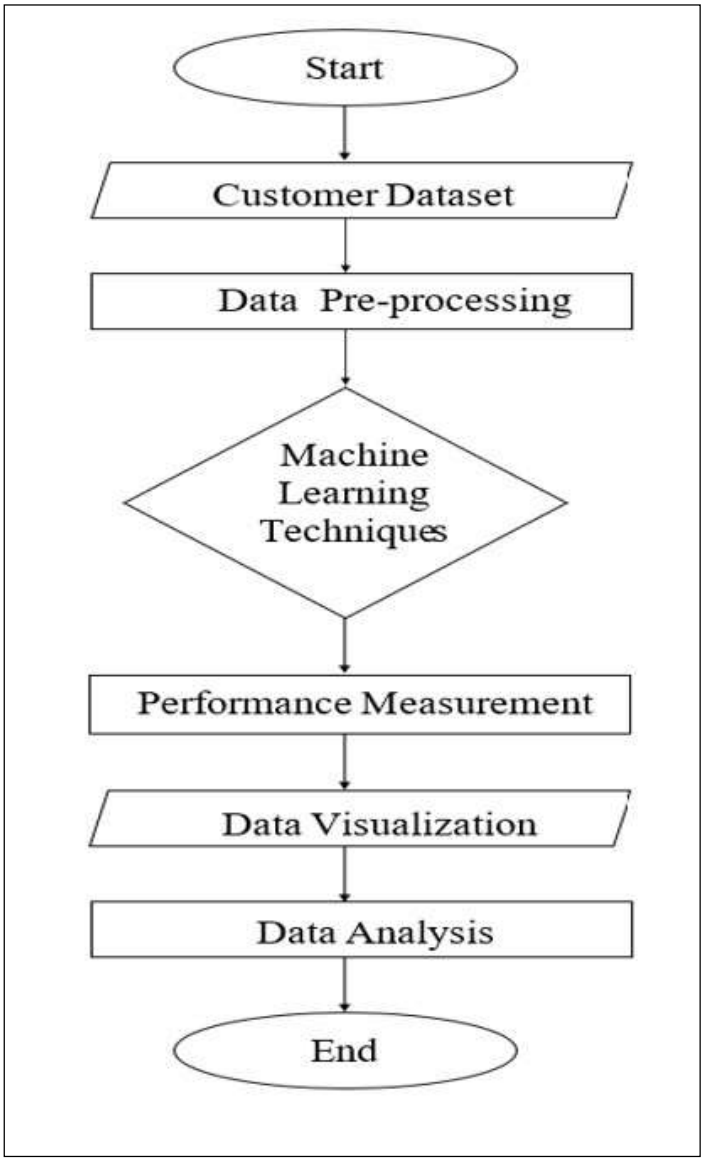


Figure 4.3: Flowchart Diagram

4.4: Sequence Diagram

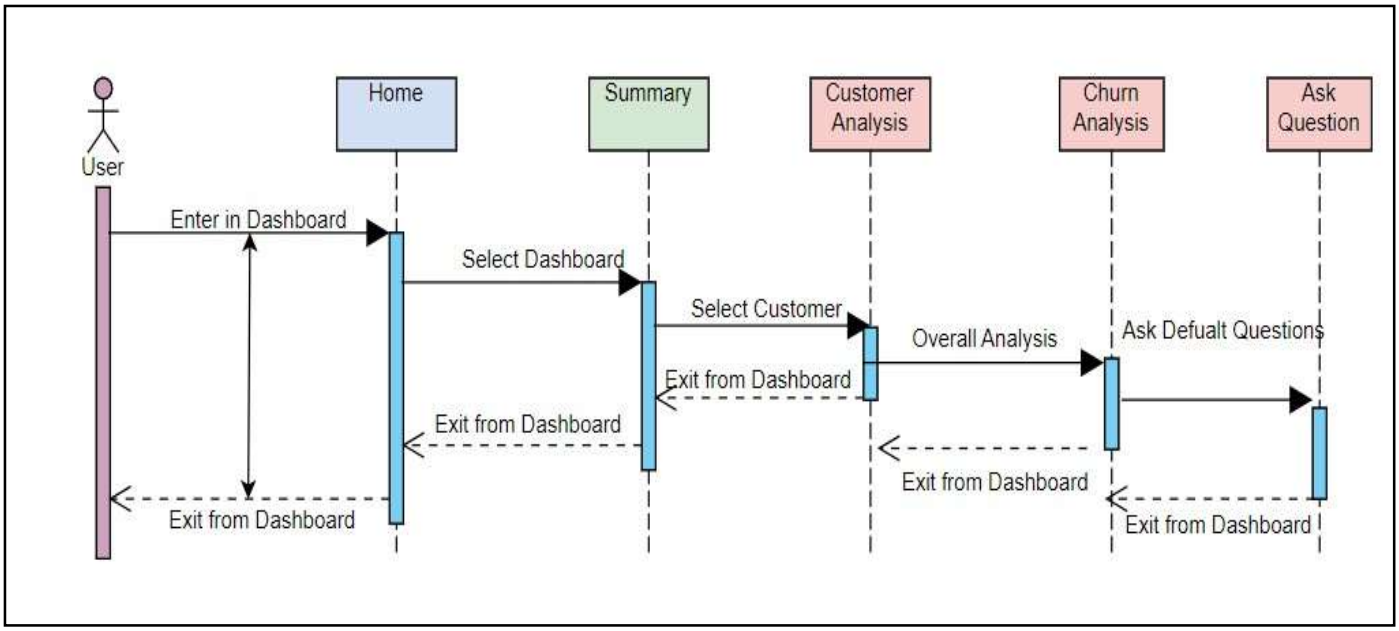


Figure 4.4: Sequence diagram

Chapter 5

Conclusion

The project is ready with the all system designs and all user requirements have been addressed, and it will be made as user-friendly as possible. And the system is ready for implementation phase.

The **Goal** of the project is working on the telecom churn analysis and here we will be doing a complete EDA process to determine if the customer from that particular telecom industry will leave that telecom service or not meanwhile, we will draw some insights from data visualization and analysis in PowerBi so that we could get the factors which will affect the output i.e. churn of the customer.

References

[1] B.N.Krishna - Predictive Analysis and Modeling of Customer Churn in Telecom using Machine

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[3] Kamil Dimililer - Customer Churn Prediction For Business Intelligence April 2021