Project Charter

ExxonMobil Stock Prediction Project

Table of Contents

Section 1. Charter Introduction

1.1 Document Change Control

Revision Number	Date of Issue	Author(s)	Brief Description of Change
1.0	25-Jan-2025	Bill Buckley	Initial Project Charter

1.2 Executive Summary

The **ExxonMobil Stock Prediction Project** is designed to analyze and forecast ExxonMobil's stock price movements by leveraging historical stock data, crude oil prices, and interest rates. ExxonMobil, as one of the largest oil and gas companies globally, is highly sensitive to fluctuations in oil prices and macroeconomic factors such as interest rates. Given these influences, investors and analysts require a data-driven approach to anticipate stock price trends and make informed financial decisions.

This project was initiated to support investors, financial analysts, and market researchers in better understanding ExxonMobil's stock behavior. By integrating financial market data and economic indicators, this project aims to develop a predictive model that provides insights into short-term price movements. The final deliverable—a data-driven forecasting model—will enable stakeholders to assess market risks and investment opportunities more effectively.

1.2.1 Key Aspects of the Project:

- **Project Goals & Objectives**: Develop a predictive model leveraging historical stock data, oil prices, and interest rates to forecast ExxonMobil's stock trends.
- **Major Milestones**: Data collection, preprocessing, model development, evaluation, and final reporting.
- **Key Deliverables**: A functional stock price prediction model and an analytical report summarizing key findings.
- **Key Risks**: Market volatility, data accuracy issues, and model performance limitations.

This project aligns with the growing need for data-driven decision-making in financial markets, helping investors and analysts navigate stock price fluctuations with greater confidence.

1.3 Authorization

This project charter formally authorizes the existence of the project, ExxonMobil Stock Prediction Project, and provides the project manager with the authority to apply organizational resources to project activities described herein. If there is a change in the project scope, the project charter will be updated and submitted for re-approval.

George Campanis_____ _____
Full name Date
Project Sponsor

Bill Buckley_____
Full name Date
Project Manager

Section 2. Project Overview

2.1 Project Summary

The **ExxonMobil Stock Prediction Project** focuses on developing a robust forecasting model to predict the stock price movements of ExxonMobil**,** incorporating key factors such as historical stock data, crude oil prices, and interest rates. This project aims to create a reliable tool for anticipating price trends and offering valuable insights into market behaviour.

The initiative was started to address the need for data-driven investment strategies in a volatile market. This project provides stakeholders with a clear methodology for understanding potential stock price changes and will enable investors, analysts, and market professionals to identify price movement patterns, assess market risks, and evaluate investment opportunities with greater accuracy.

2.1.1 Key Stakeholders & Beneficiaries:

- **Investors and Financial Analysts**: Will benefit from actionable insights that help in making better **buy/sell decisions** regarding ExxonMobil stock.
- **Market Researchers**: Will gain a structured perspective on how global oil prices and interest rates influence the energy sector, particularly ExxonMobil.
- **Portfolio Managers and Risk Analysts**: Can use the predictive model to optimize portfolio performance and reduce exposure to energy sector volatility.

2.1.2 Project Goals, Business Outcomes and Objectives

No.	Goals	Objectives	Business Outcomes
1	*Develop a predictive model for ExxonMobil stock price forecasting*	• *Build a forecasting model using historical stock data, oil prices, and interest rates*	• *A fully functional predictive model capable of forecasting ExxonMobil stock price trends with measurable accuracy.*
2	*Improve decision-making for investors and financial analysts*	• *Provide actionable insights by analyzing key economic indicators, e.g. oil prices, interest rates.*	• *Enhanced decision-making capabilities for investors, leading to more informed buy/sell decisions and better risk management in energy sector investments.*
3	*Identify market trends and price fluctuations for ExxonMobil stock*	• *Perform data analysis on the historical stock data and external market factors to identify price patterns*	• *Clear identification of key market trends affecting ExxonMobil's stock price, contributing to strategic investment decisions and market risk assessments.*

2.1.3 Project Scope

2.1.4 Scope Definition

The ExxonMobil Stock Prediction Model will deliver a functional model to predict stock price movements using historical data, oil prices, and interest rates, along with an analytical report summarizing key trends. The model's performance will be evaluated and optimized, and user documentation will provide clear instructions on how to use and interpret the model.

2.1.5 Boundaries

Activities In Scope	Activities Out of Scope
1. Collecting historical stock data for ExxonMobil, crude oil prices, and interest rates from publicly available APIs (Yahoo Finance, Alpha Vantage, FRED).	1. Using proprietary or subscription-based data sources.
2. Cleaning and preprocessing the data, including handling missing values and calculating relevant technical indicators	2. Making long-term stock predictions.
3. Developing a predictive model using regression or classification techniques to forecast ExxonMobil's stock price movements based on collected data.	3. Forecasting stock prices for other companies.
4. Evaluating and optimizing the model for accuracy and performing testing with real-world data.	
5. Delivering an analytical report with insights into stock price trends and the model's performance.	

2.2 Milestones

Project Milestone	Description	Expected Date
1. Develop a Project Charter	Develop a proposal and project plan that will be used to solidify and reinforce your understanding of the applied data analytics workflow process	24-Jan-2025
2. Create Case Study Documentation	Create a Data Flow Diagram, ERD, and Data Dictionary	8-Feb-2025
3. Create Data Definition Language Script	Create a single sql script that will create the database for the project in MS SQL Server.	14-Feb-2025
4. Develop ML Algorithm	Build a Predictive Model using R/Python (Regression/Classification).	1-Mar-2025
5. Download SSIS Data	Build an SSIS Package that downloads and imports the cases data.	1-Mar-2025
6. Integration of SSIS and Predictive Model Creation	Build a Package that automates the creation of your Predictive Model.	8-Mar-2025
7. Automation of an ML Model	automate the building of a Predictive Model using R/Python (Regression/Classification).	22-Mar-2025

Project Milestone	Description	Expected Date
8. Build MS PowerBI	Setup an MS Power BI Server, and create reports related to the Project	28-Mar-2025
9. Business Case Documentation and Presentation	Finalize your documentation and present the final working solution	7-Apr-2025

2.3 Deliverables

Project Deliverable 1: Project Charter	
Stakeholder:	George Campanis
Description:	Proposal and project plan
Acceptance Criteria:	Clear goals, scope, and milestones
Due Date:	24-Jan-2025
Project Deliverable 2: Case Study Documentation	
Stakeholder:	George Campanis
Description:	Data Flow Diagram, ERD, and Data Dictionary
Acceptance Criteria:	Accurate and complete diagrams
Due Date:	8-Feb-2025
Project Deliverable 3: Data Definition Language Script	
Stakeholder:	George Campanis
Description:	SQL script to create project database in MS SQL Server
Acceptance Criteria:	SQL script successfully creates the database
Due Date:	14-Feb-2025
Project Deliverable 4: ML Algorithm	
Stakeholder:	George Campanis
Description:	Predictive model using R/Python (Regression/Classification)
Acceptance Criteria:	Model built with reasonable accuracy
Due Date:	1-Mar-2025
Project Deliverable 5: SSIS Data Download Package	
Stakeholder:	George Campanis
Description:	SSIS package to download and import data
Acceptance Criteria:	Package runs successfully and imports data
Due Date:	1-Mar-2025
Project Deliverable 6: Integration of SSIS and Predictive Model	
Stakeholder:	George Campanis

Description:	Integrate SSIS with predictive model for automated updates
Acceptance Criteria:	Seamless data flow and automatic model updates
Due Date:	8-Mar-2025
Project Deliverable 7: Automated ML Model	
Stakeholder:	George Campanis
Description:	Automation of predictive model building process
Acceptance Criteria:	Model automatically updates with new data
Due Date:	
Project Deliverable 8: MS Power BI Reports	
Stakeholder:	George Campanis
Description:	Setup Power BI and create reports
Acceptance Criteria:	Reports are clear, accurate, and reflect model results
Due Date:	28-Mar-2025
Project Deliverable 9: Business Case Documentation and Presentation	
Stakeholder:	George Campanis
Description:	Final report and presentation of project results.
Acceptance Criteria:	Final report completed and presented clearly.
Due Date:	7-Apr-2025

2.4 Project Risks, Assumptions, and Constraints

2.4.1 Risks

No.	Risk Description	Probability (H/M/L)	Impact (H/M/L)	Risk Management Plan	OPI
1	Data accuracy issues with historical stock data or external economic indicators.	M	H	Regular validation and cross-checking of data sources to ensure accuracy.	Project Manager

No.	Risk Description	Probability (H/M/L)	Impact (H/M/L)	Risk Management Plan	OPI
2	Model performance is lower than expected, with poor predictive accuracy.	M	H	Evaluate different models (linear regression vs classification) and optimize for better accuracy.	Project Manager
3	Delays in data collection or preprocessing (e.g., API limitations or data availability issues).	L	H	Plan for alternate data sources and ensure data collection is done in a timely manner.	Project Manager
4	Changes in macroeconomic factors (e.g., sudden shifts in oil prices or interest rates).	M	H	Keep monitoring macroeconomic trends and adjust the model as necessary to account for significant changes.	Project Manager
5	Technical issues or system failures with tools (SQL server, SSIS, or Power BI).	L	M	Conduct regular system checks and have contingency plans in case of technical failure.	Project Manager

2.4.2 Assumptions

The following table lists the items that cannot be proven or demonstrated when this project charter was prepared, but they are taken into account to stabilize the project approach or planning.

No.	Assumptions
1	The data from public APIs (Yahoo Finance, Alpha Vantage, FRED) will remain accessible and reliable throughout the project.
2	External economic factors, such as oil prices and interest rates, will follow observable trends that can be integrated into the predictive model.
3	The project manager will have access to necessary computational resources and software tools (e.g., R/Python, MS SQL Server, Power BI) for data analysis and model development.

2.4.3 Constraints

The following table lists the conditional factors within which the project must operate or fit.

No.	Category	Constraints
1	Time	The project should be completed by the specified due dates for each milestone, with final delivery by 7-Apr-2025.
2	Data Availability	The project is limited to using publicly available data sources (Yahoo Finance, Alpha Vantage, FRED), without access to paid or proprietary data.
3	Resources	The project must rely on available tools and computational resources (R/Python, MS SQL Server, Power BI) that are within the project manager's access and capability.

Project References

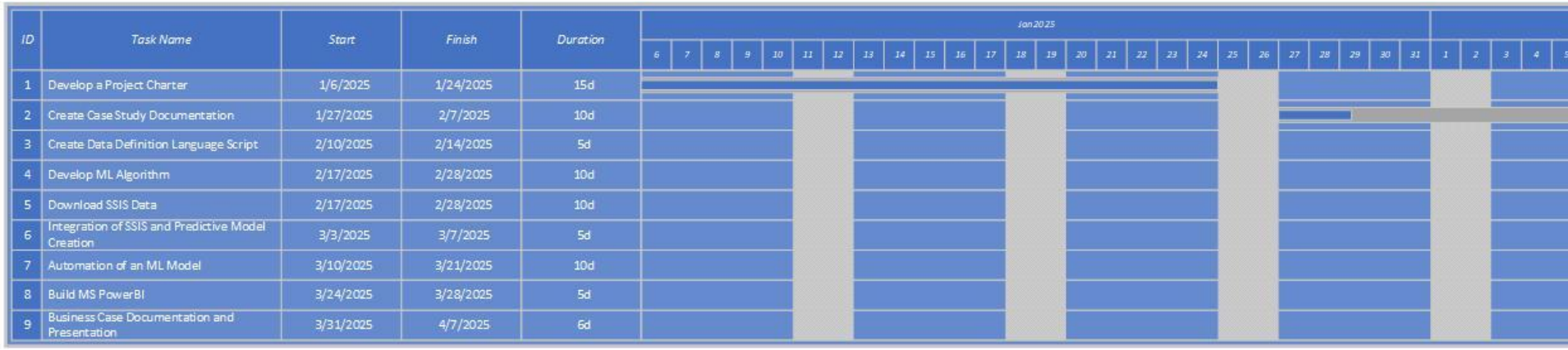
More information concerning this project can be found in the following documents:

Document Title	Version #	Date	Author and Organization	Location (link or path)
Project Charter	1D	25-Jan-2025	Project Manager	Y:\DBAS 3090\Assignment 1

Appendix

Appendix A: Project Schedule

ID	Task Name	Start	Finish	Duration
1	Develop a Project Charter	1/6/2025	1/24/2025	15d
2	Create Case Study Documentation	1/27/2025	2/7/2025	10d
3	Create Data Definition Language Script	2/10/2025	2/14/2025	5d
4	Develop ML Algorithm	2/17/2025	2/28/2025	10d
5	Download SSIS Data	2/17/2025	2/28/2025	10d
6	Integration of SSIS and Predictive Model Creation	3/3/2025	3/7/2025	5d
7	Automation of an ML Model	3/10/2025	3/21/2025	10d
8	Build MS PowerBI	3/24/2025	3/28/2025	5d
9	Business Case Documentation and Presentation	3/31/2025	4/7/2025	6d



Appendix B: Expected KPIs

No.	KPI	Description
1	Model Accuracy	Percentage of correct predictions compared to actual stock prices.
2	Data Processing Time	Time taken to collect, clean, and process data before model execution.
3	System Performance	Execution speed and resource efficiency of the predictive model.
4	Stakeholder Satisfaction	Feedback from users on model usability and insights provided.
5	Visualization Effectiveness	Clarity and usefulness of Power BI reports in presenting stock trends.