Process MeNtOR 3.0

Country Statistics Data Analysis & Visualization System

Requirements Model

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object oriented pty. ltd.

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1.1	Feb 03 2021	Rui Zhu	Added Introduction and overview
1.2	Feb 04 2021	Zheng Yang	Added Use Case Descriptions
1.3	Feb 04 2021	Yiran Shao, Rui Zhu	Added Actor Diagram, Domain Model
1.4	Feb 06 2021	Zheng Yang	Added Use Case Diagrams
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1.6	Feb 07 2021	Yiran Shao; Junyi Yang; Zheng Yang; Rui Zhu	SRS Document Evaluation Part 1
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Document Sign-Off

Name (Position)	Initials	Date
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Contents

1 Introduction

1.1 Purpose

This document details the requirements of a prototyping model that allows for users to retrieve, process and render data for visualization and analysis of one selected country from the *World Bank's data repository*. It examines details and scenaria pertaining to the existing system as well those relevant to the functional extension, and presents models at the business scenario, domain, and interaction levels. It also addresses the non-functional requirements of the system, and the distribution of activities towards system development.

1.2 Overview

The aim of the project is to implement a prototype system which allows users to:

1. Retrieving demographics and other data of a country by selecting its name and year of data interested related to Environment and to Health from the *World Bank's data repository*.
2. Once the data is collected, they may choose to process the data with different types of analyses needed on the data collected. Such as the ratio of different variables, and then display the date on a User Interface system.
3. By computing and rendering the retrieved data or the processed data using selected parameters, the users can choose visualization methods such as bar charts, line graphs, scattered plots, and pie charts to demonstrate the data. Initially there are multiple plotting methods available. However, it should allow adding/removing one/multiple types of graphs/viewers to diverse the illustration of the analysis.

   The interface performs the selected parameters and the rendering data, with different parts of tuning parameters.

Non-functional requirements such as security and performance are also considerations within the context of platform deployment.

1.3 References

World Bank's API:
https://datahelpdesk.worldbank.org/knowledgebase/articles/898581

JavaAPI:
http://api.worldbank.org/v2/country/can/indicator/SP.POP.TOTL?date=2000:2001&format=json

Draw.io: *https://app.diagrams.net/*

UMLet:*https://www.umlet.com/*

2 Business Scenario Model

2.1 Actors

2.1.1 Overview

The actors in our system include client end users, managers, services and databases. As providing the correct combination of username and password, end users exist in an environment that allows interaction with the country statistics system to retrieve, process and render data. Managers have access to manage the resources (retrieved data, parameters etc). Database stores all user data, country data, views data. User service interacts with the World Bank's database every time when there's a request from the end client user.

2.1.2 Actor Diagram

The figure below represents the actors in our system. Based on their interaction with the system , the actors are characterized into four general groups: a) Users, b) Managers, c) Services and d) Databases.

As illustrated in the actor diagram, UI Managers and Data Managers inherit from Managers, manage the resources based on the request created by Client User from User Service. System databases and World Bank's databases inherit from databases where they store all the data required about login information, retrieved data, processed data and selected parameters for visualization and analysis of country data.

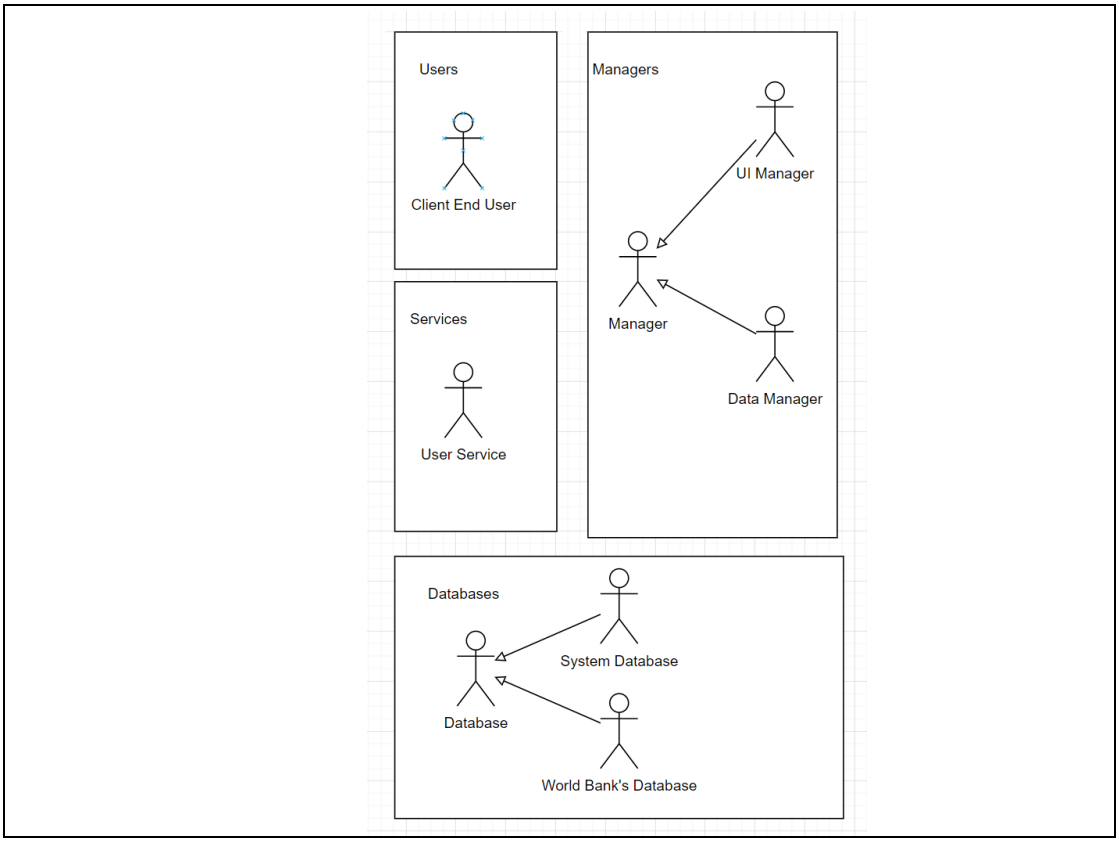

Fig. 2.1.2 Actor Diagram

2.1.3 Actor Definitions

Client End User

Description	The Country Statistics Client User is a human actor that interacts with the system through the “Country Statistics” software. Anyone who uses this software is considered a “Country Statistics Client User”. The roles of this actor in the context of the system include creating and login to a user
Aliases	Client User, End User, User
Inherits	None
Actor Type	Active - Person
Contact Person	None
Contact Details	None

World Bank’s Database

Description	The World Bank’s Database is an external agent that is invoked through the system. The data of this system will be retrieved from one or more data pools from the World Bank’s database remote issuing http GET requests.
Aliases	None
Inherits	Database
Actor Type	Passive actor
Contact Person	None
Contact Details	None

User Service

Description	User Service is where the request from the user is being processed. It interacts Client end user and database to execute the actions defined by that service and returns the invocation result status back to the system.
Aliases	None
Inherits	None
Actor Type	Active
Contact Person	None
Contact Details	None

Data Manager

Description	Data manager is an inherited type of manager who manages with retrieved data from the World Bank’s database or processed data from the System database, and then delivers data for further use.
Aliases	None
Inherits	Manager
Actor Type	Active
Contact Person	None
Contact Details	None

UI Manager

Description	The UI manager is an actor who manages, displays and removes all the error message windows, viewers and any UI elements. It demonstrates and tunes UI based on the parameter selected.
Aliases	None
Inherits	Manager
Actor Type	Active
Contact Person	None
Contact Details	None

System Database

Description	The system database stores all the retrieved and/or processed data, users' information. Every time when users try to login, demonstrate data on the UI, the system database is called.
Aliases	Noner
Inherits	Database
Actor Type	Passive
Contact Person	None
Contact Details	None

2.2 Use Case Descriptions

This section documents the complete business scenarios within the scope of this project.

2.2.1 XXXX-0001 User Login Scenario

In this scenario, the client user inputs a username-password combination to log in to the system. The main UI of the system will be shown once the combination is verified.

Goal in Context:

To let the client user login to the system and start the main UI.

Actors:

1. Country Statistics Client User
2. UI Manager
3. System Database

Preconditions:

1. The database that stores the user information must be connected to the system.

Trigger:

The client user of the application starts the software.

Scenario Text:

1. UI Manager opens the login window.
2. Client user login to the system.
   2.1. Client user supplies a username-password combination.
   2.2. System database verifies the client user.
   2.3. Use alternative 2 to notify that there is an error with the provided credentials and the application will be terminated.
3. UI Manager opens the main UI.

Alternative Scenario Courses:

1. The username-password combination does not exist in the system database, UI Manager opens a pop-up window containing the error message will be shown and the application will be terminated.

Constraints:

None.

Questions:

None.

2.2.2 XXXX-0002 Analysis Type Selection Scenario

In this scenario, the client user changes the type of analysis they would like to perform to the retrieved data.

Goal in Context:

To initialize the analysis type to be performed on the retrieved data.

Actors:

1. Country Statistics Client User

2. UI Manager

Preconditions:

1. The user must have logged in to the system.

2. The user must have selected the country for which they would like to perform data analysis on.

Scenario Text:

1. Client user selects the analysis type to be performed.

2. UI Manager empties the viewer for this specific analysis type.

2.1. Use alternative 1 if the user selects the same analysis type.

Alternative Scenario Courses:

1. The user selects the same analysis type, the UI Manager will remain all viewers intact.

Constraints:

None.

Questions:

None.

2.2.3 XXXX-0003 Country Selection Scenario

In this scenario, the client user selects the country for which they would like to perform data analysis on.

Goal in Context:

To initialize the analysis the country to be performed data analysis on.

Actors:

1. Country Statistics Client User
2. UI Manager
3. System Database

Preconditions:

1. The user must have logged in to the system.

Scenario Text:

1. Client user selects the country to be performed data analysis on.
2. System database verifies whether this country's data can be fetched.
   2.1. Use alternative 1 if the user selects an invalid country.

Alternative Scenario Courses:

1. The user selects a country which data cannot be fetched, the UI Manager will open an error message window.

Constraints:

None.

Questions:

None.

2.2.4 XXXX-0004 Year Selection Scenario

In this scenario, the client user selects the start and end year of the data to be fetched.

Goal in Context:

To initialize the start and end year of the data to be fetched.

Actors:

1. Country Statistics Client User
2. UI Manager
3. System Database

Preconditions:

1. The user must have logged in to the system.
2. The user must have selected the type of analysis.

Scenario Text:

1. Client user selects the start and end year of the data to be fetched.
2. System database verifies whether data within this period can be fetched.

2.1. Use alternative 1 if the user selects an invalid starting or ending year.

Alternative Scenario Courses:

1. The user selects an invalid starting or ending year, the UI Manager will open an error message window.

Constraints:

None.

Questions:

None.

2.2.5 XXXX-0005 Visualization Graph Manipulation Scenario

In this scenario, the client user adds and removes the visualization graphs that display the data analysis.

Goal in Context:

To add and remove the visualization graphs that display the data analysis.

Actors:

1. Country Statistics Client User

2. UI Manager

3. System Database

Preconditions:

1. The user must have logged in to the system.

Scenario Text:

1. Client user adds a new viewer.

1.2. System database verifies whether the viewer is compatible with the chosen analysis.

1.3. Use alternative 1 if the viewer is incompatible.

2. Client user removes a viewer.

1.2. System database verifies whether the viewer is already in the list of viewers.

1.3. Use alternative 2 if the viewer is not in the list of viewers.

Alternative Scenario Courses:

1. The user adds a viewer that is incompatible with the chosen analysis, the UI Manager will open an error message window.

2. The user removes a viewer that is not in the list of viewers, the UI Manager will open an error message window.

Constraints:

None.

Questions:

None.

2.2.6 XXXX-0006 Analysis Conduction Scenario

In this scenario, the user-specified data analyses are generated and rendered on the main UI.

Goal in Context:

To generate and render the user-specified data analyses on the main UI.

Actors:

1. World Bank's Database
2. User Service
2. Data Manager
3. UI Manager

Preconditions:

1. The user must have logged in to the system.
2. The user must have finished selecting different parameters and pressed Recalculate Button.

Scenario Text:

1. Data Manager gets and processes the specified data.
   1.1. User Service sends a request to retrieve data.
   1.2. The World Bank's Database responds with the requested data.
   1.3. User Service passes the data to the Data Manager.
   1.4. Data Manager processes and performs analysis on the retrieved data corresponding to user specification.

Alternative Scenario Courses:

None.

Constraints:

None.

Questions:

None.

2.2.7 XXXX-0007 Result Display Scenario

In this scenario, the system displays the data analysis on the main UI.

Goal in Context:

To display the data analysis on the main UI.

Actors:

1. UI Manager
2. Data Manager

Preconditions:

1. The user must have logged in to the system.
2. The required data must have been retrieved and processed.

Scenario Text:

1. Data Manager sends the processed data to the UI Manager.
2. UI Manager renders the result on the main UI.

Alternative Scenario Courses:

None.

Constraints:

None.

Questions:

None.

2.3 Use Case Diagrams

This section presents the business scenarios of the subject area in a graphical form.

User Login System

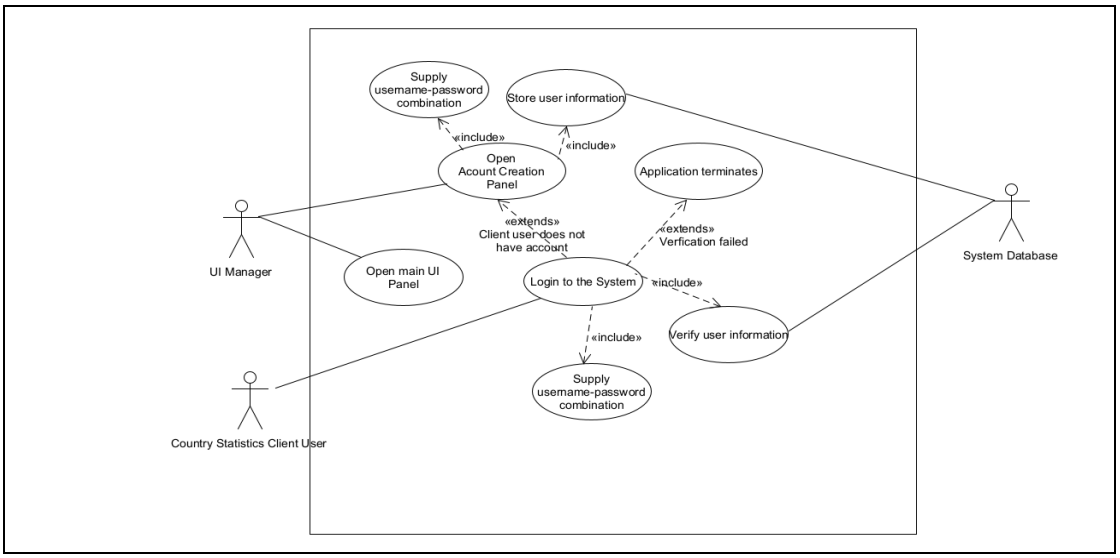

Fig. 2.3.1 Use Case Diagram for Scenario 2.2.1

Analysis Type Selection System

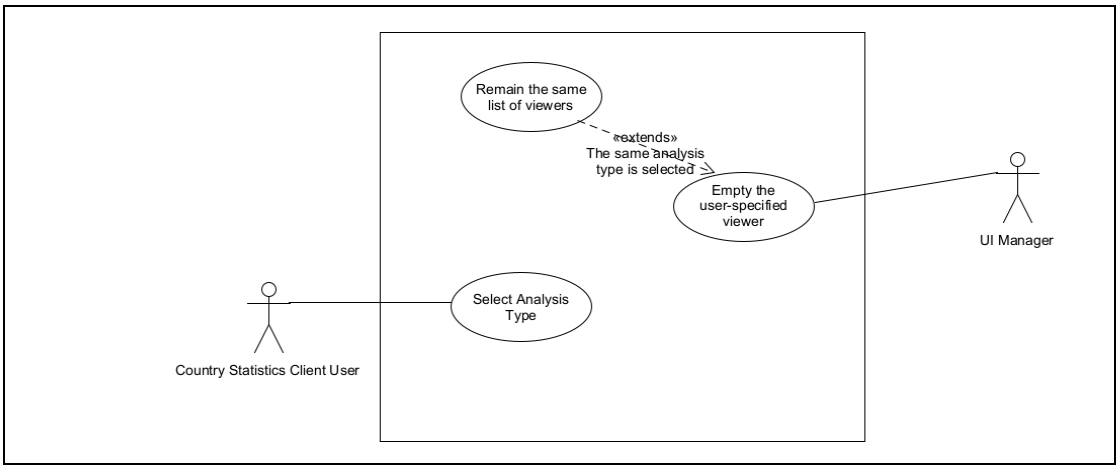

Fig. 2.3.2 Use Case Diagram for Scenario 2.2.2

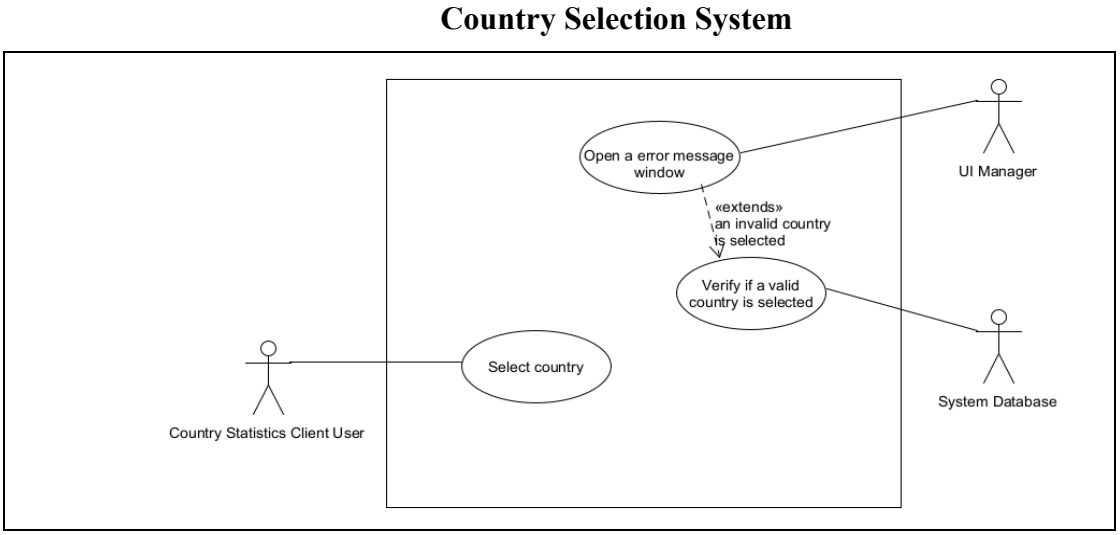

Fig. 2.3.3 Use Case Diagram for Scenario 2.2.3

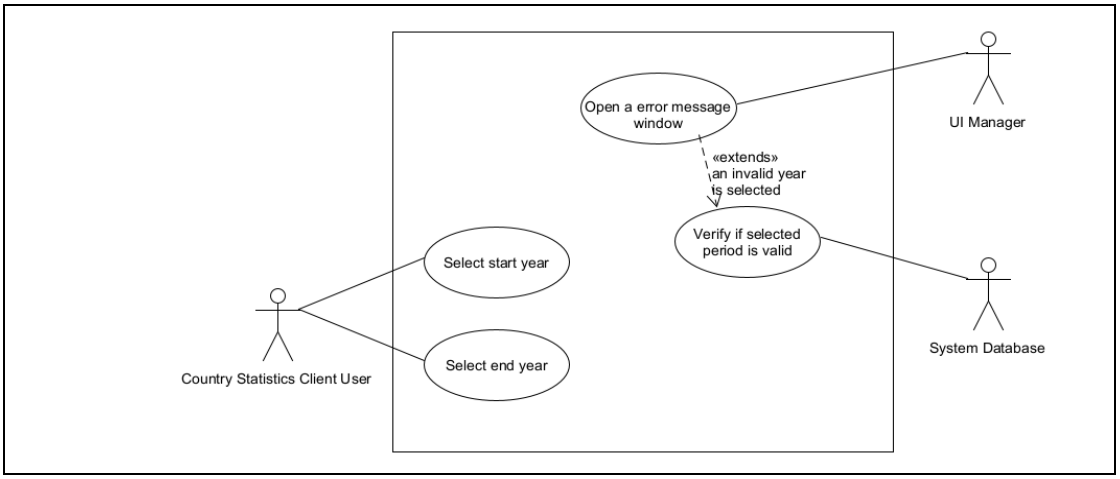

Fig. 2.3.4 Use Case Diagram for Scenario 2.2.4

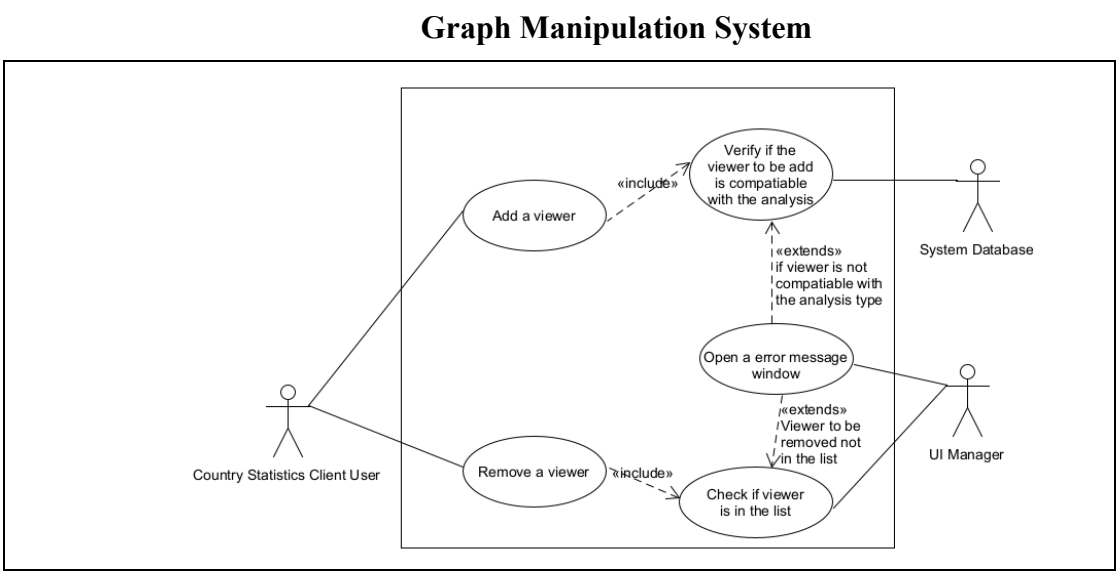

Fig. 2.3.5 Use Case Diagram for Scenario 2.2.5

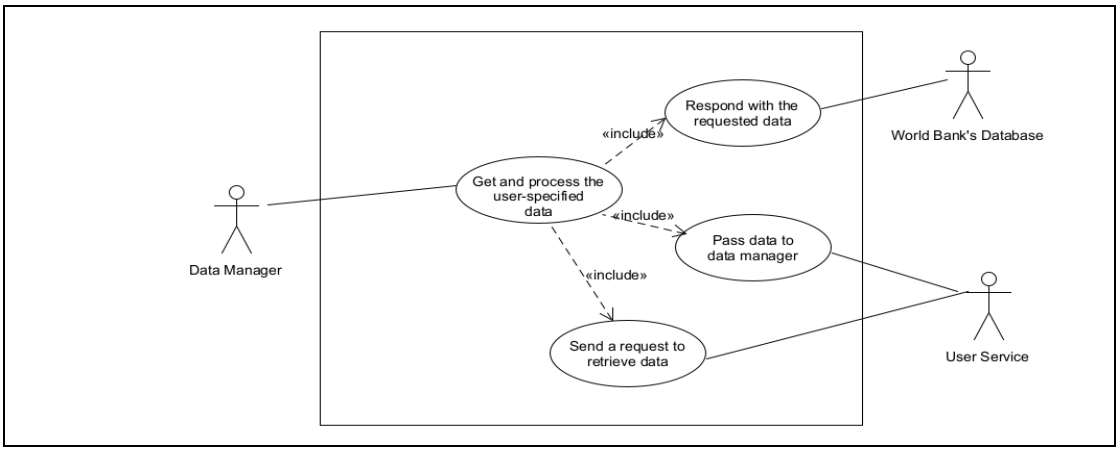

Fig. 2.3.6 Use Case Diagram for Scenario 2.2.6

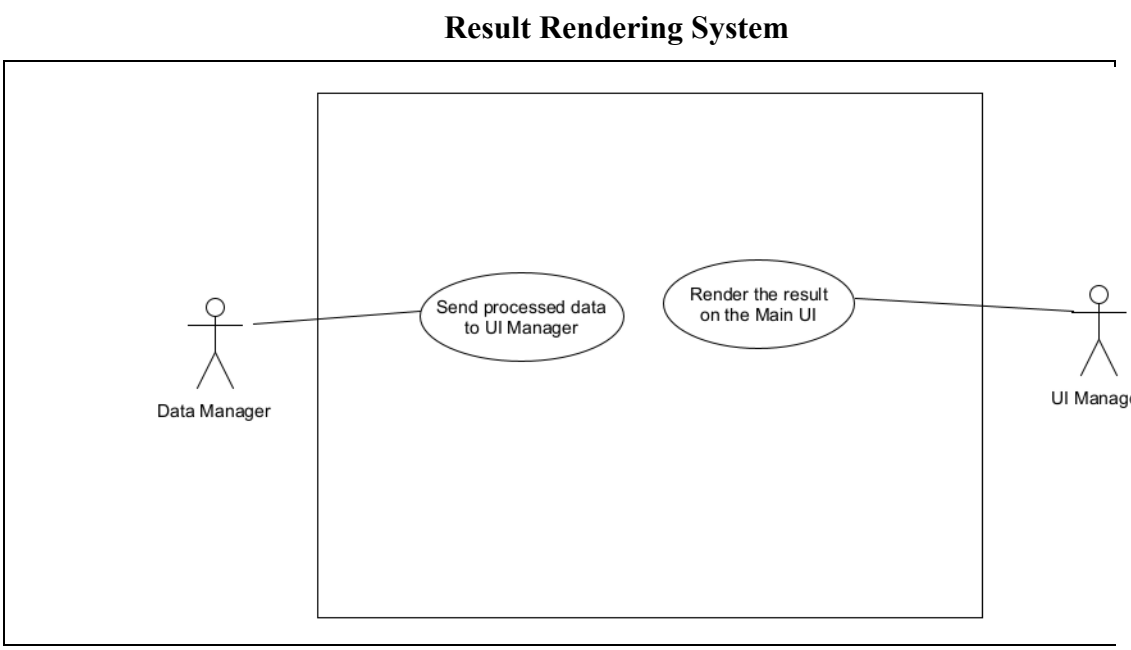

Fig. 2.3.7 Use Case Diagram for Scenario 2.2.7

3 Domain Model

3.1 Domain Model Class Diagram

The domain model class diagram for the Country Statistics System appears below:

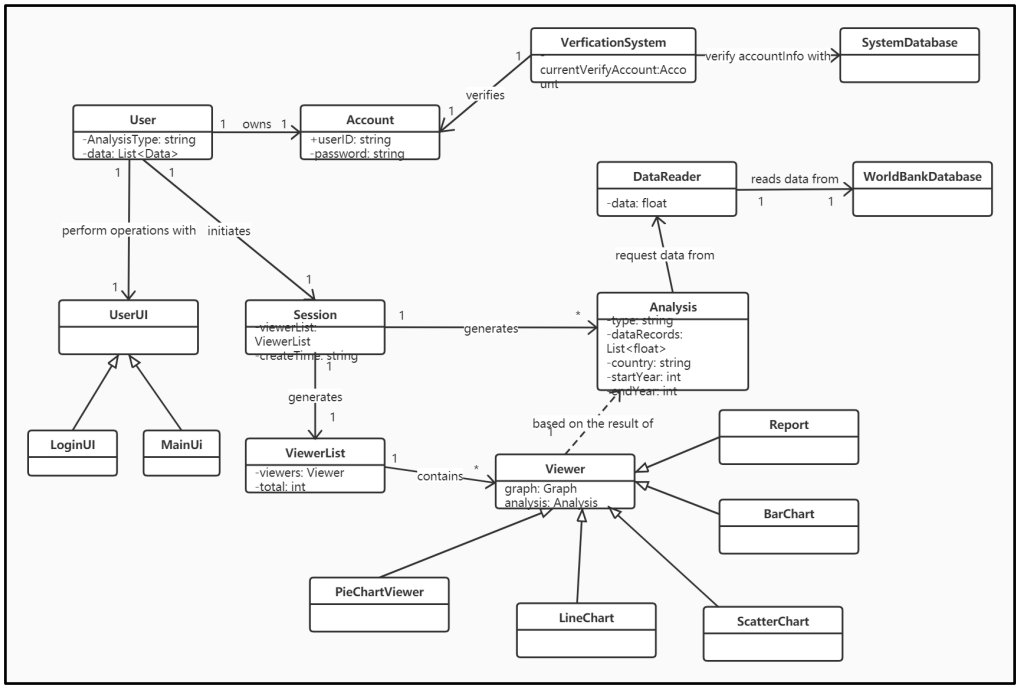

Fig. 3.1 Domain Model Class Diagram

3.2 Domain Model Class Definitions

3.2.1 Country Statistics Client User

Description	This object represents the user of Country Statistics software in the context of the domain. This is a human user that can provide the credentials to log into the system and select the analysis type, country and duration of the analysis to be performed.
Attributes	username: String
Responsibilities	This user is responsible for providing credentials to the Login UI, and selecting the analysis type, country and duration of the analysis to be performed for the Main UI.
Business Rules	

3.2.2 System Database

Description	This object represents the System Database that stores username-password combinations and checks whether a combination exists in the database.
Attributes	credentialExists: Boolean
Responsibilities	The System Database is responsible for receiving username-password combinations from the Login UI and returns whether the credential exists or not to back to the Login UI. It is
Business Rules	

3.2.3 World Bank's Database

Description	This object represents the World Bank's Database which stores the datasets needed to create the Viewers.
Attributes	dataType: String dataset: jsonFile
Responsibilities	The World Bank's Database is responsible for providing the requested dataset to the User Service.
Business Rules	

3.2.4 Login UI

Description	This object represents a user interface which allows users to log into the system. Users have direct access to it. It is connected to the System Database in order to check the given username-password combination.
Attributes	inputUsername: String inputPassword: String
Responsibilities	A login UI object is responsible for forwarding the username and password information obtained from the user to the System Database. If the combination exists in the System Database, it calls the UI Manager to invoke the Main UI. If it does not exist, it calls the UI Manager to invoke the Error UI and terminates the whole program.
Business Rules	

3.2.5 Main UI

Description	This object represents the Main UI which receives the country, duration, analysis type and selected viewers from the user. Inquiry of specific dataset required to plot the viewers are sent to the World Bank's Database so that the Main UI receives the data, analyses it if needed and invokes the viewers.
Attributes	countrySelection: String beginYear: int endYear: int analysisType: String viewerDisplayed: Viewer
Responsibilities	This Main UI is responsible for receiving the parameters for visualization from the User. Once an analysis type that is different from the previous selection is chosen, the Main UI closes all the presenting Viewer windows. Once the User hits the button "recalculate", the Main UI is then responsible for sending requests and receiving the processed dataset needed for creating the viewers to and from the UI Manager, and invoking the Viewer. When the parameter combination entered by the User is prohibited or if the User tries to remove a Viewer that is not presenting, the Main UI calls the UI Manager to invoke the Error UI.
Business Rules	

3.2.6 Error UI

Description	This object represents the pop-up window used to display error messages.
Attributes	errorMessage: String
Responsibilities	Serves as a pop-up window displaying the appropriate error message when called by the UI Manager.
Business Rules	

3.2.7 UI Manager

Description	This object represents the UI Manager that manages, calls and removes all the Error UI windows, Viewers and other UI elements.
Attributes	credentialExists: Boolean
Responsibilities	The UI Manager invokes and closes all UI in this program. When called by the Login UI, the UI Manager invokes the Main UI when the login process is successful, or invokes the Error UI and terminates the whole program when the login process is unsuccessful. When called by the Main UI, the UI Manager invokes the Error UI or receives data requests from the Main UI and forward the requests to the Data Manager. When called by the Data Manager, the UI Manager calls the Main UI to display the Viewers.
Business Rules	

3.2.8 Data Manager

Description	This object represents the Data Manager that handles the data requests and processes the raw data received.
Attributes	
Responsibilities	When called by the UI Manager, the Data Manager is responsible for forwarding the data request to the User Service and processing the raw data received from the User Service so it can be used to generate the Viewers. It then sends the processed data to the Viewers and calls the UI Manager to display the Viewer windows.
Business Rules	

3.2.9 User Service

Description	This object represents the User Service that receives requests from the Main UI, interacts with the World Bank's Database and sends the raw data to the Data Manager.
Attributes	
Responsibilities	When called by the Data Manager, the User Service is responsible for obtaining the datasets requested from the World Bank's Database and sending the raw data to the Data Manager.
Business Rules	

3.2.10 Viewer

Description	This object represents the Viewer that visualises the obtained or computed data based on the User's requests.
Attributes	countrySelection: String beginYear: int endYear: int analysisType: String
Responsibilities	When invoked by the Main UI, the Viewers are responsible to plot the graphs with the processed data obtained from the Data Manager.
Business Rules	

4 Sequence and Activity Diagrams

4.1 Sequencing Diagrams

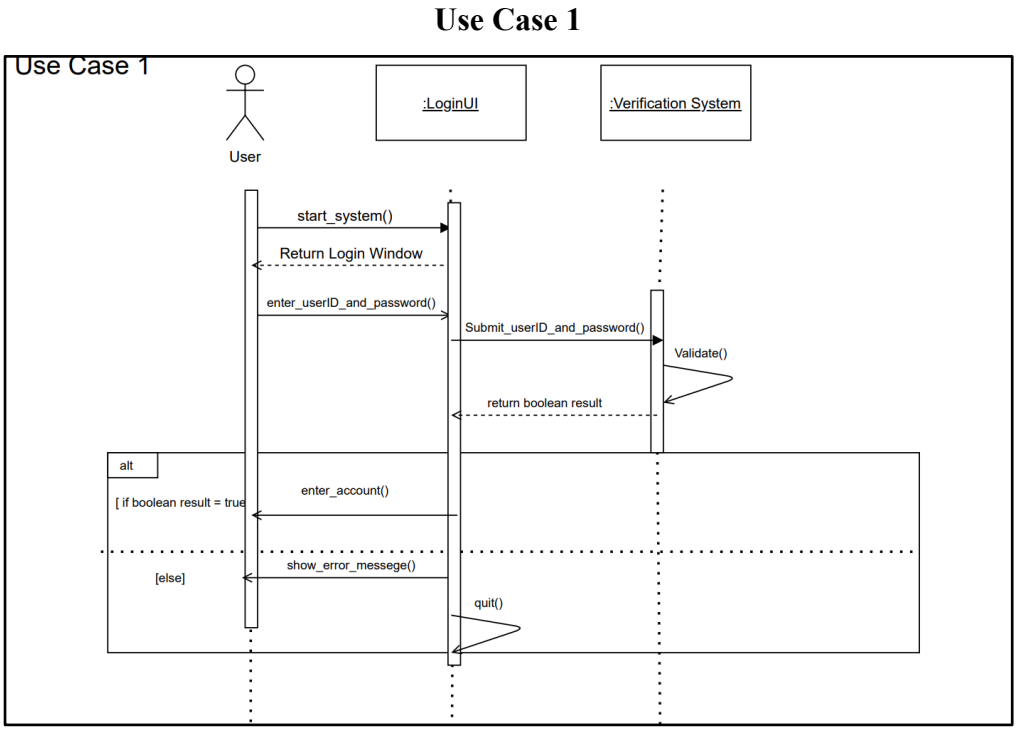

Fig. 4.1.1 Sequencing Diagram for Use Case 1

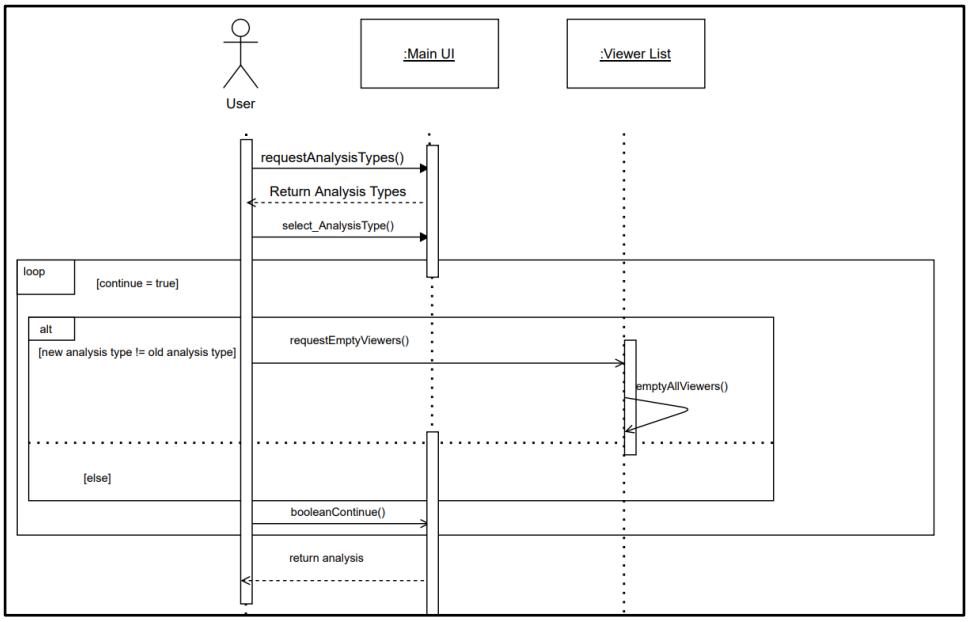

Fig. 4.1.2 Sequencing Diagram for Use Case 2

Use Case 3

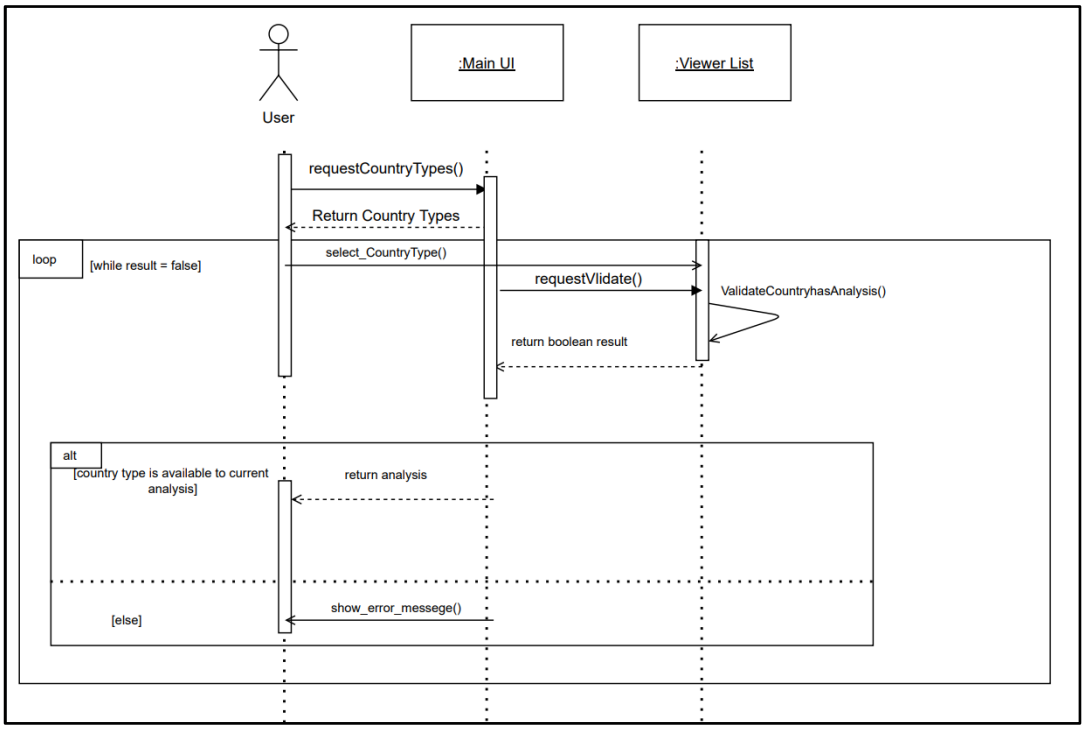

Fig. 4.1.3 Sequencing Diagram for Use Case 3

Use Case 4

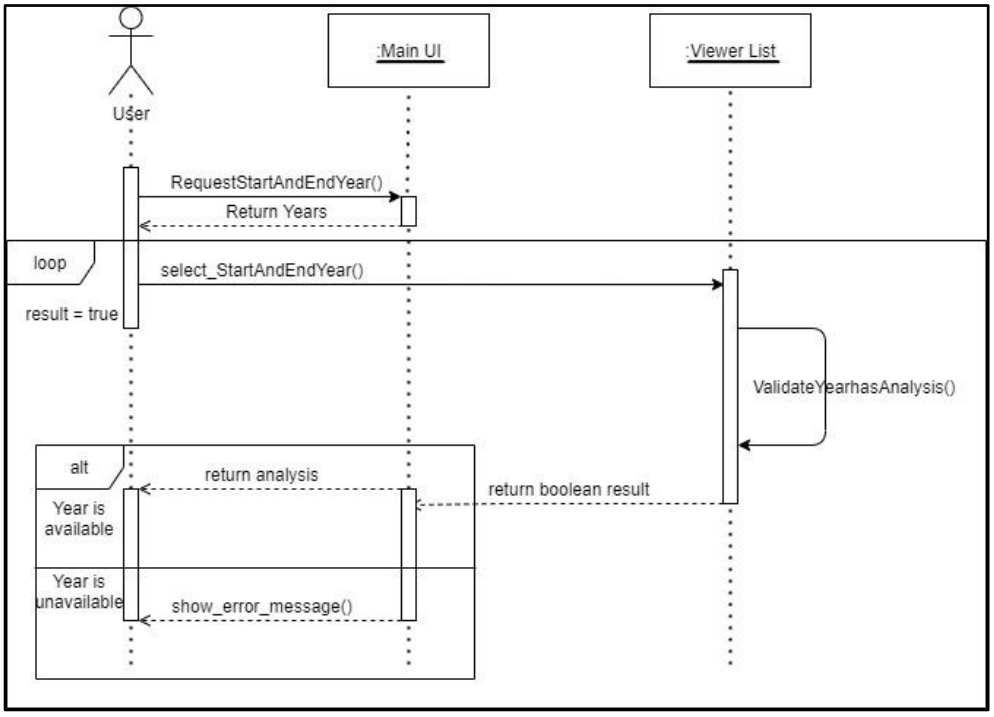

Fig. 4.1.4 Sequencing Diagram for Use Case 4

Use Case 5-6

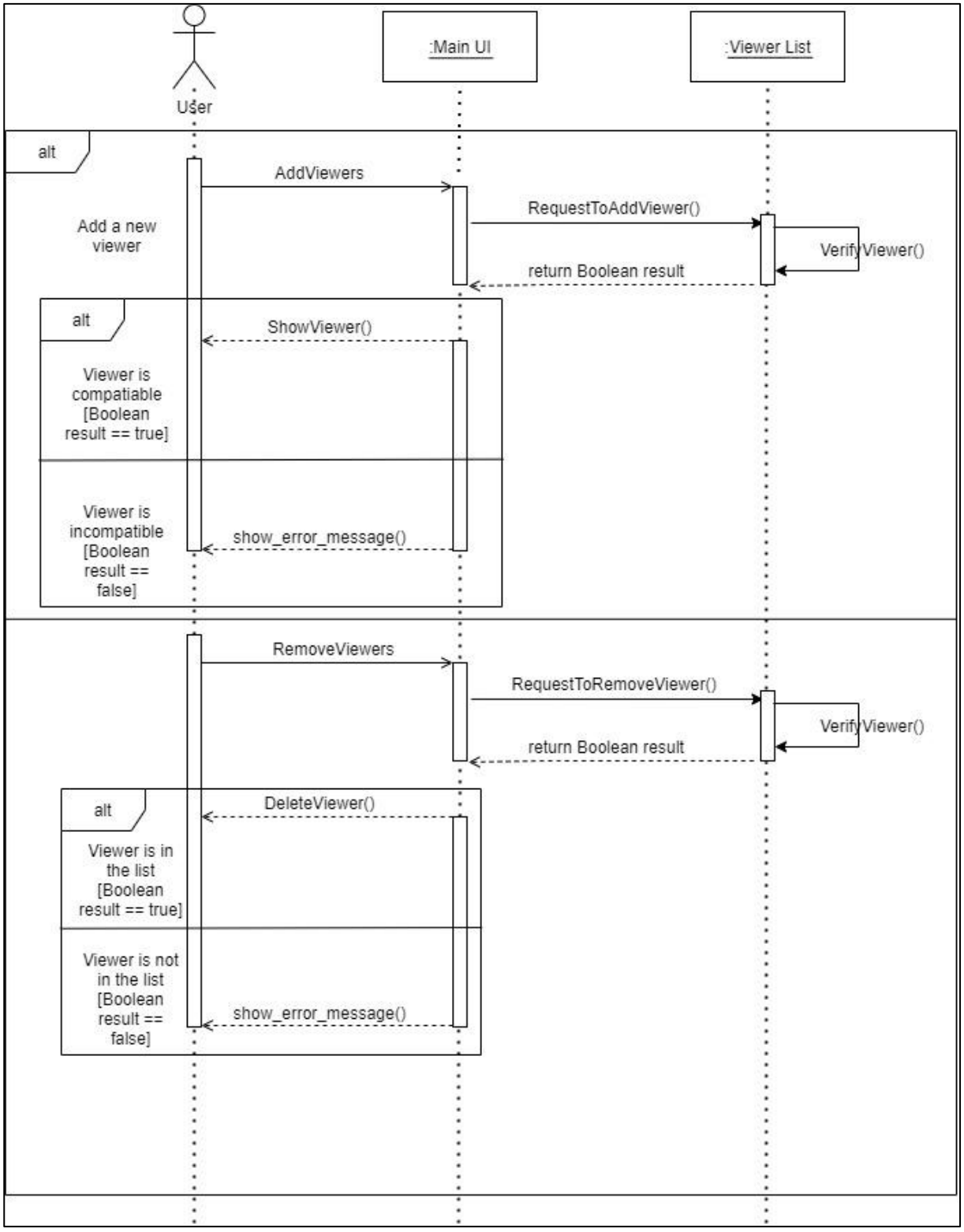

Fig. 4.1.5 Sequencing Diagram for Use Case 5-6

Use Case 7

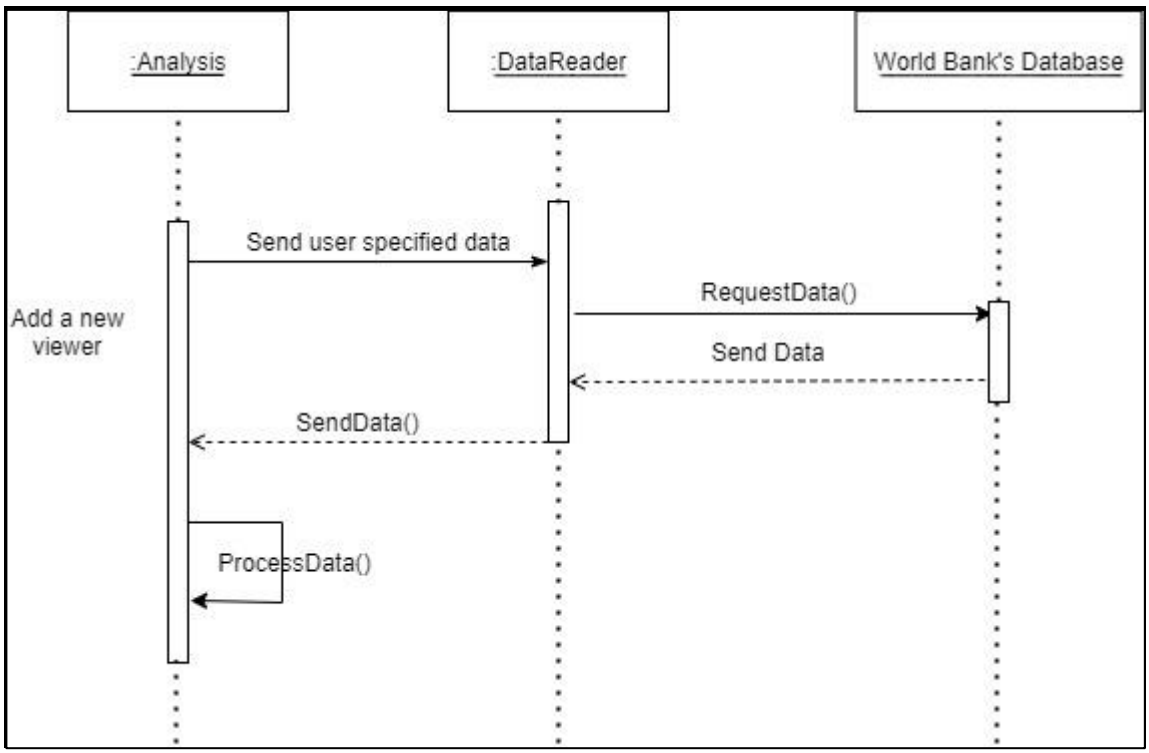

Fig. 4.1.6 Sequencing Diagram for Use Case 7

Use Case 8

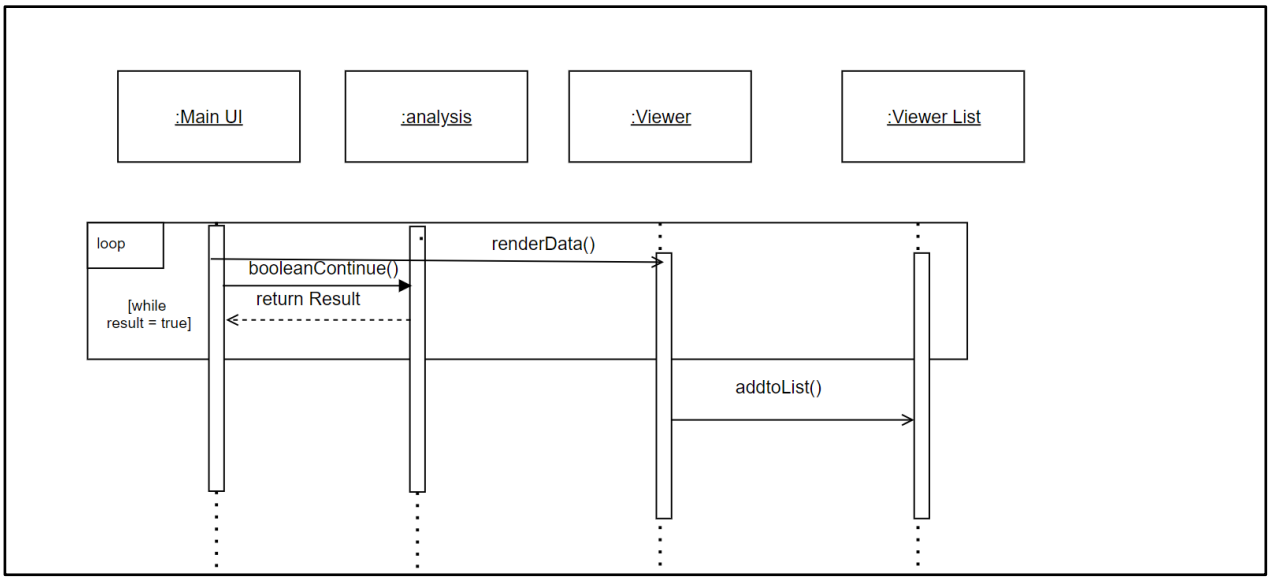

Fig. 4.1.7 Sequencing Diagram for Use Case 8

4.2 Activity Diagrams

Use Case 1

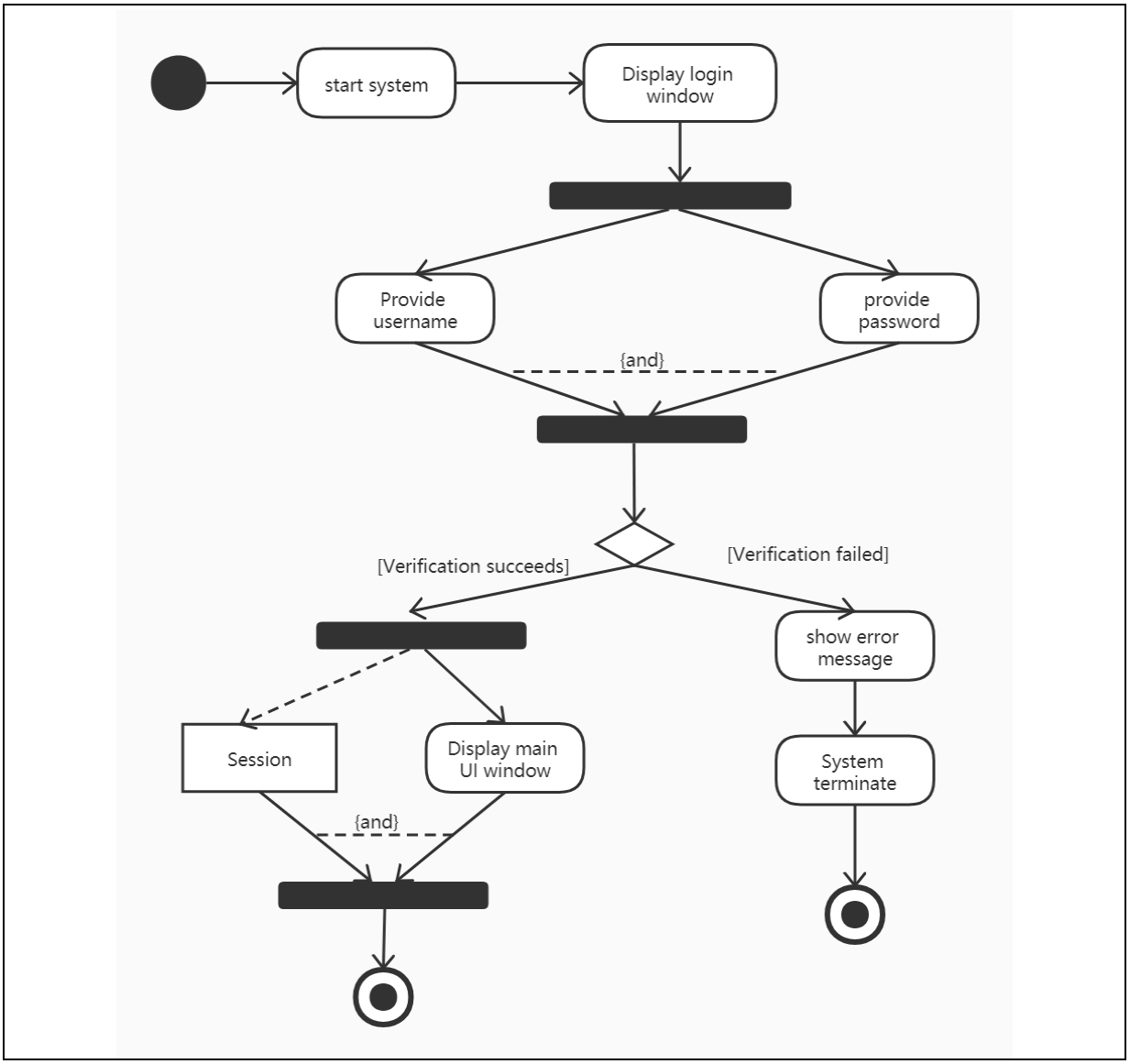

Fig. 4.2.1 Activity Diagram for Use Case 1

Use Case 2

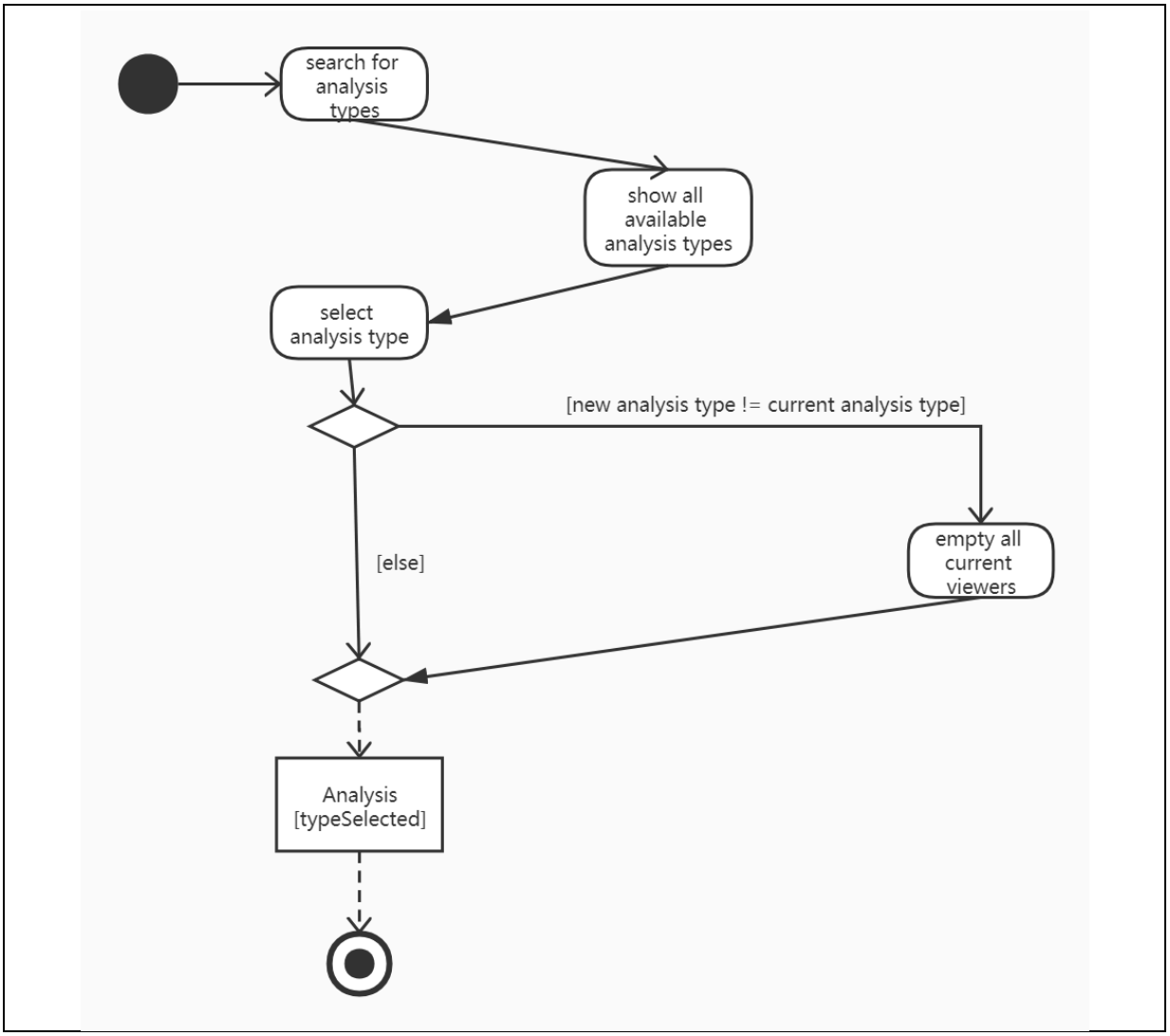

Fig. 4.2.2 Activity Diagram for Use Case 2

Use Case 3

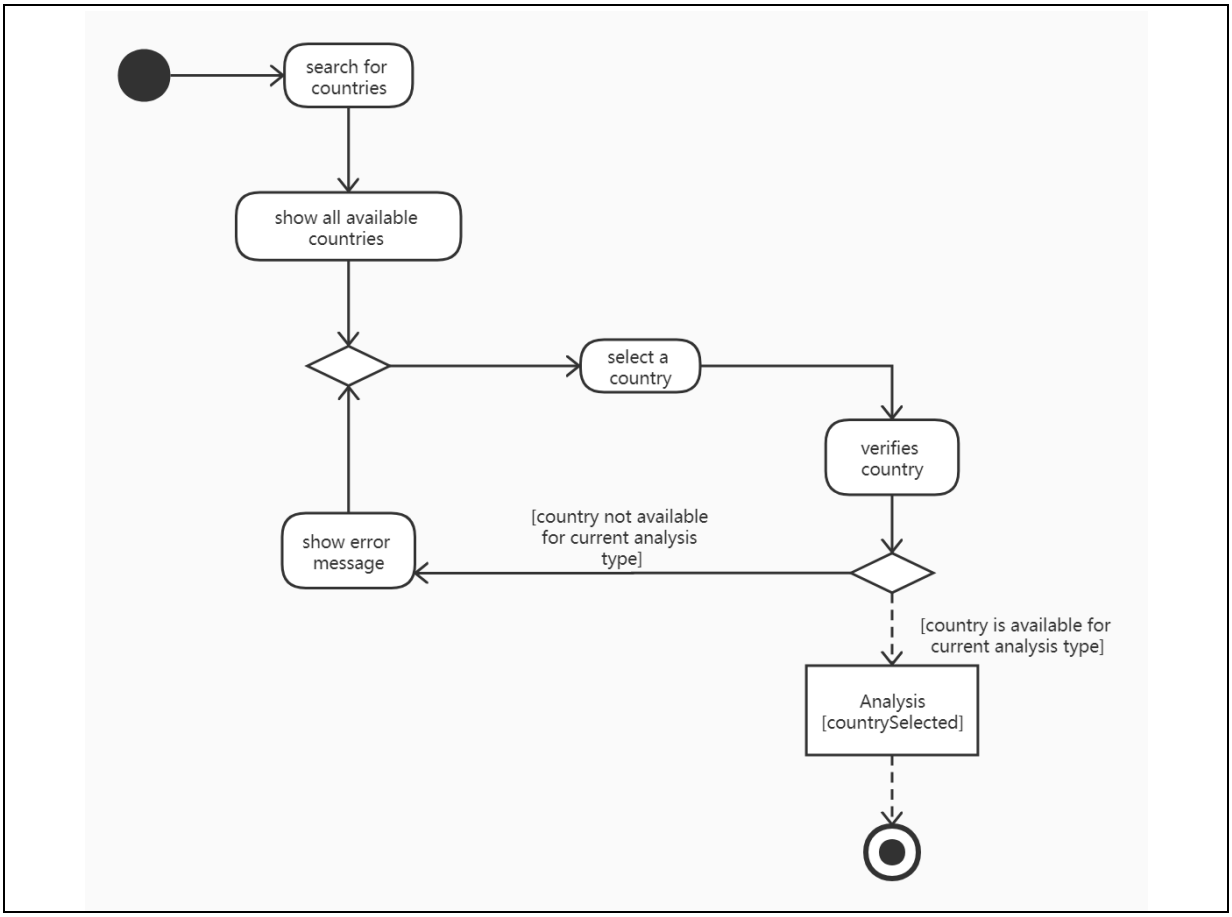

Fig. 4.2.3 Activity Diagram for Use Case 3

Use Case 4

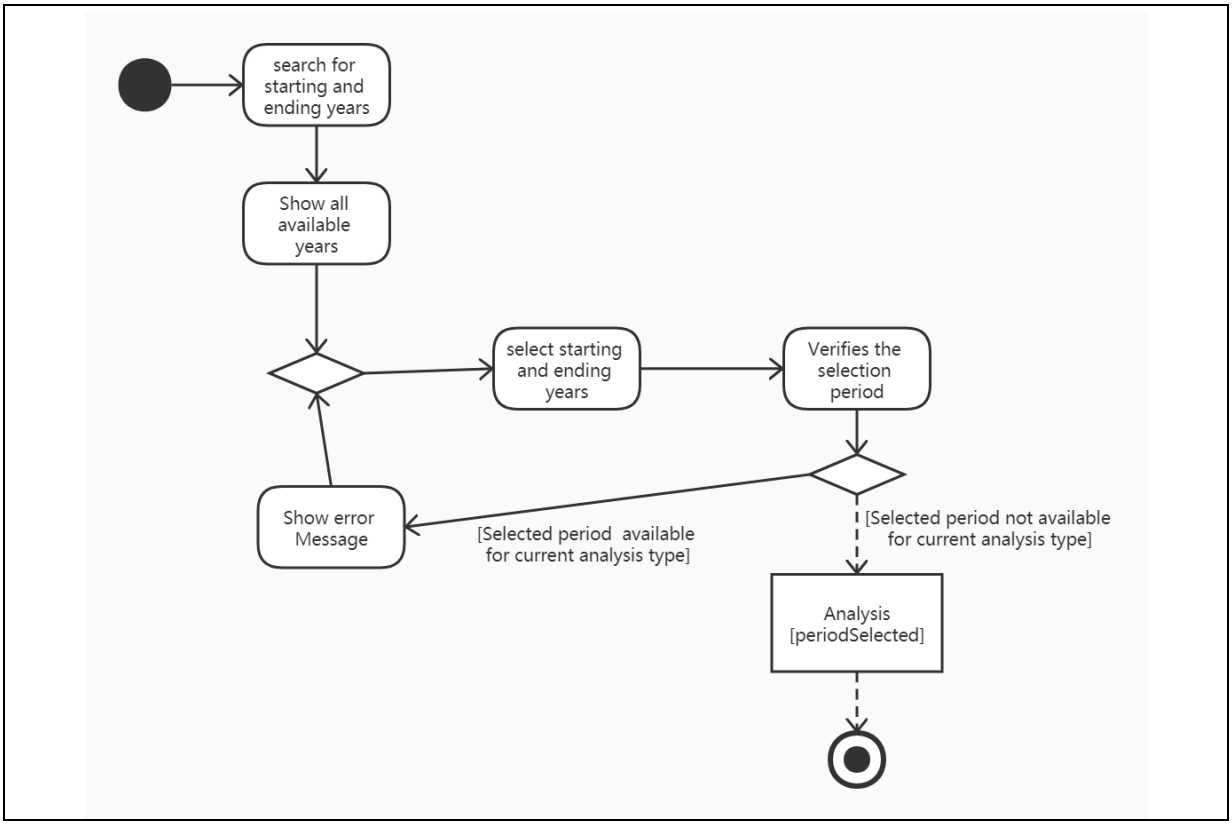

Fig. 4.2.4 Activity Diagram for Use Case 4

Use Case 5-6

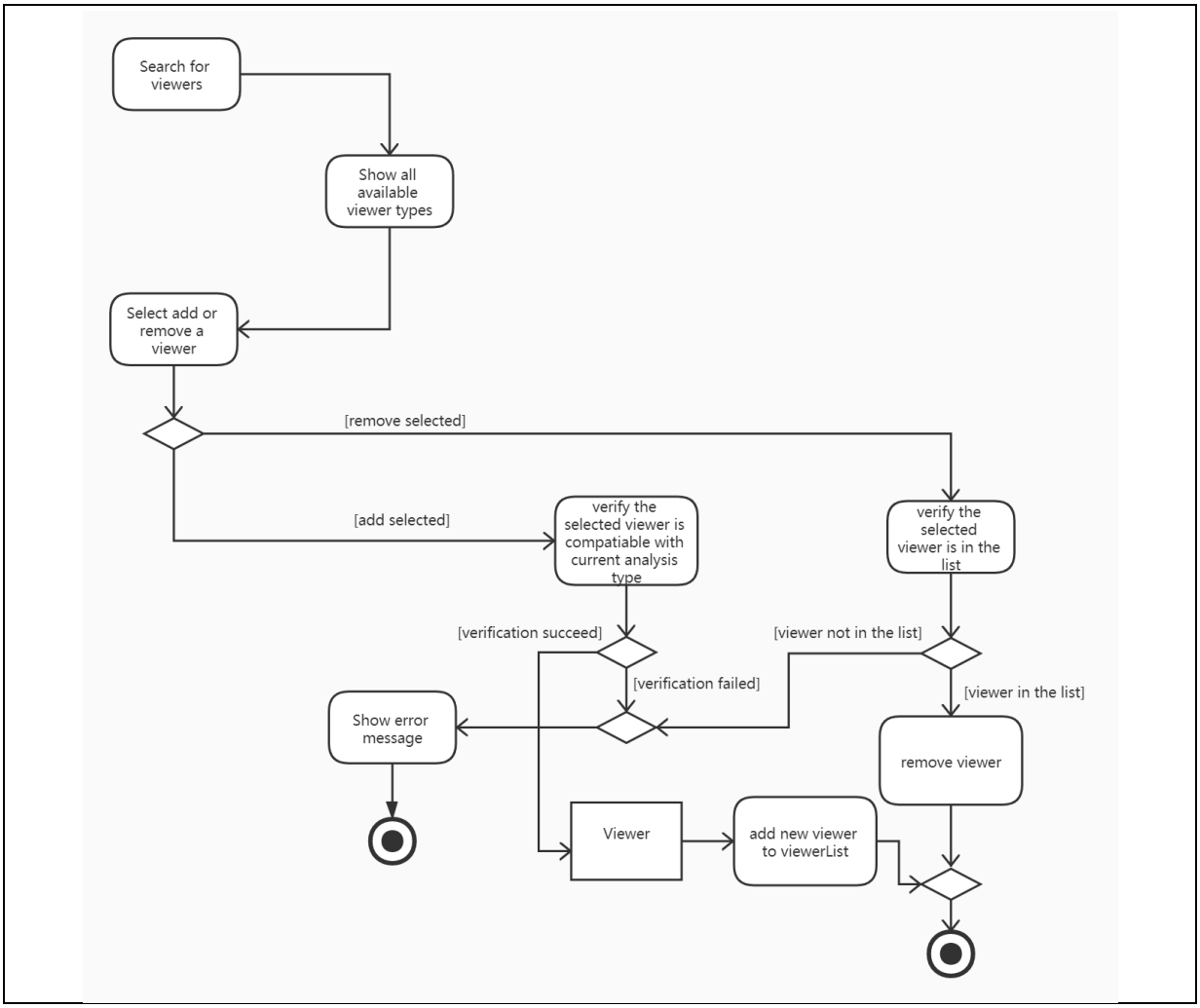

Fig. 4.2.5 Activity Diagram for Use Case 5-6

Use Case 7

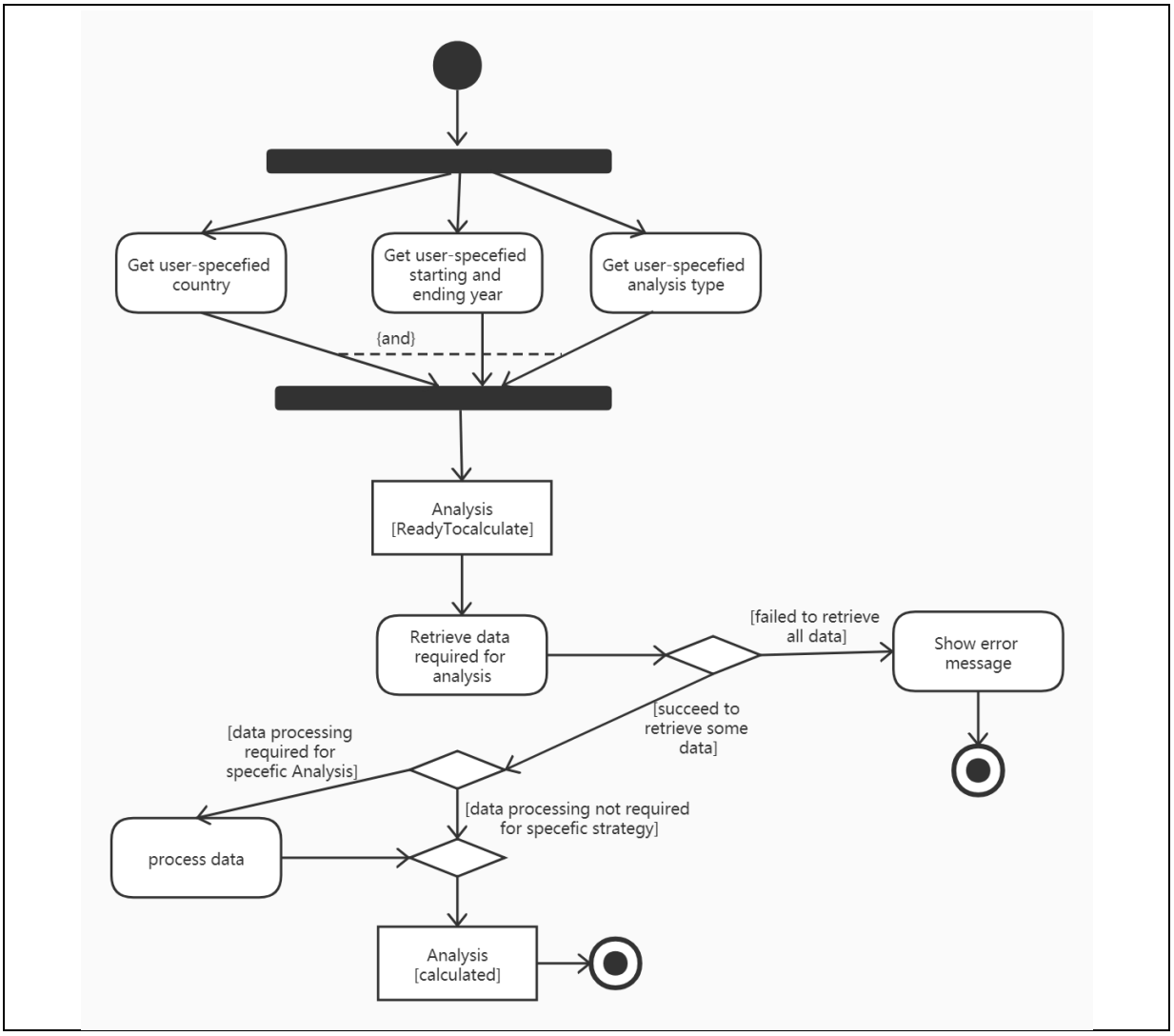

Fig. 4.2.6 Activity Diagram for Use Case 7

Use Case 8

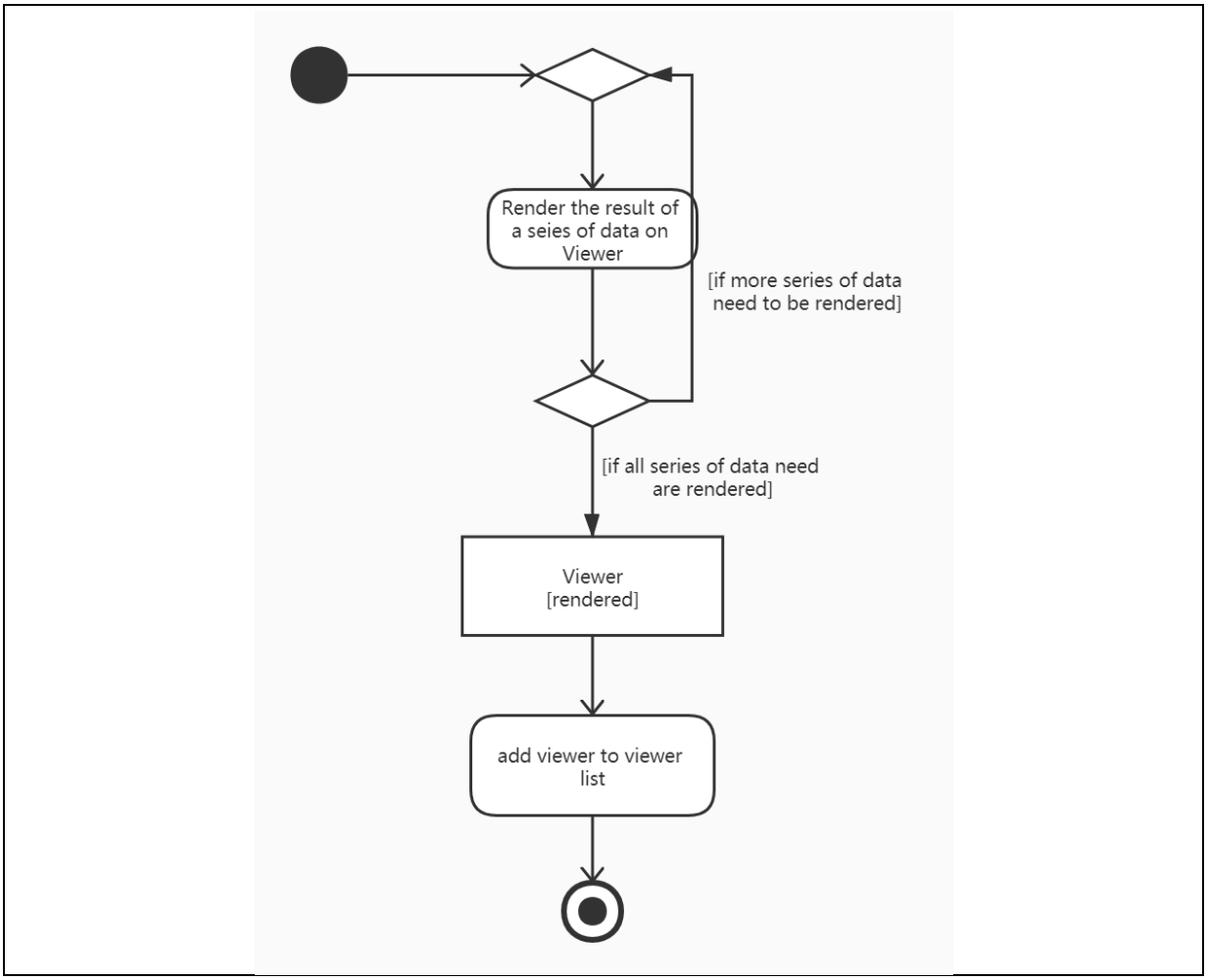

Fig. 4.2.7 Activity Diagram for Use Case 8

5 Non-Functional Requirements Specification

5.1 Overview

The non-functional requirements of the system comprises utilities, environments and other specifications that are necessary for the smooth operation of the system as a whole. This includes interfaces, development environment, capacity specifications, network and operational parameters.

5.2 Enabling Technologies

5.2.1 Target Development Environment

The system should be developed in a Windows environment and using Java. Eclipse 4.14.0 will be the Integrated Development Environment (IDE) used for coding purposes.

5.2.2 System Interfaces

Sample code to extract raw data from the World Bank Indicators API is provided and used. A wrapper class used to invoke the various UI and Viewers, would be created.

5.3 Capacity Planning

5.3.1 Permanent Storage

In order to be reliable RAID 1 mirroring will be used on the server. This ensures that if one of the disks fails the other disk functions as a single hard drive until the faulty one is replaced. For system installation and activity logging, the disk size used will be 20 GB. Most of that space would be occupied by viewer type information.

5.4 Network

The system should have connectivity to the Internet with bandwidth of at least 25 Mbps. Furthermore, the network should possess efficient packet switching protocols such as MultiProtocol Layer Switching (MPLS) that will transmit the signals without skips or delays.

5.5 Workstations

The minimum system requirements and configurations for the computers used for the development, deployment and execution of the system are:

A hard disk space of 3GB to install Windows and the Country Statistics software. A processor speed of 300 MHz and memory of 50 MB is sufficient. A display setting of 1024 x 768 resolution and a 16-bit color palette should be used. The computer should have connectivity to a LAN with bandwidth of at least 25 Mbps.

5.6 Operational Parameters

5.6.1 Useability

The system should be learnable and usable by the average computer user. The GUI will be designed in such a way that the buttons are conspicuous and meaningful making it easy to access all the functions of the system. All viewers should load in 2 seconds or less.

5.6.2 Reliability

The backup and recovery functions of the system will consist of snapshots which will be taken at regular intervals and stored somewhere external to the system. The Mean Time To Repair should be minimized which will in turn minimize Mean Time Between Failures. The Country Statistics Data Analysis & Visualization System probability of failure on demand (POFOD) shall be 0.0001 (1 out of 10000 graphics displays) when a user chooses to display a viewer. Routine software upgrades shall be applied no more frequently than once every one month.

5.6.3 Maintainability

Country Statistics Data Analysis & Visualization System shall be easy to be analysed, changed or tested. When an update failure is detected, all updates performed during the failed session shall be rolled back to restore the data to pre-session condition. The mean preventative maintenance time on applying routine plug-in updates to the World Bank API shall be less than 30 minutes every 1 month. Every registered user will have access to the help desk via email.

5.6.4 Portability

Country Statistics Data Analysis & Visualization System shall be able to be installed, run and uninstalled on Windows 7 and Windows 10 operating systems. It shall be able to handle various installation interruption exceptions and unsatisfied prerequisites for installation. It shall be compatible with operating systems in various international languages such as Chinese, English and French.

6 Activities Plan

6.1 Gantt Chart

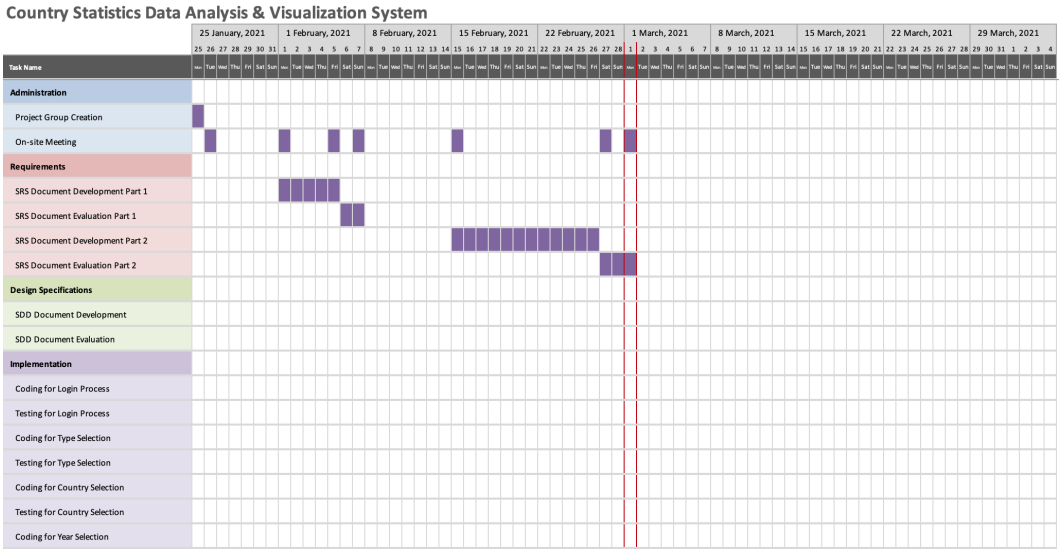

Fig. 6.1 Gantt Chart

6.2 Project Backlog and Sprint Backlog

Story	Estimation	Priority	Status
As a user I want to be able to login to the system.	2	1	To be started
As a user I want to select a particular type to analyze data.	3	2	To be started
As a user I want to select a particular country to analyze data.	1	3	To be started
As a user I want to select a particular year to analyze data.	2	4	To be started
As a user I want to see the reports and graphs representing the selected data.	4	5	To be started
As a user I want to add or remove visualization graphs	2	6	To be started

As a user I want to see the error message when I enter incorrect credentials or perform an invalid operation.	1	7	To be started.
Total	15		

6.3 Group Meeting Logs

Present Group Members	**Meeting Date**	**Issues Discussed / Resolved**
Yiran Shao; Junyi Yang; Zheng Yang; Rui Zhu	26 January, 2021	1. Meeting was held through online-phone call. 2. General discussion about the project. 3. Created a timetable for future meetings. 4. Brainstormed the product backlog list for this project. 5. Decided to meet again on 1st February.
Yiran Shao; Junyi Yang; Zheng Yang; Rui Zhu	1 Feb, 2021	1. Meeting was held through online-phone call. We, 2. assigned parts for each group member; which parts may often connect between assigned members; 3. Discussed what actors or functionalities we may need in our project -- relevant diagrams should come out before the next meeting; which parts may require extra collaborations between members; 4. Decided to meet again on 5th February.
Yiran Shao; Junyi Yang; Zheng Yang; Rui Zhu	5 Feb, 2021	1. Meeting was held through online-phone call. A generalized version of the actor diagram and user case came out.

		2. We added some extra actor type of managers for some invocation of functionality. 3. Administrator actors were removed from our actor diagrams. 4. Some analysis of user cases used in each scenario came out.
Yiran Shao; Junyi Yang; Zheng Yang; Rui Zhu	7 Feb, 2021	1. Meeting was held through online-phone call. During this meeting, 2. Went through all the details that were mentioned in the assignment description. 3. Finalized the deliverable for the first assignment.
Yiran Shao; Junyi Yang; Zheng Yang; Rui Zhu	15 Feb, 2021	1. Meeting was held through online-phone call. During this meeting, 2. Went through the requirements for part 2 of the SRS document 3. Assigned development tasks to group members 4. Decided to meet again on Feb 27
Yiran Shao; Junyi Yang; Zheng Yang; Rui Zhu	27 Feb, 2021	1. Meeting was held through online-phone call. During this meeting, 2. Went through the completed sections of SRS document part 2 3. Assigned evaluation tasks to group members 4. Decided to finalize the document on March 1

7 Test Driven Development

Test ID	0001
Category	evaluation of user credentials stored on DB
Requirements Coverage	UC1-Successful-User-Login
Initial Condition	the system has been initiated and runs
Procedure	1. The user selects login 2. The user provides a user name 3. The user provides a password 4. The user logs-in into the system and is presented with the main UI window
Expected Outcome	the login UI closes, and the user is greeted with the main UI panel
Notes	the user should provide a password with at least 8 characters and contains only letters and digits.

Test ID	0002
Category	evaluation of user credentials stored on DB
Requirements Coverage	UC1-Unsuccessful-User-Login
Initial Condition	the system has been initiated and runs
Procedure	1. The user selects login 2. The user provides a combination of username and password that is not stored in the database. 4. The user receives an error message and exits the system.
Expected Outcome	the system terminates.
Notes	the user should provide a password with at least 8 characters and contains only letters and digits.

Test ID	0003
Category	evaluation of analysis types that can be performed by system
Requirements Coverage	UC2-Selection-of-a-New-Analysis-Type
Initial Condition	the user has logged into the system.
Procedure	1. The user selects analysis type. 2. The user selects an analysis type that is different than their previous selection. 4. The viewer list on the main UI is emptied.
Expected Outcome	The viewer list on the main UI is emptied.
Notes	The user can only select analysis types that are provided and implemented by the system.

Test ID	0004
Category	evaluation of analysis types that can be performed by system
Requirements Coverage	UC2-Selection-of-an-Existing-Analysis-Type
Initial Condition	the user has logged into the system.
Procedure	1. The user selects analysis type. 2. The user selects an analysis type that is the same with their previous selection.
Expected Outcome	None.
Notes	The user can only select analysis types that are provided and implemented by the system.

Test ID	0005
Category	evaluation of the available countries stored in the DB.
Requirements Coverage	UC3-Selection-of-an-Available-Country
Initial Condition	the user has selected the analysis type to be performed.
Procedure	1. The user selects a country from the list which data is available for currently selected analysis type.
Expected Outcome	None.
Notes	The user can only select countries that are provided and implemented by the system.

Test ID	0006
Category	evaluation of the unavailable countries stored in the DB.
Requirements Coverage	UC3-Selection-of-an-Unavailable-Country
Initial Condition	the user has selected the analysis type to be performed.
Procedure	1. The user selects a country from the list which data is available for currently selected analysis type. 2. The user receives an error message and is asked to re-select the country.
Expected Outcome	The user receives an error message.
Notes	The user can only select countries that are provided in the list.

Test ID	0007
Category	evaluation of the available years stored in the DB.
Requirements Coverage	UC4-Selection-of-an-Available-Duration
Initial Condition	the user has selected the country to perform the analysis on.
Procedure	1. The user selects a starting and ending year from the list which data is available for currently selected analysis type and country.
Expected Outcome	None.

Notes	The user can only select years that are provided and implemented by the system.

Test ID	0008
Category	evaluation of the available years stored in the DB.
Requirements Coverage	UC4-Selection-of-an-Unavailable-Duration
Initial Condition	the user has selected the country to perform the analysis on.
Procedure	1. The user selects a starting and ending year from the list which data is unavailable for currently selected analysis type and country. 2. The user receives an error message and is asked to re-select the years.
Expected Outcome	The user receives an error message
Notes	The user can only select years that are provided and implemented by the system.

Test ID	0009
Category	evaluation of Adding or Removing Viewers
Requirements Coverage	UC5-Adding-Viewer
Initial Condition	the user has selected the analysis type.
Procedure	1. The user selects a graph that is in the available graph list. 2. The user presses the “add” button. 3. The corresponding graph is added to the viewer list.
Expected Outcome	None
Notes	The user can only select graphs that are compatible with the current analysis type.

Test ID	0010
Category	evaluation of Adding or Removing Viewers
Requirements Coverage	UC5-Adding-Viewer
Initial Condition	the user has selected the analysis type.
Procedure	1. The user selects a viewer from the drop-down menu that is not in the available graph list 2. The user presses the “add” button
Expected Outcome	The user receives an error message
Notes	The user can only select graphs that are compatible with the current analysis type.

Test ID	0011
Category	evaluation of Adding or Removing Viewers
Requirements Coverage	UC6-Remove-Viewer
Initial Condition	the user has selected the analysis type.
Procedure	1. The user selects a graph from the graph list. 2. The user presses the “remove” button. 3. The corresponding graph is removed from the viewer list.
Expected Outcome	The corresponding graph is removed from the viewer list.
Notes	The user can only remove viewers that are currently in the viewer list.

Test ID	0012
Category	evaluation of Adding or Removing Viewers
Requirements Coverage	UC6-Removing-Viewer
Initial Condition	the user has selected the duration within which the analysis is performed.
Procedure	1. The user selects a viewer from the drop-down menu that is not in the viewer list 2. The user presses the “remove” button
Expected Outcome	The user receives an error message
Notes	The user can only select viewers that are already in the list of viewers.

Test ID	0013
Category	evaluation of Analysis Result
Requirements Coverage	UC7-and-UC8-Display-Result
Initial Condition	the user has set all the parameters for the currently selected analysis type.
Procedure	1. The user presses the recalculate button. 2. The main UI calculates and shows the viewer list contains all graphs and data analysis.
Expected Outcome	The corresponding graphs and data are shown on main UI.
Notes	None

8 Domain Dictionary (optional and as required)

8.1 Terms and Abbreviations

Term	Definition
Place term here	*Place a definition of the term here. Make the definition short and concise and consistent with other terms. Only used terms defined elsewhere in the domain dictionary.*
Place synonym here	*This is a synonym of <another term>*