SOEN 6611 (Software Measurement)

Concordia University

Department of Computer Science and Software Engineering

Deliverable 1

Students:

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Declaration

We, the members of the team, have read and understood the Fairness Protocol and the Communal Work Protocol, and agree to abide by the policies therein, without any exception, under any circumstances, whatsoever.

Contents

Project Overview

METRICSTICS is all-in-one solution for seamless data analysis, visualization, and reporting. Designed for both beginners and experts, it simplifies statistical calculations, generates insightful reports, and offers robust data visualization tools. From data enthusiasts to researchers and decision-makers, METRICSTICS empowers you to transform data into actionable insights. Administrators can easily configure settings and manage user accounts, making METRICSTICS the ideal companion for data-driven tasks. The purpose of descriptive statistics is to quantitatively describe a collection of data by measures of central tendency, measures of frequency, and measures of variability. It also aims to create a set of interrelated artifacts for conducting certain measurements related to METRICSTICS.

PROBLEM 1

Goal-Question-Metric (GQM)

2.1 SMART Goal

Goal: **Develop a user-friendly interface for METRICSTICS that enhances the accessibility and usability of the system.**

Purpose
To improve the usability and accessibility of METRICSTICS in order to enhance the user experience.

Perspective
Examine user satisfaction and engagement from the viewpoint of the system's end-users.

Environment
In the context of the software development project.

Table 2.1: A Table with 4 Rows and 1 Column

The goal, "Develop a user-friendly interface for METRICSTICS that enhances the accessibility and usability of the system," can be considered SMART because it meets the following criteria:

- **Specific:** The goal is specific and clear in its objective, which is to improve the user interface of METRICSTICS to make it more user-friendly, accessible, and usable.

- **Measurable:** The goal is associated with measurable criteria, such as assessing the usability and accessibility of the interface through user testing and feedback. Metrics like user satisfaction scores, task completion rates, and usability testing results can be used to quantify progress and success.

- **Attainable:** The goal is attainable as it involves the development and improvement of a user interface, which is a practical and feasible task. It does not appear to be overly ambitious or unrealistic.

- **Realistic:** The goal is rationalized because it addresses the need for a user-friendly interface, which is a common requirement for software systems. It is within the scope of what can be expected from a software development project aimed at improving user experience.

- **Timely:** By specifying that the goal can be achieved within a defined period of 2-3 months, it becomes time-bound. This time frame sets a clear expectation of when the user-friendly interface for METRICSTICS should be developed, enhancing the goal's specificity and providing a sense of urgency.

2.2 Questions

10 Questions Related to the Goal (User Interface Development):

1. How can we ensure that the user interface of METRICSTICS is intuitive and easy to navigate?

   - Metric: User Interface Usability Score (measured through usability testing)
   - Metric: Average Time to Perform Common Tasks

2. What are the specific user requirements and preferences for METRICSTICS' interface?

   - Metric: Number of User Interviews Conducted
   - Metric: User Acceptance testing

3. How can we design the interface to accommodate the diverse needs of METRICSTICS users?

   - Metric: Number of User Personas Created

4. What is the expected learning curve for new users of METRICSTICS, and how can we minimize it?

   - Metric: Average Time for New Users to Complete Basic Tasks
   - Metric: Number of Onboarding Tutorials/Help Features Implemented

5. Are there any specific accessibility requirements or guidelines that need to be met in METRICSTICS' interface design?

   - Metric: Number of Accessibility Testing Rounds Conducted

6. How do users perceive the visual aesthetics of METRICSTICS' interface, and does it align with the intended branding and image?

   - Metric: User Interface Design Feedback (gathered through surveys and interviews)
   - Metric: Consistency with Branding Guidelines (measured against a style guide)

7. What is the expected impact of the new interface on user engagement and retention rates within METRICSTICS?

   - Metric: User Engagement Metrics (e.g., active users, session duration)
   - Metric: User Retention Rate Before and After Interface Update

8. How often should we conduct user testing and interface updates to ensure that METRICSTICS remains user-friendly over time?

   - Metric: Frequency of User Testing Sessions
   - Metric: Time Between Interface Updates

9. Are there any critical pain points or bottlenecks in the METRICSTICS interface that need to be addressed in the redesign?

   - Metric: Identified Usability Issues (tracked through user feedback)
   - Metric: Time Spent on Specific Tasks (before and after interface improvements)

10. What are the user expectations regarding cross-platform compatibility, and how can we ensure a consistent experience across devices?

    - Metric: Cross-Platform Testing Results (e.g., responsiveness, compatibility)
    - Metric: User Satisfaction with Interface Consistency

2.3 Metrics to Help Answer Questions

- Usability metrics, including quantitative measures such as task completion rates, user satisfaction scores (quantified through surveys), and error rates, will help objectively assess the usability of the interface.

- User feedback, collected through both qualitative methods like interviews and quantitative methods such as surveys, will provide valuable insights into user requirements, preferences, and pain points.

- Accessibility metrics will not only gauge compliance with accessibility standards but will also quantify the effectiveness of accommodations made for different user needs.

- User engagement and retention metrics will provide quantitative data to evaluate the impact of the interface on user behavior and long-term engagement.

- Design consistency metrics will assess the degree to which the interface aligns with branding guidelines, with quantitative measurements for alignment assessment.

- Frequency of testing and time between updates will help determine the maintenance schedule for the interface.

These metrics collectively provide valuable data to assess the success of the goal related to improving the user interface of METRICSTICS.

PROBLEM 2
Use Case Model

A use case model is a way of representing the functionality of a system or application in terms of the user's goals and tasks. It is a visual representation of the system's behavior that defines the interactions between the system and its users or external systems. A use case model can be visualized using a use case diagram, which shows the actors, use cases, and relationships between them.

Using "Business Executives" and "Database Administrators" as actors in the METRICSTICS use case model provides a clear representation of how the system is used in real-world scenarios. Here's how these roles align with the system:

Actor 1: Business Executives

These users represent individuals in leadership positions within organizations who rely on METRICSTICS to make informed decisions. They might use METRICSTICS to analyze various business metrics, financial data, and market trends.

Actor 2: Database Administrators

In the context of METRICSTICS, database administrators are responsible for managing the system's database infrastructure. They ensure data is securely stored, backed up, and accessible to users. They also handle aspects like database performance tuning and optimization.
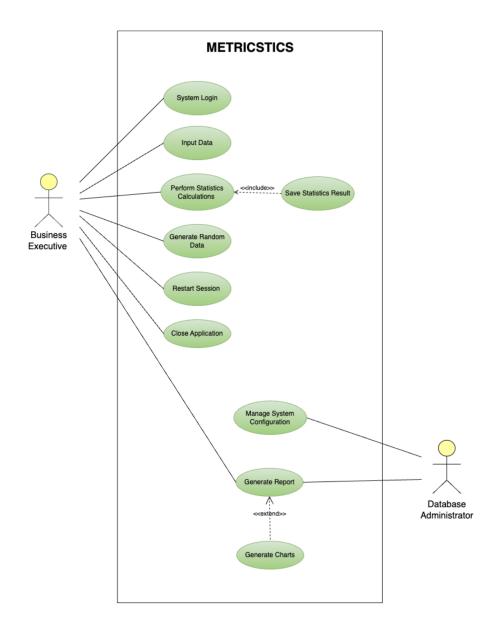
Figure 3.1: METRICSTICS Use Case Model

3.1 Use Case Description

Name	System Login
ID	UC1
Description	The Business Executive logs into the METRICSTICS system by providing their credentials.
Actors	Business Executive
Normal Flow	1. Business Executive provides valid login credentials. 2. The system validates the credentials. 3. The system grants access to the executive's account
Pre-Conditions	Business Executive starts the interaction with the METRICSTICS system.
Post-Conditions	Business Executive successfully logs into their account.
Exceptions	• Business Executive provides invalid login credentials. • The system denies access if the credentials are incorrect.

Table 3.1: System Login Use Case

Name	Input Data
ID	UC2
Description	The Business Executive inputs a dataset into the METRICSTICS system for statistical analysis.
Actors	Business Executive
Normal Flow	1. Business Executive provides a dataset. 2. The system validates and accepts the dataset.
Pre-Conditions	Business Executive has logged into the METRICSTICS system.
Post-Conditions	The dataset is successfully loaded into the system.
Exceptions	• Business Executive provides invalid or incompatible data. • The system rejects the dataset if it doesn't meet the required format or criteria.

Table 3.2: Input Data Use Case

Name	Perform Statistics Calculations
ID	UC3
Description	The Business Executive requests statistical calculations on the input dataset.
Actors	Business Executive
Normal Flow	1. The Business Executive initiates calculations. 2. The system calculates statistical measures.
Pre-Conditions	Business Executive has loaded a valid dataset.
Post-Conditions	The requested statistical calculations are displayed.
Exceptions	• Business Executive requests calculations on an empty dataset. • The system indicates that calculations cannot be performed on an empty dataset.

Table 3.3: Perform Statistics Calculations Use Case

Name	Save Statistics Data
ID	UC4
Description	The Business Executive has the option to save the calculated statistical data for future reference.
Actors	Business Executive
Normal Flow	1. Business Executive selects the option to save statistics data. 2. The system saves the statistical data.
Pre-Conditions	The Business Executive has performed calculations.
Post-Conditions	The statistical data is successfully saved.
Exceptions	The Business Executive chooses not to save the data.

Table 3.4: Save Statistics Data Use Case

Name	Generate Random Data
ID	UC5
Description	The Business Executive can generate a random dataset for testing or analysis purposes.
Actors	Business Executive
Normal Flow	1. The Business Executive specifies parameters for generating random data. 2. The system generates a random dataset.
Pre-Conditions	Business Executive has logged into the METRICSTICS system.
Post-Conditions	A random dataset is generated and made available for use.
Exceptions	Business Executive does not specify parameters, resulting in default random data generation.

Table 3.5: Generate Random Data Use Case

Name	Restart Session
ID	UC6
Description	The Business Executive can restart the session to clear previous data and calculations.
Actors	Business Executive
Normal Flow	1. Business Executive selects the option to restart the session. 2. The system clears all data and calculations.
Pre-Conditions	Business Executive has interacted with the METRICSTICS system.
Post-Conditions	The session is successfully restarted, clearing all previous data.
Exceptions	None specified.

Table 3.6: Restart Session Use Case

Name	Close Application
ID	UC7
Description	The Business Executive can exit or close the METRICSTICS application.
Actors	Business Executive
Normal Flow	1. The Business Executive selects the option to close the application. 2. The system closes the application.
Pre-Conditions	The Business Executive is using the METRICSTICS application.
Post-Conditions	The METRICSTICS application is successfully closed.
Exceptions	None specified.

Table 3.7: Close Application Use Case

Name	Generate Report
ID	UC8
Description	The user creates detailed reports based on the statistical calculations performed on the dataset.
Actors	Business Executive and Database Administrator
Normal Flow	1. User initiates the report generation process. 2. The system generates a report with statistical summaries.
Pre-Conditions	User has performed calculations.
Post-Conditions	A report is generated based on the calculations.
Exceptions	User chooses not to generate a report.

Table 3.8: Generate Report Use Case

Name	Generate Charts
ID	UC9
Description	The user generates visual charts and graphs for data visualization.
Actors	Business Executive and Database Administrator
Normal Flow	1. User initiates the chart generation process. 2. The system generates visual charts based on the dataset.
Pre-Conditions	User has generated Report.
Post-Conditions	Charts and graphs are generated for data visualization.
Exceptions	User chooses not to generate charts.

Table 3.9: Generate Charts Use Case

Name	Manage System Configuration
ID	UC10
Description	The Database Administrator manages system settings and configurations.
Actors	Database Administrator
Normal Flow	Database Administrator configures system settings.
Pre-Conditions	Database Administrator is logged into the METRICSTICS system.
Post-Conditions	System settings are successfully configured.
Exceptions	None specified.

Table 3.10: Manage System Configuration Use Case

3.2 Summary

Use case diagram reflect the interactions and relationships between the actors and use cases in the METRICSTICS system. Here's a summary of the key relationships:

Business Executive Actor:

- Performs various actions like login, data input, calculations, generating random data, session management, closing the application, and generating reports.

- The "Perform Statistics Calculations" use case includes the option to "Save Statistics Result."

- The "Generate Report" use case includes the option to "Generate Chart."

Database Administrator Actor:

- Manages system configuration.

- Can generate reports, and this use case includes the option to "Generate Chart."

Use case diagram provides a clear overview of the functionality and interactions within the system. It's a valuable visual representation that can serve as a foundation for the development and design of the METRICSTICS application.

Roles and Responsibilities for Deliverable 1

Member Name	Deliverable 1	
Varun Aggarwal	Problem 1 : Listing 2 Goal Specific Questions	Problem 2 : Constructing a Use Case Diagram
Merlin Mary Abraham	Problem 1 : Listing 2 Goal Specific Questions	Problem 2 : Constructing a Use Case Diagram
Hadi Ahmad	Problem 1 : Selecting SMART GOAL & Listing 2 Goal Specific Questions	Problem 2 : Writing Description of Use Cases
Alireza Amini	Problem 1 : Listing 2 Goal Specific Questions	Problem 2 : Writing Description of Use Cases
Mohammadreza Amini	Problem 1 : Listing 2 Goal Specific Questions	Problem 2 : LaTeX Documentation

Table 4.1: Roles and Responsibilities

The above table outlines the roles and responsibilities of each member within our team during the project's execution. Our collaborative efforts were facilitated through various communication channels, including Google Meet, WhatsApp chat, Github, and Google Docs. Thanks to the active participation of every team member in project meetings and their commitment to meeting deadlines, we were able to successfully complete our tasks and ensure the project's smooth progress. This synergy and effective communication played a crucial role in our project's success.

REFERENCES

Collaboration Environments

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