



SOEN 6611 (SOFTWARE MEASUREMENT)

CONCORDIA UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

Deliverable 1

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Contents

1	About the Project	3
2	PROBLEM 1	4
2.1	SMART Goal	4
2.2	SMART Principles	4
2.3	Question and Metric	5
3	PROBLEM 2	8
3.1	Use Case Model	8
3.2	Use Case Description	10
4	Collaboration Environments	15
5	References	16

About The Project

In today's data-driven world, effective data interpretation is crucial for informed decision-making. This led to the development of METRICSTICS, our user-centric data analysis tool. METRICSTICS enhances the interpretability of statistical data by providing contextual insights and tailored recommendations. It caters to a diverse user base, from data analysts to those with limited statistical expertise. METRICSTICS simplifies the understanding of statistical findings, empowering users to make informed decisions. We prioritize user engagement, satisfaction, and time efficiency, aiming to build trust in our system's recommendations. Our goal is to foster a data-driven culture where METRICSTICS becomes a trusted ally, bridging data analysis with real-life scenarios, and offering a competitive advantage across industries.

PROBLEM 1

Goal-Question-Metric (GQM)

2.1 SMART Goal

Goal: Enhance the interpretability of statistical data by providing contextual insights and recommendations to users.

2.2 SMART Principles

How we apply SMART Principles to our goal:

- **Specific:** Our Goal specifies what aspects of statistical data need enhancement and also clarifies who the target users are and what kind of insights and recommendations they need.
- **Measurable:** It defines how we will measure the improvement in data interpretability as well as establish quantifiable metrics for user satisfaction or understanding.
- **Achievable:** It considers the available resources and technology needed to provide contextual insights effectively and also ensures that the goal aligns with your organization's capabilities.
- **Relevant:** It verifies that enhancing data interpretability aligns with the organization's broader objectives or mission and also ensures that the goal is relevant to the needs and expectations of the users.
- **Time-bound:** It also sets a specific timeframe for when the improvements in data interpretability should be achieved and also establishes milestones or deadlines for the implementation of contextual insights and recommendations.

2.3 Question and Metric

1. (a) **Question:** How can METRICSTICS use real-life examples and clear explanations to help people understand what the numbers in descriptive statistics really mean?
(b) **Metric:**
 - i. Score of Contextual Integration(c) **Mechanism:**
 - i. It measures the degree to which contextual information is seamlessly integrated with descriptive statistics.
2. (a) **Question:** How good is METRICSTICS at explaining why the numbers in descriptive stats matter to people who don't know much about statistics?
(b) **Metric:**
 - i. Practical Significance Clarity(c) **Mechanism:**
 - i. It assesses the clarity of explanations regarding the practical importance of statistical findings.
3. (a) **Question:** Can METRICSTICS adjust to various user types and customize the real-life explanations it provides? For instance, can it be different for experts and non-experts?
(b) **Metric:**
 - i. Effectiveness of Personalization(c) **Mechanism:**
 - i. Ensuring how well the system can customize insights for different types of users.
4. (a) **Question:** What types of contextual insights are most valuable to users when they are trying to understand descriptive statistics?
(b) **Metric:**
 - i. The Value Perception Index(c) **Mechanism:**
 - i. It checks what users think about how valuable and relevant the real-world explanations are

5. (a) **Question:** How do adding real-life explanations affect the choices people make and how they understand the data?
- (b) **Metric:**
 - i. Decision Impact Metric
- (c) **Mechanism:**
 - i. It measures how frequently users make smart choices because of the real-life explanations they get.
6. (a) **Question:** How well does METRICSTICS help users in identifying potential outliers or unusual data within the dataset based on descriptive statistics?
- (b) **Metric:**
 - i. Outlier Detection Accuracy
- (c) **Mechanism:**
 - i. Measures the system's accuracy in identifying unusual or odd data.
7. (a) **Question:** Are users more satisfied with the interpretability of descriptive statistics when using METRICSTICS compared to traditional analysis methods?
- (b) **Metric:**
 - i. User Satisfaction Index
- (c) **Mechanism:**
 - i. Assesses user satisfaction with METRICSTICS in improving interpretability.
8. (a) **Question::** What factors contribute to onboarding new users and engagement with the contextual insights provided by METRICSTICS?
- (b) **Metric:**
 - i. Engagement Drivers Assessment
- (c) **Mechanism:**
 - i. It assesses key factors influencing user engagement.
9. (a) **Question:** How do the real-life explanations in METRICSTICS affect how quickly people understand and make sense of the descriptive stats?
- (b) **Metric:**

- i. Time Efficiency Metric
 - (c) **Mechanism:**
 - i. Calculates how much time you save by using real-life explanations.
10. (a) **Question:** How much do users believe and depend on METRICSTICS' suggestions and explanations?
- (b) **Metric:**
 - i. Trust and Reliability Score
 - (c) **Mechanism:**
 - i. Measures how much users trust the system's advice and how reliable they find its explanations.

Problem 2

3.1 Use Case Model

A use case model is a visual representation that describes how a system interacts with external entities, known as actors, to accomplish specific tasks. In this model, users and systems act as actors, and their actions are the 'use cases' or specific tasks they want the system to perform. Each use case outlines a particular functionality of the system and details the flow of events, including possible alternative paths and exceptions. Actors can be users, other systems, or even hardware. By creating this model, we can visualize all the possible interactions and exceptions. It's like a user-friendly guide, ensuring that developers and stakeholders have a clear understanding of the system's behavior and functionalities. Integrating 'Data Analyst' and 'Application Manager' roles in METRICSTICS use cases illustrates real-world system utilization:

1: Data Analyst

In METRICSTICS, Data Analysts play a pivotal role as actors. They interact with the system through various use cases such as 'Upload Data,' 'Perform Descriptive Statistics,' and 'Access Contextual Insights.' Data Analysts leverage these functionalities to gain valuable insights from the system's analysis. By uploading data, performing statistical analyses, and accessing contextual insights, Data Analysts contribute to the system's overall functionality.

2: Application Manager

Application Managers in METRICSTICS oversee system operations, monitoring usage, and implementing updates for enhanced functionality, ensuring system effectiveness and relevance.



Figure 3.1: METRICSTICS Use Case Model

3.2 Use Case Description

Use Case ID	UC-1
Use Case Name	Upload Data
Primary Actors	Data Analyst
Priority	High
Description	Data analysts can upload their descriptive statistical data into METRICSTICS for analysis and interpretation.
Pre-Conditions	METRICSTICS is operational and accessible to Data Analysts with permissions and authentication for uploading and prepared descriptive statistical data.
Post-Conditions	Data Analysts have successfully uploaded their descriptive statistical data into METRICSTICS, which stores and makes the uploaded data available for analysis.
Normal Flow	<ul style="list-style-type: none">(a) Data Analyst accesses METRICSTICS.(b) Data Analyst navigates to the data upload section.(c) Data Analyst selects the descriptive statistical data file for uploading.(d) METRICSTICS verifies the data file format and permissions.(e) METRICSTICS uploads and stores the data for analysis.

Table 3.1: Use Case: Upload Data

Use Case ID	UC-2
Use Case Name	Perform Descriptive Statistics
Primary Actors	Data Analyst
Priority	High
Description	Data analysts can perform descriptive statistical analysis on the uploaded data within METRICSTICS to derive insights and recommendations.
Pre-Conditions	METRICSTICS is operational and accessible to Data Analysts who have successfully uploaded descriptive statistical data and possess the necessary permissions and authentication to perform analysis.
Post-Conditions	Data Analysts have obtained descriptive statistics, insights, and recommendations based on the uploaded data.
Normal Flow	<ul style="list-style-type: none">(a) Data Analyst accesses METRICSTICS.(b) Data Analyst selects the uploaded data for analysis.(c) METRICSTICS performs descriptive statistical analysis.(d) Data Analyst reviews the generated insights and recommendations.

Table 3.2: Use Case: Perform Descriptive Statistics

Use Case ID	UC-3
Use Case Name	Access Contextual Insights
Primary Actors	Data Analyst
Priority	High
Description	Data analysts can access contextual insights provided by METRICSTICS to enhance their understanding of the statistical data.
Pre-Conditions	METRICSTICS is operational and accessible to Data Analysts and they have performed descriptive statistical analysis and contextual insights are available based on the analysis.
Post-Conditions	Data Analysts have accessed and gained insights from contextual information.
Normal Flow	<ul style="list-style-type: none"> (a) Data Analyst accesses METRICSTICS. (b) Data Analyst navigates to the contextual insights section. (c) Data Analyst selects the specific insights of interest. (d) METRICSTICS provides contextual insights related to the statistical data.

Table 3.3: Use Case: Access Contextual Insights

Use Case ID	UC-4
Use Case Name	Provide Feedback
Primary Actors	Data Analyst
Priority	Medium
Description	Data analysts provide feedback on the contextual insights and recommendations provided by METRICSTICS, helping improve the system's quality.
Pre-Conditions	Data Analyst has accessed contextual insights and Feedback functionality is available within METRICSTICS.
Post-Conditions	Feedback from Data Analyst is recorded for analysis and potential improvements.
Normal Flow	<ul style="list-style-type: none"> (a) Data Analyst accesses METRICSTICS. (b) Data Analyst reviews contextual insights and recommendations. (c) Data Analyst provides feedback through the designated interface.

Table 3.4: Use Case: Provide Feedback

Use Case ID	UC-5
Use Case Name	Configure Preferences
Primary Actors	Data Analyst
Priority	Medium
Description	Data analysts can configure their preferences within METRICSTICS, indicating specific aspects or types of insights and recommendations they want to receive.
Pre-Conditions	METRICSTICS is operational and accessible to Data Analysts, Data Analyst is logged in and preference configuration options are available within METRICSTICS.
Post-Conditions	Data Analyst's preferences are saved for future interactions with METRICSTICS.
Normal Flow	<ul style="list-style-type: none"> (a) Data Analyst accesses METRICSTICS. (b) Data Analyst navigates to the preferences section. (c) Data Analyst configures their preferences, such as the types of insights they prefer.

Table 3.5: Use Case: Configure Preferences

Use Case ID	UC-6
Use Case Name	Generate Reports
Primary Actors	Data Analyst
Priority	High
Description	Data Analyst can generate reports based on user preferences and data analysis, providing a summary of insights and recommendations.
Pre-Conditions	Data Analyst has access to user preferences and Data analysis has been performed on uploaded data.
Post-Conditions	Generates and presents reports using METRICSTICS.
Normal Flow	<ul style="list-style-type: none"> (a) Data Analyst collects user preferences using METRICSTICS. (b) Data Analyst performs data analysis based on preferences in METRICSTICS. (c) Data Analyst generates reports summarizing insights and recommendations with METRICSTICS. (d) Reports are made available for Data Analysts to access

Table 3.6: Use Case: Generate Reports

Use Case ID	UC-7
Use Case Name	Manage Application
Primary Actors	Application Manager
Priority	High
Description	Application managers can perform various administrative tasks to manage and maintain the METRICSTICS application.
Pre-Conditions	METRICSTICS is operational and accessible to Application Managers and they have the necessary permissions and authentication to manage the application.
Post-Conditions	Application Managers have successfully performed the administrative tasks on METRICSTICS as needed.
Normal Flow	<ul style="list-style-type: none"> (a) Application Manager logs into METRICSTICS. (b) Application Manager navigates to the admin panel or dashboard. (c) Application Manager selects the specific administrative task to be performed. (d) Application Manager makes the necessary changes and updates. (e) METRICSTICS records and applies the changes made by the Application Manager.

Table 3.7: Use Case: Manage Application

Use Case ID	UC-8
Use Case Name	Monitor Usage
Primary Actors	Application Manager
Priority	Medium
Description	Application managers can monitor the usage and performance of METRICSTICS to ensure it operates effectively.
Pre-Conditions	METRICSTICS is operational and accessible to Application Managers and they have the necessary permissions and authentication to monitor usage.
Post-Conditions	Application Managers have successfully monitored and they may take further actions based on usage data.
Normal Flow	<ul style="list-style-type: none"> (a) Application Manager logs into METRICSTICS. (b) Application Manager navigates to the usage monitoring section. (c) Application Manager reviews usage statistics, including system resource utilization, user activity, and performance metric. (d) Application Manager identifies any anomalies or areas of concern. (e) Application Manager may initiate corrective actions or optimizations as needed.

Table 3.8: Use Case: Monitor Usage

Use Case ID	UC-9
Use Case Name	Update Application
Primary Actors	Application Manager
Priority	High
Description	Application managers can update and maintain the application, including applying patches and enhancements.
Pre-Conditions	METRICSTICS is operational and accessible to Application Managers with the necessary permissions and authentication to update the application, and updates or enhancements are available for METRICSTICS.
Post-Conditions	METRICSTICS has been successfully updated with the latest patches or enhancements and Application Managers have verified that the application is running smoothly post-update.
Normal Flow	<ul style="list-style-type: none"> (a) Application Manager logs into METRICSTICS. (b) Application Manager navigates to the update and maintenance section. (c) Application Manager checks for available updates or enhancements. (d) Application Manager selects the updates to be applied and schedules the update process. (e) METRICSTICS goes into maintenance mode during the update. (f) Application Manager monitors the update process for any issues or errors. (g) Once the update is complete, METRICSTICS is brought back to normal operation.

Table 3.9: Use Case: Update Application

Collaboration Environments

- (a) **Github** : <https://github.com/sehgaldeepanshu985/SOEN-6611---METRICSTICS>
- (b) **Drive** : https://drive.google.com/drive/folders/1t1vBtglbnQJ0IHLDo4drive_link
- (c) **Roles and Responsibilities**: https://drive.google.com/file/d/1pCrtJ3k-rT8Iic0ehQuyQqBrI_5rKCeQ/view?usp=drive_link

References

References

- (a) <https://www.atlassian.com/blog/productivity/how-to-write-smart-goals#:~:text=The%20SMART%20in%20SMART%20goals,within%20a%20certain%20time%20frame.>
- (b) <https://sparxsystems.com/resources/tutorials/uml/use-case-model.html#:~:text=A%20Use%20Case%20Model%20describes,Account%20or%20View%20Account%20Details.>
- (c) <https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-use-case-diagram/>
- (d) **Lecture notes by Prof. Pankaj Kamthan**