Software Requirements Specification for Software Engineering: subtitle describing software

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Revision History

Date	Version	Notes
Date 1	1.0	Notes
Date 2	1.1	Notes

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Insert your content here.

8.3 Individual Product Use Cases (PUC's)

Insert your content here.

9 Functional Requirements

9.1 Data Input Requirements

FR-1. The system shall allow the user to input new experiment data or parameters.

- *Rationale:* The system needs to be kept up-to-date with ongoing experiments, which may include new parameters that did not exist previously.
- *Fit Criterion:* The user should be able to input new data and parameters with 0 errors.

FR-2. The system shall store experiment data in the database with all associated parameters and values correctly labelled.

- *Rationale:* Ensures that data retrieval and analysis will be correct and accurate.
- *Fit Criterion:* The system database parameters and values shall match the original experiment data parameters and values.

9.2 Data Migration and Organization Requirements

FR-3. The system shall read existing experiment data stored in .CSV files.

- *Rationale:* Existing experiment data is stored in Excel spreadsheets and must be integrated into the new system for continuity and analysis.
- *Fit Criterion:* The system shall read and import the data files with 0 errors.

FR-4. The system shall organize experiment data by timestamps and experiment ID for unique identification.

- *Rationale:* Each experiment needs to be separately identified for quick retrieval of data and efficiency in search or query actions.
- *Fit Criterion:* Each ID and timestamp shall be traceable to one experiment.

9.3 Data Search and Query Requirements

FR-5. The system shall allow the user to search for specific datasets based on different parameters.

- *Rationale:* Allows for quick look-ups of certain experiments and their results.

- *Fit Criterion:* The system shall retrieve the correct experiments based on the matching parameters.

FR-6. The system shall allow the user to query two or more parameters or datasets for comparison and analysis.

- *Rationale:* Allows for direct comparisons between different experiment parameters and/or results, which is necessary for analysis.
- *Fit Criterion:* The system shall retrieve the correct parameters and/or experiments based on the query inputs.

FR-7. The system shall display the results of a user's selected search or query in a format that is readable to the user.

- *Rationale:* The user needs to see the results in a format that they can interpret.
- *Fit Criterion:* The results shall be displayed in a table with all labels correct and legible.

9.4 Data Visualization Requirements

FR-8. The system shall generate visual graphs based on selected parameters and datasets.

- *Rationale:* Visual representation of the data allows for easy interpretation and graphical analysis.
- *Fit Criterion:* The result should display a graphical plot with a title, axes, labels, and a legend.

FR-9. The system shall allow the user to customize the data visualization by adjusting axes, data ranges, labels, etc.

- *Rationale:* Allows the user to adjust the graphical representation to their needs for their analysis.
- *Fit Criterion:* Modifications to axes, data ranges, labels should be reflected in the generated graph in real-time.

9.5 Data Analysis Requirements

FR-10. The system shall analyze patterns and trends in the experiment data based on the user's selected parameters.

- *Rationale:* Trend analysis is critical for the user to discover important findings pertaining to the experiment.
- *Fit Criterion:* The system shall generate a result of the analysis to display to the user.

FR-11. The system shall use machine learning algorithms to predict and interpolate the data.

- *Rationale:* Allows for future predictions of data and efficiency in running future experiments.
- *Fit Criterion:* The system shall generate a report of value predictions or interpolate a graph and provide the interpolated data points.

9.6 Error Tracking Requirements

This section outlines functional requirements for one of the project's stretch goals.

FR-12. The system shall track and log errors in the experiment data.

- *Rationale:* Helps users identify irrelevant or missing parameters.
- *Fit Criterion:* Missing values from input data should be flagged.

FR-13. The system shall remove data logged as errors.

- *Rationale:* Ensures data is organized and produce accurate results in analysis.
- *Fit Criterion:* Flagged data should be removed from the database after user confirmation.

9.7 User Access Management Requirements

This section outlines functional requirements for one of the project's stretch goals.

FR-14. The system shall allow the user to sign in with valid credentials.

- *Rationale:* Ensures the data can only be accessed and modified by authorized users.
- *Fit Criterion:* The user shall be able to log in with a username and password.

9.8 Data Export Requirements

This section outlines functional requirements for one of the project's stretch goals.

FR-15. The system shall generate a report of queries in a session for the user to save or download.

- *Rationale:* Allows user to keep a record of their findings for future use or reference.
- *Fit Criterion:* The report should be exported in CSV or PDF format.

10 Look and Feel Requirements

10.1 Appearance Requirements

Insert your content here.

10.2 Style Requirements

Insert your content here.

11 Usability and Humanity Requirements

11.1 Ease of Use Requirements

Insert your content here.

11.2 Personalization and Internationalization Requirements

Insert your content here.

11.3 Learning Requirements

Insert your content here.

11.4 Understandability and Politeness Requirements

Insert your content here.

11.5 Accessibility Requirements

Insert your content here.

12 Performance Requirements

12.1 Speed and Latency Requirements

1. The system shall store new data or parameters within 60 seconds of input.
2. The system shall retrieve data from the database within 50ms for typical search and queries.
3. The interaction between the interface and the user shall have a maximum response time of 2 seconds.
4. The system shall have a maximum latency of 2 seconds for typical search and queries.
5. The system shall generate a visualization of the data within 5 seconds.

12.2 Safety-Critical Requirements

The product does not have safety-critical requirements to consider.

12.3 Precision or Accuracy Requirements

1. All parameter values shall be accurate to four decimal places.
2. All timestamps of experiment data shall be accurate to milliseconds.
3. Values on visual data plots shall be accurate to four decimal places.

12.4 Robustness or Fault-Tolerance Requirements

1. The application shall not terminate but display an error message if it loses connection to the backend server.
2. The application shall provide basic functionality if it loses connection to the internet.

12.5 Capacity Requirements

1. The application shall allow for up to three simultaneous users.
2. The system shall store up to x amount of data.

12.6 Scalability or Extensibility Requirements

1. The system shall be able to process and store the existing data. The amount of data going into the system is expected to grow until the experiment study comes to an end.
2. The system shall be able to add additional parameters that did not previously exist in the database at the discretion of the user.

12.7 Longevity Requirements

1. The system shall operate for the duration of the experiment study.

13 Operational and Environmental Requirements

13.1 Expected Physical Environment

1. The system shall operate in a typical office environment with internet connectivity.
2. The system shall be compatible with a desktop and laptop environment.

13.2 Wider Environment Requirements

Insert your content here.

13.3 Requirements for Interfacing with Adjacent Systems

1. The system shall operate on the most recent versions of Google Chrome and Apple Safari.

13.4 Productization Requirements

1. The system shall be distributed as a web application.
2. The system shall have an easy onboarding process with user documentation.

13.5 Release Requirements

1. The first version of the system shall be released once project completion is reached.

14 Maintainability and Support Requirements

14.1 Maintenance Requirements

Insert your content here.

14.2 Supportability Requirements

Insert your content here.

14.3 Adaptability Requirements

Insert your content here.

15 Security Requirements

15.1 Access Requirements

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15.2 Integrity Requirements

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15.3 Privacy Requirements

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15.4 Audit Requirements

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16 Cultural Requirements

16.1 Cultural Requirements

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17 Compliance Requirements

17.1 Legal Requirements

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18 Open Issues

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19 Off-the-Shelf Solutions

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Insert your content here.

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20.1 Effects on the Current Environment

Insert your content here.

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Insert your content here.

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Insert your content here.

20.4 Limitations in the Anticipated Implementation Environment That May Inhibit the New Product

Insert your content here.

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22.1 Requirements for Migration to the New Product

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Insert your content here.

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25 Waiting Room

Insert your content here.

26 Ideas for Solution

Insert your content here.

Appendix — Reflection

The information in this section will be used to evaluate the team members on the graduate attribute of Lifelong Learning. Please answer the following questions:

1. What knowledge and skills will the team collectively need to acquire to successfully complete this capstone project? Examples of possible knowledge to acquire include domain specific knowledge from the domain of your application, or software engineering knowledge, mechatronics knowledge or computer science knowledge. Skills may be related to technology, or writing, or presentation, or team management, etc. You should look to identify at least one item for each team member.

2. For each of the knowledge areas and skills identified in the previous question, what are at least two approaches to acquiring the knowledge or mastering the skill? Of the identified approaches, which will each team member pursue, and why did they make this choice?