

Deliverable #1 Template : Software Requirement Specification (SRS)

SE 3A04: Software Design II – Large System Design

Tutorial Number: T03

Group Number: G8

Group Members: Hashim Bukhtiar, Jaden Moore, James Ariache, Olivia Reich, Omar Abdelhamid

- Group Member Name (as listed in Avenue)
- You do not need to use student #s or macid (keep those private).

IMPORTANT NOTES

- Be sure to include all sections of the template in your document regardless whether you have something to write for each or not
 - If you do not have anything to write in a section, indicate this by the *N/A*, *void*, *none*, etc.
- Uniquely number each of your requirements for easy identification and cross-referencing
- Highlight terms that are defined in Section 1.3 (**Definitions, Acronyms, and Abbreviations**) with **bold**, *italic* or underline
- For Deliverable 1, please highlight, in some fashion, all (you may have more than one) creative and innovative features. Your creative and innovative features will generally be described in Section 2.2 (**Product Functions**), but it will depend on the type of creative or innovative features you are including.

1 Introduction

The SRS is a structured document that outlines the functional and non-functional requirements of the RideRecon software system. It serves as a blueprint for developers, testers, and stakeholders, ensuring a clear understanding of the system to be built. This SRS will provide visibility over software requirements for RideRecon, a taxi rideshare application. This document will discuss the purpose of RideRecon, the scope of the application, user characteristics, product requirements, and use case diagrams.

1.1 Purpose

The document focuses on software requirements, user characteristics, and use cases for RideRecon. The purpose of this SRS is to define the software's objectives, scope, and functionalities. This document is intended for internal RideRecon stakeholders, including but not limited to, project managers, developers, domain experts, and RideRecon team members/investors. No prior readings are required.

1.2 Scope

RideRecon, the car identification application, will allow users to upload an image and text about a vehicle that they want to identify, consulting up to four "Experts" who will use all or some of the user's input to determine the make and model of the car that has been depicted.

Users are required to register an account on RideRecon in order to access the car identification service. The service includes four experts: "RIS", "G8M", "4oE" and "vAI". The "RIS" expert performs a reverse image search with the user's given image to identify the car. The "G8M" expert is a trained machine learning model by the developers that utilizes an optimized database of car images and their corresponding makes and models to identify the user's car. The "4oE" expert is the Large Language Model GPT-4o-mini, accessed through OpenAI's API, which will utilize both the image and the text description to identify the car. Finally, the "vAI" expert is also an LLM, this one hosted on Google Cloud Platform using Vertex AI, specifically the Gemini 1.0 Flash Model, also accessed through its API.

RideRecon's objective is not only to identify users' vehicles, but also to deliver other innovative and creative features. For example, once the car has been identified, 4oE will provide an interesting fact about the car, adding more depth and intrigue to it, as well as provide sources and listings for where to purchase the car, allowing the user to go one step further and save time if they are interested in making that vehicle their own.

One of the goals of the software is to increase users, as more users will lead to more cars being identified and added to the optimized database of G8M, and thus better car identification overall, which is even better for future users. Another goal would be to monetize its user base by offering premium features like better expert access, exclusive community forums, or partnerships with car-related businesses, thereby creating additional revenue streams beyond the core car identification service. This diversification will improve long-term sustainability and profitability.

1.3 Definitions, Acronyms, and Abbreviations

LLM: Large Language Model. A sophisticated artificial intelligence that can understand, generate, and translate human language, often used for tasks like text generation, question answering, and translation.

RIS: Reverse Image Search. This is the idea of using an image as a search query in a browser to find results, rather than using text as traditional browser searches as performed.

G8M: Group 8 Model. This is the model trained by the developers of RideRecon to identify cars. It will utilize an optimized dataset of car images and makes and models.

4oE: GPT-4o-mini. This is an LLM that uses text and images to determine the make and model of the user's car.

vAI: Vertex AI, Gemini 1.0 Flash. This is the LLM that uses images to determine the make and model of the user's car.

1.4 References

- Provide a complete list of all documents referenced elsewhere in the SRS.
- Identify each document by title, report number (if applicable), date, and publishing organization.
- Specify the sources from which the references can be obtained.
- Order this list in some sensible manner (alphabetical by author, or something else that makes more sense).

1.5 Overview

Section 2 discusses the overall product description talking about the product perspective, product functions, user characteristics, assumptions and dependencies, and apportioning of requirements.

Section 3 contains the Use Case Diagram for the use case scenario of creating a carpool.

Section 4 contains the highlights of functional requirements talking about main business events and view-points.

Section 5 contains the Non-Functional Requirements talking about Look and Feel Requirements, Usability and Humanity Requirements, Performance Requirements, Operational and Environmental Requirements, Maintainability and Support Requirements, Security Requirements, Cultural and Political Requirements and Legal Requirements.

Lastly, **Section A** contains the Division of Labour.

2 Overall Product Description

- This section should describe the general factors that affect the product and its requirements.
- It does not state specific requirements.
- It provides a *background* for those requirements and makes them easier to understand.

2.1 Product Perspective

- Put the product into perspective with other related products, i.e., context
- If the product is independent and totally self-contained, it should be stated here
- If the SRS defines a product that is a component of a larger system, then this subsection should relate the requirements of that larger system to the functionality of the software being developed. Identify interfaces between that larger system and the software to be developed.
- A block diagram showing the major components of the larger system, interconnections, and external interfaces can be helpful

2.2 Product Functions

- Provide a *summary* of the major functions that the software will perform.
 - **Example:** An SRS for an accounting program may use this part to address customer account maintenance, customer statement, and invoice preparation without mentioning the vast amount of detail that each of those functions requires.
- Functions should be organized in a way that makes the list of functions understandable to the customer or to anyone else reading the document for the first time
- Present the functions in a list format - each item should be one function, with a brief description of it

- Textual or graphical methods can be used to show the different functions and their relationships
 - Such a diagram is not intended to show a design of a product, but simply shows the logical relationships among variables

2.3 User Characteristics

- Describe those general characteristics of the intended users of the product including educational level, experience, and technical expertise
- Since there will be many users, you may wish to divide into different user types or personas

2.4 Constraints

- Provide a general description of any constraints that will limit the developer's options

2.5 Assumptions and Dependencies

- List any assumptions you made in interpreting what the software being developed is aiming to achieve
- List any other assumptions you made that, if it fails to hold, could require you to change the requirements
 - **Example:** An assumption may be that a specific operating system will be available on the hardware designated for the software product. If, in fact, the operating system is not available, the SRS would then have to change accordingly.

2.6 Apportioning of Requirements

- Identify requirements that may be delayed until future versions of the system

3 Use Case Diagram

- Provide the use case diagram for the system being developed.
- You do not need to provide the textual description of any of the use cases here (these will be specified under "Highlights of Functional Requirements").

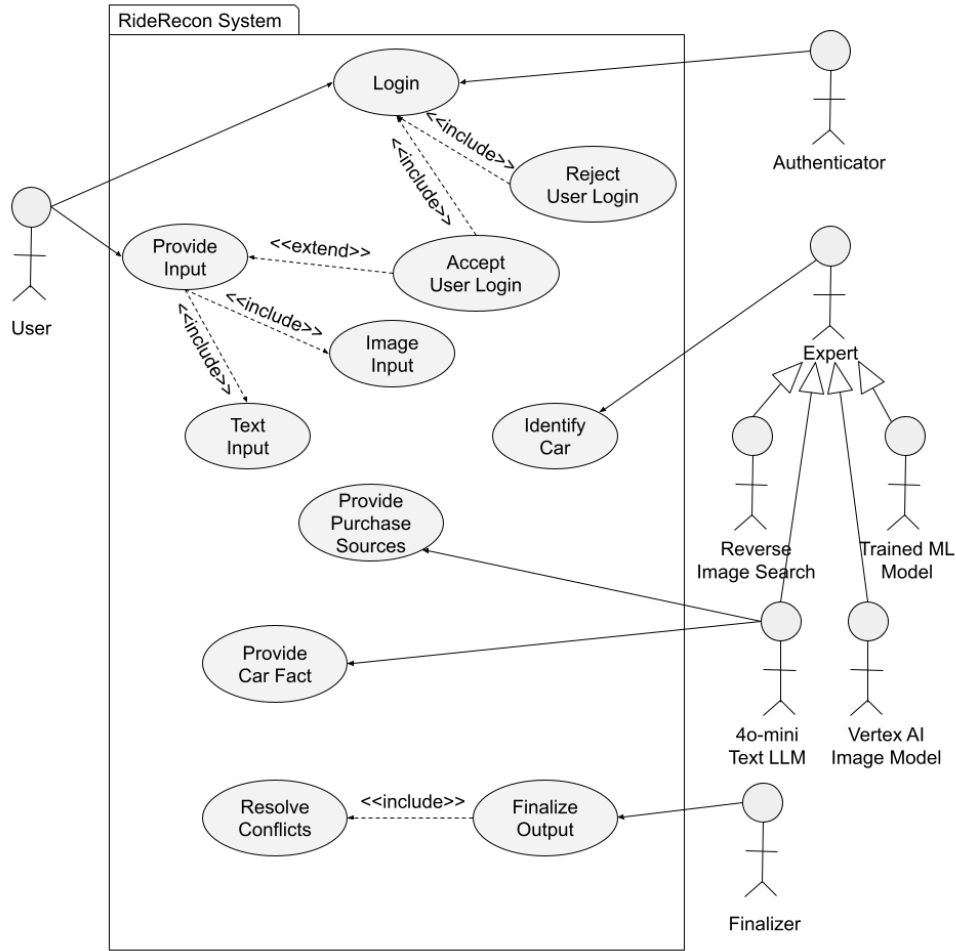


Figure X. Use Case Diagram

4 Highlights of Functional Requirements

- Specify all use cases (or other scenarios triggered by other events), organized by Business Event.
- For each Business Event, show the scenario from every Viewpoint. You should have the same set of Viewpoints across all Business Events. If a Viewpoint doesn't participate, write N/A so we know you considered it still. You can choose how to present this - keep in mind it should be easy to follow.
- At the end, combine them all into a Global Scenario.
- Your focus should be on what the system needs to do, not how to do it. Specify it in enough detail that it clearly specifies what needs to be accomplished, but not so detailed that you start programming or making design decisions.
- Keep the length of each use case (Global Scenario) manageable. If it's getting too long, split into sub-cases.
- You are *not* specifying a complete and consistent set of functional requirements here. (i.e. you are providing them in the form of use cases/global scenarios, not a refined list). For the purpose of this project, you do not need to reduce them to a list; the global scenarios format is all you need.
- Red text below is just to highlight where you need to insert a scenario - don't actually write it all in red.

Main Business Events: List out all the main business events you are presenting. If you sub-divided into smaller ones, you don't need to include the smaller ones in this list.

Viewpoints: List out all the viewpoints you will be considering.

Interpretation: Specify any liberties you took in interpreting business events, if necessary.

BE1. Business Event Name #1

VP1. Viewpoint Name #1

Insert Scenario Here

VP2. Viewpoint Name #2

Insert Scenario Here

Global Scenario:

Insert Scenario Here

BE2. Business Event Name #2

VP1. Viewpoint Name #1

Insert Scenario Here

VP2. Viewpoint Name #2

Insert Scenario Here

Global Scenario:

Insert Scenario Here

5 Non-Functional Requirements

- For each non-functional requirement, provide a justification/rationale for it.

Example:

SC1. *The device should not explode in a customer's pocket.*

Rationale: Other companies have had issues with the batteries they used in their phones randomly exploding [insert citation]. This causes a safety issue, as the phone is often carried in a person's hand or pocket.

- If you need to make a guess because you couldn't really talk to stakeholders, you can say "We imagined stakeholders would want...because..."
- Each requirement should have a unique label/number for it.
- In the list below, if a particular section doesn't apply, just write N/A so we know you considered it.

5.1 Look and Feel Requirements

5.1.1 Appearance Requirements

LF-A1.

5.1.2 Style Requirements

LF-S1.

5.2 Usability and Humanity Requirements

5.2.1 Ease of Use Requirements

UH-EOU1.

5.2.2 Personalization and Internationalization Requirements

UH-PI1.

5.2.3 Learning Requirements

UH-L1.

5.2.4 Understandability and Politeness Requirements

UH-UP1.

5.2.5 Accessibility Requirements

UH-A1.

5.3 Performance Requirements

5.3.1 Speed and Latency Requirements

PR-SL1.

5.3.2 Safety-Critical Requirements

PR-SC1.

5.3.3 Precision or Accuracy Requirements

PR-PA1.

5.3.4 Reliability and Availability Requirements

PR-RA1.

5.3.5 Robustness or Fault-Tolerance Requirements

PR-RFT1.

5.3.6 Capacity Requirements

PR-C1.

5.3.7 Scalability or Extensibility Requirements

PR-SE1.

5.3.8 Longevity Requirements

PR-L1.

5.4 Operational and Environmental Requirements

5.4.1 Expected Physical Environment

OE-EPE1.

5.4.2 Requirements for Interfacing with Adjacent Systems

OE-IA1.

5.4.3 Productization Requirements

OE-P1.

5.4.4 Release Requirements

OE-R1.

5.5 Maintainability and Support Requirements

5.5.1 Maintenance Requirements

MS-M1.

5.5.2 Supportability Requirements

MS-S1.

5.5.3 Adaptability Requirements

MS-A1.

5.6 Security Requirements

5.6.1 Access Requirements

SR-AC1.

5.6.2 Integrity Requirements

SR-INT1.

5.6.3 Privacy Requirements

SR-P1.

5.6.4 Audit Requirements

SR-AU1.

5.6.5 Immunity Requirements

SR-IM1.

5.7 Cultural and Political Requirements

5.7.1 Cultural Requirements

CP-C1.

5.7.2 Political Requirements

CP-P1.

5.8 Legal Requirements

5.8.1 Compliance Requirements

LR-COMP1.

5.8.2 Standards Requirements

LR-STD1.

A Division of Labour

Include a Division of Labour sheet which indicates the contributions of each team member. This sheet must be signed by all team members.





Hashim Bukhtiar	Jaden Moore	James Ariache	Olivia Reich	Omar Abdelhamid
1.1, 1.2, 1.3, 1.4, 1.5 Section 3 BE1 in Section 4	5.3, 5.4, 5.5, 5.8 BE2 in Section 4	5.1, 5.2, 5.6, 5.7 BE3 in Section 4	2.1, 2.2, 2.3 BE4 in Section 4	2.4, 2.5, 2.6 BE5 in Section 4
				SIGNATURE

Table 1: Division of Labour