Software Requirements Specification

for

EurekaEats

Version 1.0.0 approved

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1. Introduction

The software requirement specification(SRS) is a document that describes what the software will do and how it will be expected to perform. The main audience for the SRS are developers, testers, and project managers..

1.1 Purpose

The purpose of this document is to plan and decide what specifications will be included in the document. The software engineers involved in this project will better understand the requirements, the breakdown of the project, and individual software related to this project.

1.2 Intended Audience and Reading Suggestions

This document is intended for developers and testers to understand the requirements and purpose of the EurekaEats web application. Sections one and two give an overview of the project, sections three to five are specific functional requirements, and section 6 covers other concerns within the scope of this document. The developers should be familiar with the entirety of this document. Software testers should be familiar with the first four sections.

1.3 Product Scope

Software Product: EurekaEats

This software is a website that combines the specific food preferences of a user and finds a local, best-fit restaurant by those factors. Website users can write reviews, rate reviews, and find restaurants. The benefit of the software after release consists of a new foodie base community. The main use of EurekaEats website by any user is to select the best dining location for themselves rigorously. Another primary use of the product by any user is to assist other users in choosing optimal dining locations through reviews.

1.4 Definitions, Acronyms, and Abbreviations

TBD means “to be determined”.

1.5 References

- Software Requirements Specification document with example - Krazytech
- Server Size Guidelines – Logi Analytics

2. Overall Description

The website will allow users to create a profile, search for restaurants, and leave reviews. The search will be able to find restaurants for users based on their eating preferences.

2.1 System Analysis

The most important goals of the project are to offer a more fitting service to find and select the best restaurants for any user and to serve as an informal reference to inform users on which restaurants are most desirable or not.

The technical hurdles of this project include designing an algorithm to find the best restaurant within constraints, creating a database schema, and creating a user-friendly, accessible UI.

Our software development team will research and design a UI, database schema, and have multiple coding reviews to fit the requirement.

2.2 Product Perspective

EurekaEats is comparable to Yelp. EurekaEats is different from Yelp in that users are able to define more specific eating requirements when searching for restaurants.

User's information:

User information includes the user's eating preferences(cuisine, vegan, protein, keto, allergies, and more). This information is used to find a restaurant for the user.

Restaurant information:

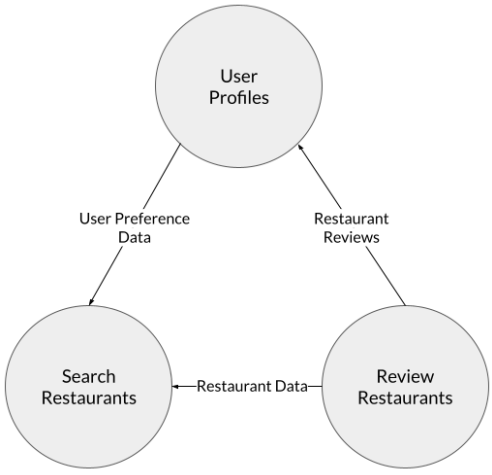
Restaurant information includes restaurant address, type of cuisine, price range, ambiance, Wi-Fi accessibility, and more). This information is used for users to see what type of restaurant it is.

? DIAGRAM HERE ?

2.3 Product Functions

Users should have the ability to use these functions on our website.

- User Profiles - Users can create an account where their eating preferences, restaurant reviews, and favorites will be saved.
- Search Restaurants - Users can search for restaurants based on the preferences voluntarily submitted to their profile.
- Review Restaurants - Users can review a restaurant on the website to let other users be more aware of the foods they serve and the level of service.



2.4 User Classes and Characteristics

- Restaurant Owner - Wants to claim their restaurant and list their food
- Power Reviewer (foodie type/yelp critic) - Reviews restaurants often.

- Casual User - Mostly searches for restaurants and sometimes may review them.

2.5 Operating Environment

The technologies used on this platform will be platform-independent. Specifically, any desktop or server-oriented operating system should be able to run high-level program languages that are already independent of any hardware or OS..

2.6 Design and Implementation Constraints

Items that can influence the ability of the software developers to implement the product would be system overloading due to the amount of users using the website.

Give a general description of any items that will influence the ability of the software developers to implement the product. These can include things such as:

- Interfaces with other applications
    - The website will use 3rd party APIs such as the Yelp API for restaurant data and the Google Maps API for location data.
- Reliability requirements:
    - The software must be reliable in performance and uptime. Page operations should take at most 3 seconds, and the website runs should not crash more than 10% of the time.
- Safety and Security Considerations:
    - Since user-inputted data is unverified, the application must validate it based on the data format, the accepted data values, and the message format. For formatting, poorly formatted messages and data sent to or from the website could cause errors or crashes if not handled. Also, validating data for appropriate values ensures that the data fits realistic constraints: star ratings cannot be negative, etc.
    - Since passwords are crucial for users to access their profiles, storing them as plain text will allow any database breach to expose sensitive data. If attackers somehow access the database and steal passwords, they could hijack user accounts or expose their personal information. Thus, we will consider using string hashes to protect passwords.
- Memory Constraints
    - Other programs may be running on test machines for *localhost* software versions, so the software must not take excessive RAM. A possible constraint can be that the software should not have an out-of-memory error.

2.7 User Documentation

TBD

2.8 Assumptions and Dependencies

The cost of API calls can change and free products can become unavailable. If a service we use (such as Google Places) changes pricing, we may need to change our strategy.

3. External Interface Requirements

3.1 User Interfaces

Front-End Interface: JavaScript

- Splash Screen with gradient and logo of EurekaEats that directs to Login
- Login page that takes either email/password or OTP with phone number
    - If the user has not logged in before, navigate to the sign-in page

- Navigation bar that allows users to move from the home page to other screens (Bottom tab or Left-hand side drawer)
    - Including both labels and icons describing each screen, menu-like structure
    - Screens include: Splash, Login, Sign Up, Settings, Home, Favorites, List of Restaurants that fit criteria (accessible via the search bar on the home page), Individual Restaurant clicked from the List
- Search bar function that allows users to search for restaurants that fit their criteria
    - Users will search via the following criteria: Price, ambiance, location, meat options, cuisine type
- Like/Favorite button on each restaurant to allow users to save favorites
    - Starts with an outline of a heart and then fills into red when clicked
    - The separate screen that is accessible via a navigation bar shows users their favorited options
- Help Button on the Home page that allows users to learn about EurekaEats and how to use its functionality
- Share Button on Individual restaurants and Restaurant list screens
- Rating feature of each restaurant (could be hardcoded through the app and saved on the database or through Google Places rating feature)
- Error messages appear during sign-up/login when email/phone number (and other personal information) is not properly entered, in red text
- Settings page with log-out and edit personal information buttons and functionalities
    - Logout button, Delete Account Button, Change profile picture, change password
- User Feedback Mechanisms: Loading icon between screens to indicate their request has been recorded by the system and the system is pulling their requested data,
- Americans with Disabilities Act: Adding alternative texts for images from restaurants, keyboard navigation support (users can access all the features via keyboard), proper contrast between text and background with colors, resizable text

Back-End Software: MongoDB

- Restaurant collection
    - id (long number or UUID string)
    - name (string of location name)
    - address (string: neighborhood, string: street, string: building #.)
    - cuisine type (string: ethnic culture name such as Italian, Japanese, etc.)
    - price (double: average price of dishes?)
    - Ratings
        - list of objects: (each entry has user_id and an integer rating from 1-5)
        - reviewers (user_id list for any review authors rather than duplicate review data in 2 places)
- User collection
    - user_id (long number or UUID string)
    - username (must be unique)
    - passhash (hashed by BCRYPT or other string hashing algorithms)
    - home_location (object with GPS coordinates… must be kept private and secure)
    - eating requirements
        - meat amount (integer: 0 - 2 for none, some, or heavy respectively)
        - price (double: average price of dishes?)
        - cuisine ethnicity (string: ethnic culture name such as Italian, Japanese, etc.)
        - Reviews
            - count: integer
            - data: object of (restaurant_id, restaurant_name, star_rating, comment)

3.2 Hardware Interfaces

This software does not have hardware interface requirements.

3.3 Software Interfaces

- Browsers & Versions
    - Chrome V117.0
        - https://www.google.com/chrome/
    - Firefox V118.0

        - https://www.mozilla.org/en-US/firefox/new/
- APIs
    - Yelp Fusion (?)
        - https://fusion.yelp.com/
    - Google Places (?)
        - https://developers.google.com/maps/documentation/places/web-service/overview
- Database:
    - MongoDB 7.0
        - https://www.mongodb.com/try/download/community-edition
- Programming Languages:
    - Python 3.12
        - https://www.python.org/downloads/release/python-3120/?ref=upstract.com
        - Replaced our original choice of Java by group consent.
    - Javascript: ES6
        - TBD

3.4 Communications Interfaces

Network protocols:

- Application: HTTP/1.1 (common on local test servers)
- Transport: TCP (almost everywhere) & IP addressing (everywhere)

Application Message Data:

- Format: JSON text
- App Operations: (for communication between server program and page scripts)
    - `{ "action_code": number, "args": <array of anything>}`
- App Data: (may be in args field)
    - `{ "payload_type": string, "data": <object | array>}`

4. Requirements Specification

This section contains all of the necessary software requirements with enough detail to allow designers to accurately design the software to satisfy those requirements, and to allow testers of the software to verify that all requirements have been satisfied. The requirements should include a description of every input to the system, every output, and all functions performed by the system in response to an input or output.

The biggest thing to remember is that this section is for the software developers (technical people) while the previous sections were for the customers / non-technical people.

Also remember that this is not HOW things will be implemented, but WHAT will be implemented.

Requirements should be written according to the following:

- Specific requirements should be correct, unambiguous, complete, consistent, ranked for importance and / or stability, verifiable, modifiable, and traceable.
- Specific requirements should be cross-referenced to earlier documents that are relevant.
- All requirements should be uniquely identifiable using a consistent numbering system, i.e. 1.1, 1.2, 1.1.2, and so on.
- Requirements should be organized in a logical manner to provide the most readability.

Use the following format for each requirement:

- The system shall... (this means this requirement is mandatory).
- The system should... (this means a desired feature, but may be delayed until later).
- This system may... (A optional, nice-to-have feature that might not be implemented).

Remember to number each requirement for traceability. Use a system such as 1.1, 1.1.1, 1.1.2.1, and so on. Each requirement need to be testable. Avoid statements that are general and vague such as "The system shall be easy to use." or "The system shall be developed using good software engineering practices."

Do not include examples. Remember that this is a specification and the designer should be able to read this and build the system without having to bother the customer again. Every minute detail must be documented here.

EVERYTHING in section 4 must be written following the above guidelines.

4.1 Functional Requirements

Functional requirements define the fundamental actions that must take place in the software in accepting and processing the inputs and in processing and generating the outputs. These are generally listed as “shall” statements starting with "The system shall…”

These include:

- Validity checks on the inputs
- Exact sequence of operations
- Responses to abnormal situation, including
    - Overflow
    - Communication facilities
    - Error handling and recovery
- Effect of parameters
- Relationship of outputs to inputs, including
    - Input/Output sequences
    - Formulas for input to output conversion

It may be appropriate to partition the functional requirements into sub-functions or sub-processes. This does not imply that the software design will also be partitioned that way.

This section should be as detailed as possible, again, listing WHAT your software is going to do, not HOW you are going to accomplish it.

4.2 External Interface Requirements

This contains a detailed description of all inputs into and outputs from the software system. It complements the interface descriptions in section 3 but does not repeat information there. Remember section 3 presents information oriented to the customer/user while section 4 is oriented to the developer.

It contains both content and format as follows:

- Name of item
- Description of purpose
- Source of input or destination of output
- Valid range, accuracy and/or tolerance
- Units of measure
- Timing
- Relationships to other inputs/outputs
- Screen formats/organization
- Window formats/organization
- Data formats
- Command formats
- End messages

4.3 Logical Database Requirements

This section specifies the logical requirements for any information that is to be placed into a database.

This may include:

- Types of information used by various functions
- Frequency of use
- Accessing capabilities
- Data entities and their relationships
- Integrity constraints
- Data retention requirements

If the customer provided you with data models, those can be presented here. ER diagrams (or static class diagrams) can be useful here to show complex data relationships. Remember a diagram is worth a thousand words of confusing text.

4.4 Design Constraints

Specify design constraints that can be imposed by other standards, hardware limitations, etc. This should be a more technical description of the overview given in section 2.5.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The number of simultaneous users will be up to 1000 which will require

Memory: 16 GB CPU: 16 core Disk: 100 GB

5.2 Safety Requirements

- Possible loss, damage, or harm: EurekaEats will include safeguards to prevent data/security leaks using tools already available via MongoDB, this is to ensure personal data remains confidential. Mechanisms to prevent data loss include regular scheduled data backups in the case of a system failure.

5.3 Security Requirements

- User identity authentication requirements: Strong password policy (must be over 10 characters with 1 special character), captcha not a robot check.
- EurekaEats will follow security guidelines for products released in California.

5.4 Software Quality Attributes

- Straightforward UI for usability, prevents the user from learning how to navigate through the product. Emphasis on ease of use over ease of learning. This will be done by having basic functionalities/buttons the user has seen before in other applications. In addition, the layout of the screens will be pleasing to the eye so that users can find what they are looking for.
- Well-maintained code: EurekaEats code will be documented thoroughly so that any updates to the software will not result in system failure, in addition to having easily readable code (variable and function names are clearly defined). Having well-maintained code leads to a more reliable product.

5.5 Business Rules

- Main engineers (group members) are considered admins of the product. They will have access to the database (CRUD functions) and code for the product.
- Communication between users of the product and the admins can be done with a report button through the product.

6. Legal and Ethical Considerations

We will reference code sources related to this project not developed by us.

Appendix A: Glossary

See section 1.4 for all abbreviations or special terms.

Appendix B: Analysis Models

TBD

Appendix C: To Be Determined List

TBD