Software Requirements Specification for Software Engineering: subtitle describing software

Team 8 – Rhythm Rangers

Ansel Chen
Muhammad Jawad
Mohamad-Hassan Bahsoun
Matthew Baleanu
Ahmed Al-Hayali

October 11, 2024

Contents

Revision History

Date	Version	Notes
Date 1	1.0	Notes
Date 2	1.1	Notes

1 Purpose of the Project

1.1 User Business

Insert your content here.

1.2 Goals of the Project

Insert your content here.

2 Stakeholders

2.1 Client

The project is academic in nature, hence has no formal clients beyond the supervisor, who will be consulted periodically to direct project effort.

2.2 Customer

Please refer to 2.3 and 2.4 for the current characterization of candidate customers. Section 2.5 will more succinctly specify archetypal customers after candidate customer interviews are carried out.

2.3 Other Stakeholders

- Subject Matter Experts (SMEs) – *To protect the privacy of our stakeholders, SMEs are completely deidentified with the exception of the user group they fall into, if applicable. Were this to be a commercial project, we acknowledge that we would have to, under jurisdiction of the Office of the Privacy Commissioner of Canada, abide by The Personal Information Protection and Electronic Documents Act (PIPEDA). Further, we have elected, for the interim, not to include a formal conflict resolution agreement as stakeholders' interests will be considered only under discretion of the development team.*
  - Music Producers & Sound Engineers (*subsequently "producers"*)

    - *Target subject matter knowledge:* description of current process and/or approach used to guide recording artists to explore or experiment with a new sound. For example, "*while recording, if I get an idea, I play a song with a specific cool feature (take tempo for example) and iteratively incorporate it into the current song being recorded, guiding the artist to adjust (e.g., incorporating a different cadence) across different attempts to incorporate the experimental feature.*"
    - *Extent of project involvement:* minimal, i.e., no more than three interviews per producer.
    - *Influence on project:* moderate-low – technology-keen producers may be more likely to already have a process into which *GenreGuru* can be integrated, i.e., song featurization can quickly, and in large volumes, summarize music that the producer's target audience listens to, allowing the producer to better tailor their music output. Such a producer's insights can inform and guide development, but at the discretion of the development team.
- Musicians
    - *Target subject matter knowledge:* description of current process and/or approach used to generate novel ideas for unrecorded songs or experimenting with different ideas for already recorded songs. *We must be cautious so as to only consider the experimentation component of the musician's workflow, not the music creation in its core.*
    - *Extent of project involvement:* minimal, i.e., no more than three interviews per musician.
    - *Influence on project:* moderate – like technology-keen producers, we suspect musicians may already have a process into which *GenreGuru* can be integrated, i.e., song recommendation can quickly, and in large volumes, expose the musician to songs with desirable features as they explore how to create their own song. The musician's insights can inform and guide development, but again, at the discretion of the development team.
- Music Theorists

    - *Target subject matter knowledge:* description of current process and/or approach used to generate novel ideas for composing new songs or experimenting with different ideas for arranging existing songs. *Yet again, we must be cautious so as to only consider the experimentation component of the theorist's workflow, not the composition or arrangement process in its core.*
    - *Extent of project involvement:* minimal, i.e., no more than three interviews per theorist – *though, we currently do not have any candidate music theorists.*
    - *Influence on project:* moderate-low – music theorists may already have a process into which *GenreGuru* can be integrated, similar to producers, i.e., song featurization can quickly, and in large volumes, summarize music from a catalogue of songs of interest to identify similarities and differences in their sound properties based on their composition and arrangement. At the discretion of the development team, the music theorist's insights can inform and guide development geared for very musically literate users.
- Music Educators
    - *Target subject matter knowledge:* description of current process and/or approach used to introduce students to novel music concepts through experimentation or experimenting with different ideas for previously-learned (composite) concepts. *We must be cautious so as to only consider the experimentation component of the teacher's workflow, not the teaching practice or philosophy in its core.*
    - *Extent of project involvement:* minimal, i.e., no more than three interviews per teacher – *though, we currently do not have any candidate music teachers.*
    - *Influence on project:* low – music teachers may already have a process into which *GenreGuru* can be integrated, i.e., song generation can (relatively) quickly, and in (relatively) large volumes, produce sound artifacts that introduce novel music concepts or demonstrate alternative use of one or more previously-learned concepts. Like other stakeholders, at the discretion of the development team, the music teacher's in-

sights can inform and guide development geared for *shared* music experimentation settings.

- Affiliated corporation staff – *out of scope*
  - Label staff – *publishers, marketers, lawyers, & executives*
  - Production studio staff – *studio managers, instrument maintainers, & sound designers*
- Development team – *exclusively involves team members, so out of scope.*
- Maintenance team – *exclusively involves team members, so out of scope.*
- Music regulators – *song licensing laws to abide by when acquiring training data is the only applicable concern, otherwise out of scope. For the interim, API documentation and metadata dictionaries suffice as a resource.*

2.4 Hands-On Users of the Project

The first four stakeholders of section 2.3 are the users of concern. To maximize project reach, we do not distinguish between separate user groups with regards to some characteristics, i.e., experience level in the subject matter or technology, attitude toward technology, and physical location. A user can be any combination of: a beginner, novice, intermediate, advanced, or expert in the subject matter or technology, they may be timid to use technology or a technology fanatic, and they can be located anywhere that is within reach of our service area. What varies between user groups are their relevant responsibilities, outlined below.

- Music Producers & Sound Engineers – *Edit, mix, and master live & recorded audio; facilitate experimentation with instruments, audio effects, and lyrics.*
- Musicians – *Play instruments and/or sing in live & recorded settings; experiment with instruments and vocals.*
- Music Theorists – *Compose new pieces of music; arrange existing music compositions.*

- Music Educators – *Conduct personal and group instruction sessions to present novel music concepts; reintroduce previously-learned music concepts used in a novel setting; present combinations of previously-learned music concepts.*

2.5 Personas

- Music Producers & Sound Engineers
  - Fictitious name – *Brianna Barboza*
  - Fictitious age – *31*
  - Relevant job – *Accountant*
  - Relevant hobbies – *Disc jockeying*
  - Relevant music genres – *pop & hip-hop*
  - Relevant likes/dislikes – TBD after interviews
  - Technology attitude – *comfortable using digital tools, but prefers analog when it comes to audio.*
- Musicians
  - Fictitious name – *Luis Braga*
  - Fictitious age – *24*
  - Relevant job – *N/A, studying for a MSc in Chemistry and Biochemistry from UWaterloo*
  - Relevant hobbies – *Breakdancing*
  - Relevant music genres – *Samba & Bossa Nova*
  - Relevant likes/dislikes – TBD after interviews
  - Technology attitude – *very proficient, he grew up spending his free time in an internet café before starting university.*
- Music Theorists
  - Fictitious name – *Goran Kodeski*
  - Fictitious age – *31*
  - Relevant job – *Consulting*

  - Relevant hobbies – *Collecting LP vinyl records*
  - Relevant music genres – *Folk & Jazz*
  - Relevant likes/dislikes – TBD after interviews
  - Technology attitude – *vehemently anti-digital, owns a flip-phone without a SIM card, and only uses VoIP.*

- Music Educators
  - Fictitious name – *Tumanako "Tui" Teka*
  - Fictitious age – *44*
  - Relevant job – *Music teacher*
  - Relevant hobbies – *Swimming in Lake Waikaremoana*
  - Relevant music genres – *Pūoro Māori*
  - Relevant likes/dislikes – TBD after interviews
  - Technology attitude – *complete beginner, and he only ever goes to the studio to record something he's performed a few times prior.*

2.6 Priorities Assigned to Users

This section builds on 2.4, appointing *music producers* & *musicians* key users, then music theorists & music educators secondary users. These priorities may change as interviews are conducted and different user groups become more concrete.

2.7 User Participation

Further extending 2.4, all users will be notified that they will be involved in no more than 3 interviews as mentioned in the extent of project involvement in 2.3. Should a user be willing to further contribute to the project after three interviews, they will be contacted as sparingly or generously as they outline. Asynchronous communication via e-mails and text are unrestricted, but expected to be within reason and not to cause a disturbance to its recipient.

2.8 Maintenance Users and Service Technicians

The maintenance team exclusively involves the team members, thus is considered out of scope and will not be explored in detail.

3 Mandated Constraints

3.1 Solution Constraints

Insert your content here.

3.2 Implementation Environment of the Current System

Insert your content here.

3.3 Partner or Collaborative Applications

Insert your content here.

3.4 Off-the-Shelf Software

Insert your content here.

3.5 Anticipated Workplace Environment

Insert your content here.

3.6 Schedule Constraints

Insert your content here.

3.7 Budget Constraints

Insert your content here.

3.8 Enterprise Constraints

Insert your content here.

4 Naming Conventions and Terminology

4.1 Glossary of All Terms, Including Acronyms, Used by Stakeholders involved in the Project

Insert your content here.

5 Relevant Facts And Assumptions

5.1 Relevant Facts

Insert your content here.

5.2 Business Rules

Insert your content here.

5.3 Assumptions

Insert your content here.

6 The Scope of the Work

6.1 The Current Situation

Insert your content here.

6.2 The Context of the Work

Insert your content here.

6.3 Work Partitioning

Insert your content here.

6.4 Specifying a Business Use Case (BUC)

Insert your content here.

7 Business Data Model and Data Dictionary

7.1 Business Data Model

Insert your content here.

7.2 Data Dictionary

Insert your content here.

8 The Scope of the Product

8.1 Product Boundary

Insert your content here.

8.2 Product Use Case Table

Insert your content here.

8.3 Individual Product Use Cases (PUC's)

Insert your content here.

9 Functional Requirements

9.1 Functional Requirements

Insert your content here.

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

Insert your content here.

12.2 Safety-Critical Requirements

Insert your content here.

12.3 Precision or Accuracy Requirements

Insert your content here.

12.4 Robustness or Fault-Tolerance Requirements

Insert your content here.

12.5 Capacity Requirements

Insert your content here.

12.6 Scalability or Extensibility Requirements

Insert your content here.

12.7 Longevity Requirements

Insert your content here.

13 Operational and Environmental Requirements

13.1 Expected Physical Environment

Insert your content here.

13.2 Wider Environment Requirements

Insert your content here.

13.3 Requirements for Interfacing with Adjacent Systems

Insert your content here.

13.4 Productization Requirements

Insert your content here.

13.5 Release Requirements

Insert your content here.

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

Insert your content here.

15.2 Integrity Requirements

Insert your content here.

15.3 Privacy Requirements

Insert your content here.

15.4 Audit Requirements

Insert your content here.

15.5 Immunity Requirements

Insert your content here.

16 Cultural Requirements

16.1 Cultural Requirements

Insert your content here.

17 Compliance Requirements

17.1 Legal Requirements

Insert your content here.

17.2 Standards Compliance Requirements

Insert your content here.

18 Open Issues

Insert your content here.

19 Off-the-Shelf Solutions

19.1 Ready-Made Products

Insert your content here.

19.2 Reusable Components

Insert your content here.

19.3 Products That Can Be Copied

Insert your content here.

20 New Problems

20.1 Effects on the Current Environment

Insert your content here.

20.2 Effects on the Installed Systems

Insert your content here.

20.3 Potential User Problems

Insert your content here.

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

Insert your content here.

20.5 Follow-Up Problems

Insert your content here.

21 Tasks

21.1 Project Planning

Insert your content here.

21.2 Planning of the Development Phases

Insert your content here.

22 Migration to the New Product

22.1 Requirements for Migration to the New Product

Insert your content here.

22.2 Data That Has to be Modified or Translated for the New System

Insert your content here.

23 Costs

Insert your content here.

24 User Documentation and Training

24.1 User Documentation Requirements

Insert your content here.

24.2 Training Requirements

Insert your content here.

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?