SilentSignal:

System Proposal Part 1 + 2

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CSC 3150 05/21/24

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To ensure the system meets the user's needs, it is vital for the system to capture certain data to store in the database. First, the system will need personal information from the user. This includes their full name, email address, password, authentication information, and university credentials. Second, the system will need to payment cards and payment transactions. Third, the system will need to store user progress. This includes module completed, quiz scores, mission completed, and

Executive Summary

SilentSignal (SSG) is a mobile application that enhances users' communication skills through an entertaining, innovative platform. It addresses declining social skills and the critical need for communication enhancement skills. For users, the product will provide them with enhanced communication skills. For institutions, the product will provide them with a learning management system for communication majors and minors. SSG will make life easier for both users and institutions by providing them with targeted practices for communication skills enhancement.

1.0 Introduction and Overview

SilentSignal, referred to as SSG, is a mobile application designed to enhance users' communication skills through covert operations -all conducted online. The application features a communication platform where users can collaborate with friends and fellow users to complete communication missions. Users can expect quizzes on rhetoric dissection, cognitive biases, cultural communication, and interpersonal communication.

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Problem Statement

Fortune magazine has highlighted the significance of communication skills in a practical work team. Despite this, UCLA psychological studies have raised concerns about children's declining social skills because of the potential correlation between increased media consumption and decreased face-to-face interaction. Given the significance of communication and its decline, individuals must develop communication strategies. Common methods of communication enhancement have incorporated public speaking courses and communication coaching applications, often lacking engagement.

Our customers, including education administrations and their students, need an immersive communication training experience. SSG seeks to address this disparity by offering online covert operations to enhance communication. Moreover, SSG includes quizzes on various communications topics, addressing the opportunity to support individuals' interpersonal and perception skills.

Project Vision and Scope

SSG will enhance communication skills by offering an immersive, online platform where users engage in covert missions or quizzes to enhance their interpersonal and perception skills. In response to this vision, SSG will be an iOS mobile application, leveraging a cloud-based hosting infrastructure with a platform as a

service (PaaS) approach, that fosters user collaboration, allowing them to complete missions together. For child safety and protection purposes, SSG will restrict content for users under 13.

Requirements Summary

- The system should provide an immersive, online platform for users to engage in covert missions or quizzes.
- Users should be able to collaborate with other users to complete missions.
- The platform should feature quizzes and exercises covering topics such as rhetoric dissection, cognitive biases, cultural communication, and interpersonal communication.
- The application should include features to promote user engagement, such as notifications for new missions, progress tracking, and leaderboards, to encourage competition.
- The application should be restricted to users aged 13 and above to comply with COPPA (Children's Online Privacy Protection Act).
- The platform should support scalability to accommodate growth in the user base and effectively handle fluctuations in user traffic.
- The application should follow a subscription-based model to ensure sustainability and profitability.
- The application should feature a feedback mechanism to allow users to provide input and report issues.

Stakeholders and Their Interests

- Project Sponsor
    - Andy Cameron aims to oversee SSG.
- Project Manager and Requester
    - Jazmin Chavez Peraza aims to deliver a mobile application that enhances communication skills.
- Computer Science Department
    - The Computer Science Department aims to ensure the application aligns with Seattle Pacific University's mission statement, ethical guidelines, and academic goals.
- Development Team
    - The development team wants to build a scalable user-friendly application that contains a communication platform and educational quizzes. The development teams want to ensure they meet the project timeline.
- Application Moderators
    - Application moderators seek to ensure that the application content and user-generated content maintain a safe environment within the application.
- Communication Departments and Educational Institutions
    - Communication departments and educational institutions want an immersive application to help students develop communication strategies relevant to real-world scenarios. They will assess the effectiveness of SSG as an educational tool.
- COPPA Compliance Authorities
    - Ensure the application complies with COPPA to protect the privacy and safety of underage users.
- Apple Store Team
    - The Apple Store team seeks to ensure the application meets their guidelines.
- End users

    - End users want an engaging, immersive, and effective platform that enhances their communication and perception skills.
- Competitors
    - Competitors seek to monitor SSG's potential impact on the competitive landscape.
- The Marketing Department
    - The marketing department wants to identify the unique selling proposition of SGG, increase app store optimization, and use customer relationship mag ament tools to encourage app adoption and retention.
- Analysts
    - Business, system, data, market, and functional analysts want to ensure that SSG is designed, developed, and installed.
- Communication Experts
    - Communication professors, researchers, consultants, and specialists need to ensure that the content of SSG is credible and educational for the users.
- Cloud Service Providers
    - Cloud Service Providers want to enable the app to scale resources based on demand.

Expected Costs and Benefits

Business Benefits:

- Enhanced communication skills
    - The system is expected to improve users' communication skills through immersive experiences and exercises, leading to better interpersonal relationship, a higher degree of confidence, and enhanced professional opportunities.
- Improved perception skills
    - By engaging in missions and quizzes focused on perception and communication techniques, users can develop a deeper understanding of social cues, cultural nuances, and nonverbal communication, enhancing their ability to interpret and respond effectively in various social and professional contexts.
- Community building
    - The collaboration features within the platform promote teamwork and community building among users, fostering a supportive environment for learning and skill development.

Cost Areas:

- **Application Development Cost**
    - Cost of discovery/strategy stage:
        - $1,200 (Patadiya, 2022).
    - Cost of design stage:
        - $2,500 (Patadiya, 2022)
    - Cost of development:
        - $3,000 (Patadiya, 2022)
    - Cost of testing and deployment
        - $5,000 (Patadiya, 2022)
    - The total cost will range from $10,000 - $49,000 to fully complete and launch the project (Patadiya, 2022).
- **Maintenance Cost**
    - App stores developer fee:
        - $99 at Apple (Georgiou, 2021)
    - Bug fixing and updates:

        - $1,000 - $2,000 (Georgiou, 2021)
    - Push notifications:
        - $10 (Georgiou, 2021)
    - Payment Gateways
        - : $149 (Georgiou, 2021)
    - Servers:
        - $100- $200 (Patadiya, 2022)
- **Profit**
    - One time cost:
        - $10
    - ongoing:
        - $1 Monthly

Constraints

- **Live Communication Challenges:**
    - The communication platform will require reliable network connectivity and low latency; without one, users may have difficulty completing the covert operations.
    - The system will optimize the application design to be network-efficient by minimizing the amount of data transferred and how data is transmitted.
- **Content Moderation**
    - User-generated content requires moderation to prevent harmful content. Adding additional work for the development team can affect the development process.
    - To mitigate harmful user content, the system will use a content filtering algorithm.
- **Educational Content Management**
    - The system will be dependent on communication experts for content development. Thus, the educational content's accuracy depends on the experts and delays may occur in the development process if no communication experts are available.
    - To mitigate this issue, the system can rely on other experts within the communication field. This can include researchers, professors, linguists, speechmakers, and media relations specialists.

Recommendation

As the next steps, SSG records outlining timelines and milestones for the project. In each phase, the team should move according to the budget and meet legal compliances. Further, the team should establish regular communication with stakeholders to ensure ongoing collaboration and progress towards the minimal Viable Product. Lastly, the team should develop a launch strategy.

Document Overview

This system proposal details SSG's goals, requirements, functionalities, and design approach. Initially, the proposal includes the Project Initiation Request, marking the initial approval of the product. Subsequently, the document evaluates the feasibility of the project. Following this, the proposal covers functional, data, and non-functional requirements. Finally, the system proposal presents use-case diagrams, outlines the desired system feature for future implementations, and concludes with recommendations.

2.0 System Initiation

Project Initiation Request (PIR)

PIR-00000 *[PIR Number to be assigned by the Project Office]* Project Initiation Request (PIR) – Level1 v6.0

Project Name: ___*Spy_Skill_Trainer_App: SilentSignal* _____ Student Name: *_Jazmin_Chavez* ___

This Project Initiation Request (PIR) is to be completed for all requests expected to require over 40 hours of effort or over 4 weeks of total duration. For larger requests requiring over 40 person-days or estimated project costs greater than $5,000, this template is used to assess the product's feasibility and get approval to scope and plan the proposed project.

If approved, the Level 2 template (System Proposal: Part 1 and Part 2) must be completed.

NOTE: Sections 0-4 are required. Section 5 is optional, but any ideas on estimating costs should be included. **Replace the *italic* prompts with your answers/information**. [Expand each section in this template as needed**.]**

0. General Project Information

Project Name:	*SilentSignal*
Two Sentence Request Description:	*SilentSignal is a mobile application that enhances users' communication skills through covert operations -all conducted online. The application features a communication platform where users can collaborate with friends and fellow users to complete communication missions. Users can expect quizzes on rhetoric dissection, cognitive biases, cultural communication, and interpersonal communication.*
Requested Launch Date(s):	*One year, 04/16/25*
Department(s) Affected By Project:	*Communication departments that are seeking to enhance their student's communication skills.*
Project's Customers:	*Individuals who are pursuing robust communication.*
Date Request Submitted:	04/16/24

1. Project Sponsor and Manager

Project Sponsor

Name:	Andy Cameron
Title:	Professor
Department:	Computer Science - SPU
eMail:	acameron@spu.edu

Business Project Manager & Requestor

Name:	*Jazmin Chavez Peraza*
Title:	*SilentSignal*
Department:	*Computer Science Department*
eMail:	*Chavezj3@spu.edu*

2. Business Problem or Opportunity: The motivation for this request

Describe the problem or opportunity that you would like to solve. Include a simple, high-level description of this request's business problems or opportunities. Focus on the problem or opportunity, not the solution. Be sure to include any date or deadline-related dependencies or needs related to the project.

The why and what? (Do not include 'the how' at this stage.)

Fortune magazine has highlighted the significance of communication skills in a practical work team. On the other hand, UCLA psychological studies have raised concerns about children's declining social skills because of the potential correlation between increased media consumption and decreased face-to-face interaction. Given the significance of communication and its decline, individuals must develop effective communication strategies.

Conventional methods of communication enhancement have incorporated public speaking courses and communication coaching apps, leaving users needing an entertaining training experience. SilentSignal seeks to address this disparity by offering immersive, online covert operations. One mission may prompt a user to deliver an impromptu speech utilizing SilentSignal's communication platform while simultaneously assigning another user to question the speaker. In another mission, one user may be instructed to adjust their communication approach to a high-context style. In contrast, another user is assigned to discern whether the style is low or high context. SilentSignal includes missions and quizzes on various communication topics, addressing the opportunity to support an individual's interpersonal and perception skills.

3. Justification, Impact, and Importance

What is the financial impact and justification for this request? How will investing time, resources, and capital be returned to our company? (Please note any contractual or regulatory requirements associated with the request. If you have an NPV, IRR, or ROI calculation, please provide the link(s) in this section.)

Assumptions

▪ *Include at least two. Add more rows to each table as needed.*
▪ Individuals are willing to pay for an application that educates them on communication and perception skills.
▪ This product will have increased demand as the demand for communication skills grows.

Competitive Landscape / Context

▪ *Include at least two.*
▪ Speeko tracks user's voice and speech patterns in real-time. However, the UI lacks professionalism and has difficulty recognizing speech.
▪ There is limited competition for perception and communication training applications.

Tangible Return, Opportunity, or Value	One Time	On-Going
▪ *Include at least two. Estimate the best you can.*	$ 0	$ 0
▪ The customers would provide profit for the application, receiving access to an innovative application.	$ 10	$ 1 (Monthly)
▪ The customer would enhance their communication skills.		N/A

Intangible Benefits	Impact or Value
▪ *Include at least two.*	$ 0
▪ The customers would develop enhanced perception and communication skills.	N/A
▪ The customers would get an entertaining application to develop the skills mentioned above.	N/A

4. Product Requirements

The Project team will gather detailed requirements once the project is approved. Use this section to articulate the critical solution components to help scope the project's size and complexity. Do not describe how the solution will be implemented; instead, only list the functionality or results you expect to receive when the product is complete/delivered.

4.1. Must Haves

4.1.1.	*Include at least two. Add more rows to each table as needed.*
4.1.2.	SilentSignal will have interactive missions covering communication skills.
4.1.3.	SilentSignal will have quizzes and exercises to educate users on perception and communication techniques.
4.1.4.	SilentSignal will have a communication platform.

4.2. Could Haves (Nice to Haves)

4.2.1.	*Include at least two.*
4.2.2.	The developers plan to gamify the application to reward user usage.
4.2.3.	The developers may use augmented reality.

4.3. Won't Haves (Don't Do's, aka Out of Scope)

4.3.1.	*Include at least two.*
4.3.2.	SilentSignal will not include covert operations that may endanger the user.
4.3.3.	SilentSignal will not be available for children under 13.

5. Project Costs (Operating and Capital: Onetime and Recurring) [Optional]

This section is typically fleshed out after the requestor has submitted a PIR and received approval for the initial scoping effort. It captures the effort estimates, capital expenditures, and other costs associated with performing this work and creating the product/solution. If the submitter has thoughts or estimates on what these costs are or suggestions on how they might be estimated, please include those here. Add brief descriptions as needed. ***Include at least 2 comments on your thinking around these items, even if you don't have specifics yet.***

Labor Costs

Type	Team(s) Affected	Low (hrs)	High (hrs)
Analysis & Design		0	0
Development		0	0
Testing and Quality Assurance		0	0
Systems Integration		0	0
Deployment		0	0
Support and Maintenance		0	0
Sales and Marketing		0	0
Total		**0**	**0**

Comments: *Include notes here on what the costs are or how they can be estimated. (optional)*

Capital Costs (Equipment, Software, Licenses, …)

Description	Quantity	Cost ($)
Item 1		$ 0
Item 2		$ 0
Total		$ 0

Comments: *Include notes here on what these are or how they can be estimated. (optional)*

Maintenance Costs (Costs after the product is live)

Type	Hours / Month Low	Hours / Month High
System / User Support	0	0
Business / Process Support	0	0

Total Support & Maintenance	**0**	**0**

3.0 Feasibility Assessment

Introduction

This section presents an analysis of the project's feasibility including technical, resource, schedule, organizational, legal, and contractual aspects. Feasibility will be evaluated using a scale composed of three categories: risky, feasible, and ideal. The risky category defines aspects of the project that pose a significant challenge that may or may not result in a failure of the project. The feasible category defines aspects of the project that are realistic and achievable. The ideal category defines aspects of the project that are in sync or above the minimal viable product.

Feasibility Analysis

Organizational feasibility

There are no existing systems that address declining communication skills and engaging training modules. There are existing systems to optimize SSG's development. Therefore, the solution is *technically feasible.*

- Forms of communication enhancement, such as public speaking courses, exist. One example is Speeko, an A.I. speech coach that provides its users with instant feedback on their speaking style (Speeko- AI Speech Coach for Public Speaking (apple App of the Day), n.d.). In this regard, there is a low risk. However, SSG incorporates an immersive environment, featuring a communication platform and covert operations. Therefore, SSG maintains a high unique selling proposition.
- SSG will buy an existing communication platform. SSG will develop interactive missions, quizzes, user interface, user experience, and custom integrations. Therefore, the utilization of existing solutions will be ideal.

The consequences of not building SSG pose a *high risk*.

- The users of the system, students and educational institutions, are expected to appreciate the benefits of an immersive communication skill development app with online covert operations. From a business perspective, not developing SSG could result in the loss of capitalizing on this need.

The stakeholder's view of the proposed system and development process is *feasible.*

- SSG has a product sponsor, Dr. Cameron, who will supervise and approve SSG to ensure it aligns with the mission of the computer science department.
- The project manager, Jazmin Chavez Peraza, will corroborate with COPPA authorities, the Apple Store Team, and consumers to validate that their needs are met. She will remain in contact with the development team, application moderators, communication departments,

educational institutions, the marketing department, analysts, communication experts, and consumers to progress the project towards the creation of the minimal viable product.

- Stakeholders aforementioned above will corroborate to meet the minimal viable product.

Technical feasibility

The users' familiarity with the application area is feasible technically, although there is *some risk*.

- In today's world, there is an estimated 1.334 billion active iPhone users (Dean, 2021). Thus, a large quantity of individuals are familiar with apple's mobile applications. Hence, user's installation of the product will be ideal.
- Stakeholders, such as communication departments and educational institutions, have strong knowledge of existing learning management systems; however, they have not worked with an educational app that provides covert missions to its users. In response, the app will provide a tutorial or a walkthrough.

Analysts' familiarity with the application area is *ideal technica*lly.

- Business analysts are familiar with analyzing market trends and customer demands of consumers (White, 2023). Therefore, gathering requirements from communication departments and potential customers to ensure the app meets their needs is ideal.
- System analysts are familiar with adding functionality to computer systems (Computer Systems Analysts: Occupational Outlook Handbook:: U.S. Bureau of Labor Statistics, 2024). Therefore, assessing that different components of SSG, such as the communication

platform, quizzes, and interactive missions, function well together within a mobile app development framework is feasible.

- Data analysts are familiar with monitoring app performance metrics to identify growth areas. Therefore, analyzing ways to improve the design of missions, quizzes, and educational content is ideal.
- Market analysts are familiar with analyzing competitive landscapes (Market Research Analysts: Occupational Outlook Handbook:: U.S. Bureau of Labor Statistics, 2024). Thus, advising how to position SSG in the market to augment installations is ideal.
- Communication experts can provide communication and perception content that aligns with the goals of academic institutions. Thus, forming the educational content of SSG is ideal.
- Functional analyst are familiar with utilizing technology to improve procedures (Domingos, 2023). Thus, ensuring that different departments within SSG have an efficient operational process is ideal.

Development group's familiarity with the target technology is *ideal*.

- The development team is familiar with mobile application development and learning management systems. The feasibility is ideal in this aspect.
- The app will run in one platform, iOS, thus the deployment process will be ideal.

The project size is considered *medium risk.*

- The project timeframe cannot exceed a year in order to meet the stakeholder's and consumer's expectations.
- The system has a variety of content types, such as missions, quizzes, augmented reality, and gamification, some of which will have to be implemented in successive versions. The

feasibility is risky in this aspect. In response, SSG will focus on designing the minimal viable product.

- Subject matter expert involvement will be required.

The project structure is considered *feasible*.

- The main components of the system are unlikely to change and should not cause the project to fail.

Resource feasibility

The People

- SSG's developers have created mobile applications in the past and are well equipped to create SSG. There are many senior developers who have 5+ years of experience in learning management systems, communication platforms, and content creation.

The Hardware

- SSG may need to purchase Mac computers to develop the iOS app.
- SSG may need to purchase various iPhone devices for testing.

The Software

- SSG will be built using the modern Swift programming language, as recommended by Apple (Getting Started with iOS App Development / AWS, n.d.).
- SSG may need to purchase an Xcode license for each developer (Getting Started with iOS App Development / AWS, n.d.).
- SSG will need a data encryption software license.
- SSG will need a general data protection regulation tool.
- SSG will need the Apple Developer Program Membership to distribute the app (Apple Inc., n.d.).
- SSG will need tools to track the app performance.
- SSG will need tools to manage customer support.

The Environment

- SSG will need to run the latest version of Xcode, Apple's integrated development environment since SSG will only run on iPhones. Xcode includes the iOS software

development kit, tools, compilers, and frameworks to develop code (Getting Started with iOS App Development / AWS, n.d.).

- SSG will need to subscribe to a cloud service provider (SaaS/ PaaS).

Schedule Feasibility

Meeting time frames and completion dates is *ideal.*

- The deadline for this project is in spring, and finishing this product at a later time will not pose as a problem as multiple versions of this system will be released over time.
- Slippage will not increase development costs as the project manager, Jazmin Chavez, has added buffers to the project schedule. Moreover, the team will follow the agile development methodology to respond quickly to backlogs.
- All resources will be available on time to start the development process. If any other additional products or tools are needed, they can be added to subsequent versions.

Legal and contractual feasibility

Risk regarding compliance standards is low or feasible.

- SSG has signed a contract to follow the Family Educational Rights and Privacy Act to protect student's educational records.
- SSG will require developers, vendors, and end users to sign an end-user license agreement that details the rights of the users.
- SSG will comply with the General Data Protection Regulation and the California Consumer Privacy Act.
- SSG will sign the Apple Developer Program Licence Agreement.
- SSG will follow the Payment Card Industry Data Security Standard for subscription services.

<u>Additional Comments</u>

- We should consider hiring lawyers to assist with the legal and contractual aspects of the project.

<u>Conclusion</u>

SSG is a feasible app; however, the project manager has reservations regarding its cost and potential profitability. Currently, users are expected to pay a onetime fee of $10, along with a monthly subscription of $1. However, the expenses for SSG are predicted to range from $10,000 - $49,000, excluding the software and hardware costs. To address this financial problem, the project manager recommends shifting to a licensed sucritpm model. Under this approach, universities would pay a recurring fee based on the users accessing the platform. Simultaneously, students will be charged with the onetime and monthly fee. Thus, augmenting the apps' profitability.

4.0 Requirements Definition

SSG will secure and require user information, track the user's progress, and report back to the user and client. To do so, developers will focus on the user interface, performance characteristics, and error handling.

Introduction

This section will discuss the functional and non-functional requirements. Functional requirements are what the system does. Nonfunctional requiems are what the system is.

Functional Requirements

Must and Should Requirements

1. Authenticate User with University Credentials
    a. The user signs in using university credentials.
    b. Alternatively, the user may create an account outside of an institution.
    c. SSG must require the user to agree to the terms of service.
    d. SSG will need a database of basic information about the user's name, educational institution, communication class, similar to the database Canvas contains.
    e. SSG will require users to sign in using their university's credentials.
2. Obtain OneTime and Subscription Payment Card
    a. SSG must obtain a onetime payment of $10 from the user and obtain payment information for the future $1 monthly subscription.
3. Track the User's Progress
    a. Users will access SSGs' content to look for specific communication enhancement topics. Topics may include rhetoric dissection, cognitive biases, cultural communication, and interpersonal communication. Some users will search for content specific for their class, whereas other will want to browse for intriguing content.
    b. When the user has found the content they want to access, the user will progress through their selection of the communication module.
4. Unlock Quizzes, Missions, and the Communication Platform
    a. The system will verify the user's progress to unlock quizzes, missions, and the communication platform.
    b. After unlocking missions, the system will provide covert missions designed to engage the user in practicing a communication skill with another user through a communication platform.
    c. The system will allow users to opt out of these covert missions if the educational institution does not make them mandatory.
5. Report the User's Progress
    a. The system will provide the user with immediate feedback upon completion of each mission and and or quiz.
    b. The system should report the user's progress back to the educational institution that purchased a licensed subscription model from SSG.
6. Send Leaderboard Notifications
    a. The system should send notifications for leaderboards to encourage competition.
    b. The system must allow the user to opt out of these notifications.

Could Have Requirements

7. Generate Virtual Environments
    a. The system may generate immersive securities for communication practice in virtual governments.

Data Requirements

To ensure the system meets the user's needs, it is vital for the system to capture certain data to store in the database. First, the system will need personal information from the user. This includes their full name, email address, password, authentication information, and university credentials. Second, the system will need to payment cards and payment transactions. Third, the system will need to store user progress. This includes module completed, quiz scores, mission completed, and communication platform usage. The system will also need to include content data and feedback information.

Non-functional Requirements

8. Provide Tutorial
    a. The primary users will be college students in communication courses.
    b. The system will have a tutorial to guide users on the system navigation.
    c. The user interface must be user-friendly and easy to learn.
9. Ensure Error Handling
    a. The system must provide feedback to the users quickly.
    b. The system must handle concurrent user sessions.
    c. The system should provide feedback to users with incorrect answers in quizzes. The system should allow the users to retake the quiz twice. After failing the quiz more than two times, the user should be redirected to the module they are failing.

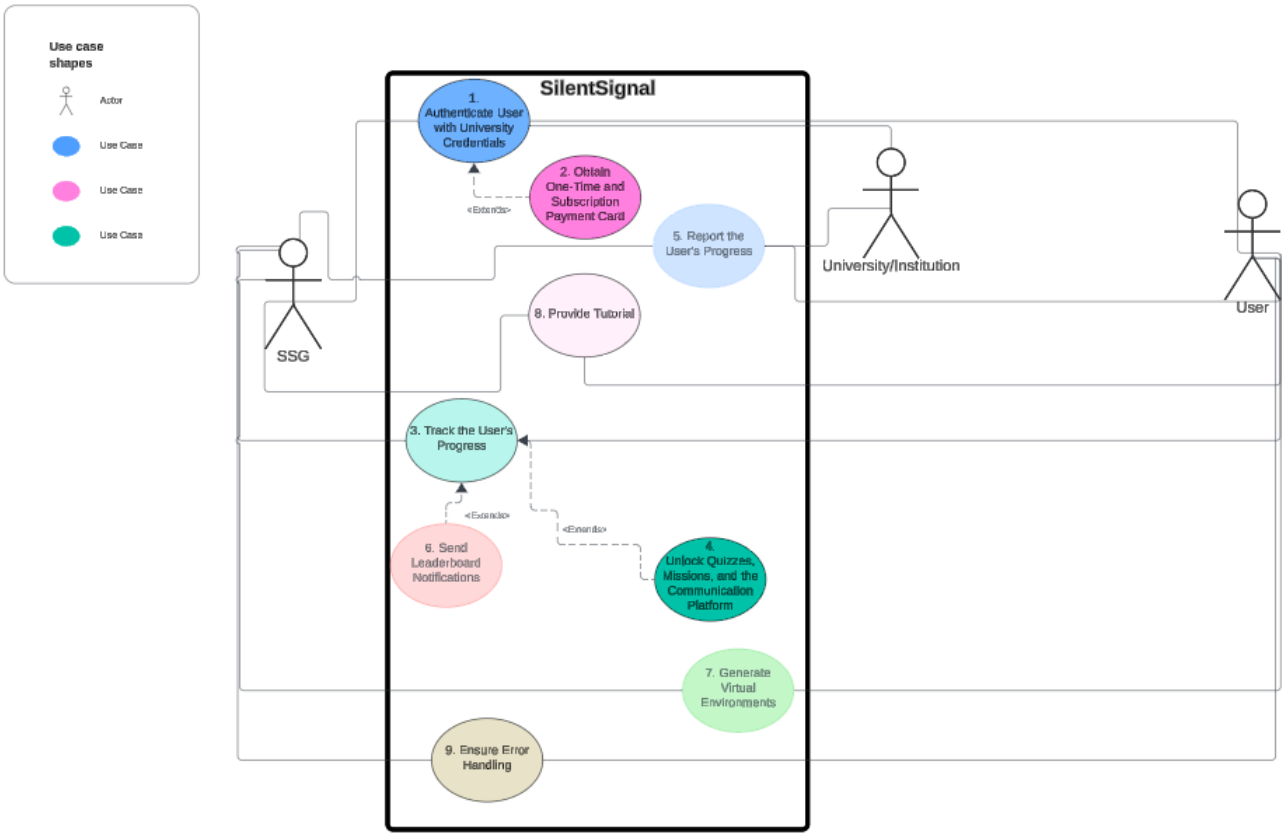
5.0 Requirements Model

Introduction

This section provides an overview of the system's functionalities through a diagram following descriptions of the diagram. These diagrams represent interactions between the system and the users. The descriptions provide a thorough explanation of the sequence of actions that occur in each interaction.

Use-Case Diagram

Jazmin Chavez Peraza
SilentSignal Use-Case Diagram
Dr. Cameron
CSC 3150
05/21/24



Use-Case Descriptions

Use Case Name: Authenticate User with University Credentials	**ID**: 1	**Importance**: Must Have
Primary Actor: User	**Use Case Type**: Detail/Real	
Supporting Actors: • SSG's System • University–specifically, the authentication system		
Stakeholders and Interests: • User–wants a safe and secure system. • University–wants to ensure that only its students access its paid subscription access. • SSG–wants to ensure compliance with data security and FERPA.		
Brief Description: The User signs in using their university credentials. Alternatively, users can create an account outside of the institution. SSG requires users to agree to the terms of service and stores basic user information in a database.		
Trigger: User attempts to log in or create an account. **Type** (mark one): ✓ External ___ Temporal		
Relationships: **Association**: SSG, the university, and the student/user. **Include**: **Extend**: • This use case extends to Use Case 2, where the system must obtain a one time payment method. This is an extends relationship as this payment is only made once. It does not occur every time the user attempts to log in. **Generalization**:		
The Normal Flow of Events: 1. User opens the app. 2. User creates an account using their university email. 3. System redirects the user to the university authentication page. 4. User enters their university credentials. 5. University verifies credentials. 6. User is redirected to SSG. 7. SSG grants access. 8. User agrees to terms of service. 9. User logs in.		

Sub-flows:

Alternate/Exceptional Flows:

In step 2, if the user has already created an account:

1. User signs in.
2. Flow resumes in step 4 and the system skips step 8.

In step 1, if the user is creating an account outside of the university:

1. User selects to create an account outside of the institution.
2. User enters required information such as name, major, email, birthdate, username, and password.
3. System verifies and stores user information.
4. User agrees to terms of service.
5. SSG stores the information in the database.
6. Flow resumes in step 9.

In step 8, if the user does not agree to the terms of service:

1. SSG denies access until the user agrees.
2. Flow resumes in step 9.

In step 5, if the University authentication system rejects the credentials:

1. User is prompted to re-enter credentials or contact support.
2. Flow resumes in step 2.

Special Requirements:

- User interface for terms of service agreement.
- A secure connection to university authentication system.
- Data privacy compliance following FERPA for storing user information.

To do/Issues:

- Establish compatibility with various university authentication systems.

Use Case Name: Obtain OneTime a Subscription Payment Card	**ID**: 2	**Importance**: Must Have
Primary Actor: User	**Use Case Type**: Detail/Real	
Supporting Actors: • Payment gateway		
Stakeholders and Interests: • User–wants a secure payment process. • SSG–Needs to collect payment securely. • University–Wants to ensure students maintain subscription during their school term.		
Brief Description: SSG must obtain a onetime payment of $10 from the user and obtain payment information for a future $1 monthly subscription. SSG must also collect payment from the University.		
Trigger: User creates an account and wants to access content. **Type** (mark one): ✓External ___ Temporal		
Relationships: **Association**: SSG, the university, and the student/user. **Include**: **Extend**: **Generalization**:		
The Normal Flow of Events: 1. User creates an account. 2. System prompts the user for a onetime payment of $10. 3. User enters payment information. 4. System processes the payment through a gateway. 5. System confirms the payment and stores payment information for the future monthly subscription.		
Sub-flows: In step 4, if the payment processing fails: 1. Payment gateway rejects the payment. 2. User is notified. 3. User is prompted to re-enter payment information. 4. Process resumes in step 5.		
Alternate/Exceptional Flows: In step 5, if the user decides to cancel payment: 1. System cancels transaction and does not grant access to SSG's services.		

Special Requirements: • Ensure compliance with the payment card industry.
To do/Issues: • Find a reliable payment gateway and test functionality of the implementation frequently.

Use Case Name: Track the User's Progress	**ID**: 3	**Importance**: Must Have
Primary Actor: User	**Use Case Type**: detail/real	

Supporting Actors:

- SSG

Stakeholders and Interests:

- User–wants to complete assignments on time.
- Institutions–wants to ensure students complete assignments.
- SSG–needs to track user's progress in order to unlock other services.
- Communication Experts–want to ensure that content is accurate and up to date.

Brief Description:
Users access SSG content to look for specific communication enhancement topics. They may progress through a professor selected module, or a self selected module.

Trigger: User accesses content to complete a module.

Type (mark one): ✓External ___ Temporal

Relationships:

Association:

- User access content.
- SSG provides content.

Include:

Extend:

- Use Case 6: The user may select to receive leaderboard notifications.
- Use Case 4: The user may or may not unlock Use Case 4.

Generalization:

The Normal Flow of Events:

1. User logs in to SSG.
2. User searches for communication topics or professor selected module.
3. User selects content.
4. User progresses through selected module.
5. System tracks and records user progress.

Sub-flows:
In step 1,2,3, and 4 the user will:

1. Have an option to view the leaderboard
2. Process resumes in step 5.

Alternate/Exceptional Flows:

Special Requirements: • Reliable content
To do/Issues: • Ensure all content is searchable under various names.

Use Case Name: Unlock Quizzes, Missions, and the Communication Platform	**ID**: 4	**Importance**: Must Have
Primary Actor: User	**Use Case Type**: Detail/Real	
Supporting Actors: • SSG		
Stakeholders and Interests: • User–wants to access quizzes, missions, and communication platform when progress criteria is met. • SSG–wants to ensure users are able to access this use case as it is what sets it apart in the market. • Application moderators–want to ensure the communication platform maintains a safe environment.		
Brief Description: The system verifies the user's progress to unlock quizzes, missions, and the communication platform. Users can opt out of missions if not mandatory.		
Trigger: User reaches specific progress milestones. **Type** (mark one): ✓ External ___ Temporal		
Relationships: **Association**: • User whom reaches progress point. • SSG who evaluates whether the point is met. **Include**: **Extend**: **Generalization**:		
The Normal Flow of Events: 1. User completes required progress milestone. 2. System verifies user progress. 3. System unlocks quizzes, missions, and the communication platform. 4. User accesses the newly unlocked features.		
Sub-flows: • User opts out of missions: • System records the user's preference and does not unlock mission.		
Alternate/Exceptional Flows:		

Special Requirements: • User interface for opting out of missions that are not mandatory.
To do/Issues: • Ensure accuracy in progress tracking. • Test opting out functionality.

Use Case Name: Report the User's Progress	**ID**: 5	**Importance**: Must Have
Primary Actor: SSG	**Use Case Type**: Detail/Real	
Supporting Actors: • Educational Institution • User		
Stakeholders and Interests: • Educational institution–wants to ensure users are meeting deadlines and completing assignments. • Users–want to ensure they are finishing assignments on time and want to receive feedback on their work.		
Brief Description: The system provides users with immediate feedback upon completion of each mission or quiz and reports progress back to the educational institution.		
Trigger: user completes a mission or a quiz. **Type** (mark one): ✓External ___ Temporal		
Relationships: **Association**: SSG, educational institution, and student/user. **Include**: **Extend**: **Generalization**:		
The Normal Flow of Events: 1. User completes a mission or quiz. 2. System provides immediate feedback to the user. 3. System logs user progress. 4. System reports progress to institution.		
Sub-flows:		
Alternate/Exceptional Flows:		
Special Requirements:		
To do/Issues:		

Use Case Name: Send Leaderboard Notifications	**ID**: 6	**Importance**: Must Have
Primary Actor: User	**Use Case Type**: Detail/Real	

Supporting Actors:

- SSG

Stakeholders and Interests:

- User–wants to ensure that they see their standings and completion.
- Institution–wants to ensure the users remain motivated.
- SSG–wants to gameify the app.

Brief Description:

The system sends notifications for leaderboards to encourage competition, allowing users to opt out if they choose.

Trigger:

Type (mark one): ✓External ___ Temporal

Relationships:

Association: SSG, institution, user.
Include:
Extend:
Generalization:

The Normal Flow of Events:

1. System updates leaderboard standings.
2. System generates notifications based on new standings.
3. System sense notifications to users.
4. User receive and view notification.

Sub-flows:

- User may select to opt out. System records preference.

Alternate/Exceptional Flows:

Special Requirements:

- User friendly opt out mechanism.

To do/Issues:

Use Case Name: Provide Tutorial	**ID**: 8	**Importance**: Must Have

Primary Actor: SSG/ User	**Use Case Type**: Detail/Real
Supporting Actors:	
Stakeholders and Interests: • User–wants to ensure they know how to navigate the application. • SSG–needs to provide an easy onboarding experience.	
Brief Description: The system will provide a tutorial to guide students in communication course son system navigation, ensuring the user interface is user-friendly and easy to learn.	
Trigger: User logs in for the first time or selects the tutorial option. **Type** (mark one): ✓External ___ Temporal	
Relationships: **Association**: SSG, user. **Include**: **Extend**: **Generalization**:	
The Normal Flow of Events: 1. User logs in for the first time or selects the tutorial option from the menu. 2. System presents and introductory screen explaining the tutorial's purpose. 3. User follows step-by-step instructions on navigating the system. 4. System provides interactive guidance, highlighting key features and functionalities. 5. User completes the tutorial and can revisit it any time.	
Sub-flows: • User may revisit the tutorial any time by selecting it from a menu option.	
Alternate/Exceptional Flows:	
Special Requirements: • User friendly design.	
To do/Issues:	

Use Case Name: Ensure Error Handling	**ID**: 9	**Importance**: Must Have
Primary Actor: User	**Use Case Type**: Detail/Real	
Supporting Actors: • **SSG**		
Stakeholders and Interests: • User–wants quick feedback on errors. • SSG–needs to handle errors gracefully. • Institution–wants to ensure users have a learning environment where mistakes are allowed.		
Brief Description: The system must provide quick feedback to users, handle concurrent user sessions, and offer guidance an retry options for incorrect quiz assets, redirecting users to the module they are failing after multiple failed attempts.		
Trigger: User encounters an error or submits incorrect quiz answers. **Type** (mark one): ✓ External ___ Temporal		
Relationships: **Association**: user, educational institution, SSG. **Include**: **Extend**: **Generalization**:		
The Normal Flow of Events: 1. The user encountered an error. 2. System detects the error and provides immediate feedback to the user. 3. For quiz errors, the system indicates incorrect answers and allowed the user to retake the quiz. The user retries the quiz up to two times. 4. If the user fails the quiz more than twice, the system redirects the user to the module they are failing. 5. System handles multiple concurrent user sessions efficiently, ensuring smooth operation		
Sub-flows:		
Alternate/Exceptional Flows:		

Special Requirements: • Clear and helpful feedback for quiz errors with retry options. • Robust error detection and feedback features. • Efficient handling of concurrent user sessions.
To do/Issues:

6.0 System Evolution

In a future SSG update beyond the Minimum Viable Product, the application should integrate a real-time chat feature for users to interact with instructors and peers. Currently, the application only allows users to interact with other users. However, allowing users to interact specifically with their classmates may result in increased user involvement for the application. Furthermore, it is recommended to have a more scalable database management system as the amount of information augments.

7.0 Conclusions and Recommendations.

SSG seeks to provide a platform where users can learn communication skills while participating in an interactive environment. Upon completion of the functional and non-functional requirements, the system can be further improved by reviewing the user's feedback and implementing it. Further, developers and stakeholders should remember that the product is designed for the user. Thus, any further enhancements should be filtered through the lens of the users.

Appendices

N/A

Glossary

Covert Operations–missions in which users will interact with other uses, concealing the communication skill they are utilizing.
Feasible- aspects of the project that are realistic and achievable.
Functional Requirements–a process or service that must be included in the system to satisfy a stated need and have the system be acceptable to its users.
Ideal–aspects of the project that are in sync or above the minimal viable product.
Legal and Contractual Feasibility–a measure of compliance with legal and contractual obligations.
Minimal Viable Product - the product version that allows the group to collect the maximum amount of outcome with the least effort.
Non-functional Requirements–Descriptions of the characteristics and attributes of the system as well as any constraints that may limit the boundaries of the proposed solution.
Organizational Feasibility - measures the problem's urgency and/or acceptability of the solution.
Platform as a Service–a cloud environment that includes everything developers need to build and manage applications.
Risky - aspects of the project that pose a significant challenge that may or may not result in a failure of the project.
Schedule Feasibility - the extent to which the group can meet the time frame and completion dates.
SSG - SilentSignal, the name of the project and application.
Subscription-Based-Model - a revenue model where users pay a onetime fee and a monthly subscription for continued access.
Technical Feasibility - the extent to which the system can be successfully designed, developed, and installed by our group and for this customer.

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