
Software Requirements Specification

for

Virtual Student Support Assistant (VSSA)

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1. Introduction

1.1 Purpose

This document specifies the requirements for a Virtual Student Support Assistant (VSSA), a software application designed to empower students with a smooth and stress-free university experience. VSSA leverages AI technology and integrates seamlessly with the Student Information Database.

1.2 Document Conventions

- *"Shall" indicates mandatory requirements.*
- *"Should" indicates recommended features.*

1.3 Intended Audience and Reading Suggestions

This document is intended for stakeholders involved in the VSSA project, including developers, system administrators, and university personnel. Familiarity with university systems and student needs is recommended.

1.4 Product Scope

VSSA focuses on providing information access, personalized guidance, connection to resources, and a user-friendly interaction experience for students.

1.5 References

None

2. Overall Description

2.1 Product Perspective

VSSA is a web-based and mobile application accessible to all registered students at the university.

2.2 Product Functions

- Provide information on university policies, procedures, deadlines, and resources.
- Offer personalized course information (schedules, syllabi, grades).
- Assist with course selection and registration.
- Recommend study resources, tutoring services, and academic support programs.
- Schedule appointments with advisors, professors, or career counselors.
- Facilitate communication with relevant departments (financial aid, housing).
- Understand and respond to student questions in natural language.
- Offer reminders and notifications for deadlines, appointments, and events.

2.3 User Classes and Characteristics

- Undergraduate Students.
- Graduate Students.
- International Students.
- Students with Disabilities.

2.4 Operating Environment

- VSSA mobile app (Android, iOS)
- VSSA web interface (accessible through any web browser)

2.5 Design and Implementation Constraints

- Development budget and timeline.
- Available server capacity and software tools.
- Scalability needs for a growing user base.

2.6 User Documentation

User guides and tutorials will be available within the VSSA app and website.

2.7 Assumptions and Dependencies

- The university maintains a comprehensive and up-to-date Student Information Database.
- Students have reliable internet access to utilize VSSA.

3. External Interface Requirements

3.1 User Interfaces

- VSSA shall offer a user-friendly and intuitive interface for both web and mobile applications.
- The interface shall be visually appealing and easy to navigate for users with varying technical skills.

3.2 Hardware Interfaces

The VSSA software application interacts with the following hardware components:

Mobile Devices: Compatible with various operating systems (e.g., Android, iOS) and a range of device screen sizes and resolutions.

Computers: Accessible through web browsers on different computer operating systems (e.g., Windows, macOS, Linux).

3.3 Software Interfaces

The VSSA software application interacts with the following software components:

Student Information Database (SIDB): Secure integration for accessing student-specific data (schedules, grades, registration) using appropriate protocols.

Natural Language Processing (NLP) Tools: Enables understanding of student queries phrased in natural language for accurate response generation.

4. System Features

4.1 Information Access

VSSA shall answer student questions about:

- University policies and procedures.
- Deadlines and resources (scholarships, academic support services, health service).
- Personalized course information (schedules, syllabi, assignments, grades).

4.2 Personalized Guidance

VSSA shall offer guidance on:

- Course selection and registration based on student interests and academic goals.
- Study resources, tutoring services, and academic support programs relevant to specific courses or challenges.
- Time management, note-taking, and exam preparation strategies.

4.3 Connection to Resources

VSSA shall facilitate connections with:

- Advisors, professors, or career counselors by scheduling appointments.
- University facilities (libraries, computer labs, health centers) by providing links or direction.
- Relevant departments for administrative inquiries (financial aid, housing).

4.4 Interaction

VSSA shall:

- Understand and respond to student questions in natural language (text or voice).
- Learn and adapt to individual student needs and preferences over time.
- Offer reminders and notifications for upcoming deadlines, appointments, and events.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- VSSA shall respond to student queries within a few seconds to maintain a smooth user experience.
Data retrieval from the knowledge base and Student Information Database should be optimized for minimal response times.
- Caching mechanisms can be implemented to improve response speed for frequently accessed information.

5.2 Security Requirements

- VSSA shall enforce secure user authentication using strong passwords or multi-factor authentication.
- All student data, including grades, transcripts, and personal information, should be encrypted at rest and in transit.
- VSSA shall comply with data privacy regulations set forth by the university and relevant governing bodies.

6. Domain Requirements

- **Existing Resources and Support Services:** VSSA should complement existing university resources, not replace them. It can act as a first point of contact and direct students to the appropriate department or service provider for more complex needs.
- **Student Data Privacy Regulations:** VSSA must comply with all university data privacy regulations and relevant laws. Student data should be anonymized or pseudonymized where possible, and access should be restricted based on user roles and permissions.
- **Diverse Student Body:** VSSA should cater to a diverse student body. This may involve offering multi-language support and tailoring responses to different learning styles. Additionally, VSSA should be accessible to students with disabilities (considerations for screen readers, text size adjustments).

Appendix A: Glossary

VSSA (Virtual Student Support Assistant): A software application designed to assist students with university-related inquiries and tasks.

SIDB (Student Information Database): The university's database that stores student data such as grades, schedules, and registration information.

Appendix B: Analysis Models

NA

Appendix C: To Be Determined List

- **TBD 1: Specific level of multi-language support for the initial VSSA release.** (e.g., English only, or a limited set of additional languages)
- **TBD 2: Details of the chosen communication protocol(s) for data exchange between VSSA and the SIDB.** (This will depend on the university's infrastructure.)
- **TBD 3: Specific functionalities to be prioritized for the initial development phase of VSSA based on budget and time constraints.** (e.g., basic information access vs. appointment scheduling)

AI Tool Used	Approach to Using the Tool	Full Output Provided by the Tool	Part of the Output Adapted for the Assignment
BARD	<p>Scenario:</p> <p>You are a project manager assigned to develop a Virtual Student Support Assistant (VSSA) to empower students with a smooth and stress-free university experience. VSSA leverages AI technology and seamlessly integrates with the Student Information Database. Imagine VSSA as a virtual assistant specifically designed for university students. It can answer questions, provide personalized guidance, and connect students with resources.</p> <p>Prompt:</p> <p>Based on the scenario above, please help me define:</p> <ul style="list-style-type: none"> • User Requirements: These are statements in natural language describing the services the VSSA should provide and how it should behave from the student's perspective. • System Requirements: These are detailed descriptions of the system's functions and technical specifications needed to fulfill the user requirements. • Functional Requirements: These describe specific actions and functionalities the system should perform to fulfill user needs. 	<p>User Requirements (What the VSSA should do for students)</p> <ul style="list-style-type: none"> • Access Information: <p>Answer questions about university policies, procedures, deadlines, and resources (e.g., scholarships, academic support services, health services).</p> <p>Provide personalized course information like schedules, syllabi, assignments, and grades (requires integration with Student Information Database).</p> • Offer Guidance: <p>Help with course selection and registration based on student interests and academic goals. Recommend study resources, tutoring services, and academic support programs relevant to specific courses or challenges.</p> <p>Offer tips and strategies for time management, note-taking, and exam preparation.</p> • Connect with Resources: 	<p>4.1 Information Access</p> <p>VSSA shall answer student questions about:</p> <p>University policies and procedures Deadlines and resources (scholarships, academic support services, health services)</p> <p>Personalized course information (schedules, syllabus, assignments, grades)</p> <p>4.2 Personalized Guidance</p> <p>VSSA shall offer guidance on:</p> <p>Course selection and registration based on student interests and academic goals, study resources, tutoring services, and academic support programs relevant to specific courses or challenges</p> <p>Time management, note-taking, and exam preparation strategies</p>

	<ul style="list-style-type: none"> • Non-Functional Requirements: These address broader system characteristics that impact usability, performance, and security. 	<p>Schedule appointments with advisors, professors, or career counselors. Provide links or directions to access university facilities like libraries, computer labs, and health centers. Facilitate communication with relevant departments for administrative inquiries (e.g., financial aid, housing).</p> <ul style="list-style-type: none"> • Personalized Interaction: <p>Understand and respond to student questions in natural language (text or voice). Learn and adapt to individual student needs and preferences over time. Offer reminders and notifications for upcoming deadlines, appointments, and events.</p> • Accessibility and Availability: <p>Be accessible 24/7 through various channels (mobile app, chat interface, website). Offer support in multiple languages to cater to a diverse student body.</p> <p>System Requirements (How the VSSA will achieve user needs)</p>	<p>4.3 Connection to Resources</p> <p>VSSA shall facilitate connections with: Advisors, professors, or career counselors by scheduling appointments University facilities (libraries, computer labs, health centers) by providing links or directions Relevant departments for administrative inquiries (financial aid, housing)</p> <p>The VSSA software application interacts with the following software components:</p> <p>Student Information Database (SIDB): Secure integration for accessing student-specific data (schedules, grades, registration) using appropriate protocols.</p> <p>Natural Language Processing (NLP) Tools: Enables understanding of student queries phrased in natural language for accurate response generation.</p> <p>Performance Requirements</p> <p>VSSA shall respond</p>
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		<ul style="list-style-type: none"> Knowledge Base: Comprehensive database containing university policies, procedures, resources, and course information (regularly updated). Integration with the Student Information Database for personalized course and academic data access (secure and authorized). Natural Language Processing (NLP): Ability to understand and interpret student queries phrased in natural language. Machine learning capabilities to learn from interactions and improve response accuracy over time. Recommendation Engine: Analyze student data (interests, goals, academic performance) to offer personalized recommendations for courses, resources, and support services. Integration Capabilities: Secure interface to connect with the Student Information Database for real-time access to course schedules, grades, and appointments. Ability to schedule appointments with university services (advisors, counselors) through existing university systems. 	<p>to student queries within a few seconds to maintain a smooth user experience. Data retrieval from the knowledge base and Student Information Database should be optimized for minimal response times.</p> <p>Caching mechanisms can be implemented to improve response speed for frequently accessed information.</p> <p>Security Requirements</p> <p>VSSA shall enforce secure user authentication using strong passwords or multi-factor authentication.</p> <p>All student data, including grades, transcripts, and personal information, should be encrypted at rest and in transit.</p> <p>VSSA shall comply with data privacy regulations set forth by the university and relevant governing bodies.</p>
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		<ul style="list-style-type: none"> • Multi-Channel Access: User-friendly mobile app with functionalities for accessing information, scheduling, and communication. Chat interface embedded within the university website or learning management system. Voice assistant functionality for hands-free interaction. • Security and Privacy: Secure user authentication and data encryption to protect student information. Compliance with relevant data privacy regulations. <p>Functional Requirements:</p> <p>Information Access:</p> <p>Detailed Example: A student asks, "What are the office hours for Professor Lee for my Biology 101 class?" VSSA retrieves the student's course schedule (integrated with Student Information Database) and displays Professor Lee's office hours for that specific course section. Additionally, VSSA can provide a map or directions to the professor's office location.</p> <p>Personalized Guidance:</p> <p>Detailed Example: A student inquires, "I'm struggling with calculus, can you recommend any resources to help me improve?" VSSA analyzes the</p>	<p>Domain Requirements</p> <p>Existing Resources and Support Services: VSSA should complement existing university resources, not replace them. It can act as a first point of contact and direct students to the appropriate department or service provider for more complex needs.</p> <p>Student Data Privacy Regulations: VSSA must comply with all university data privacy regulations and relevant laws. Student data should be anonymized or pseudonymized where possible, and access should be restricted based on user roles and permissions.</p> <p>Diverse Student Body: VSSA should cater to a diverse student body. This may involve offering multi-language support and tailoring responses to different learning styles. Additionally, VSSA should be accessible to students with disabilities</p>
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		<p>student's academic history (grades, past performance in math courses) and recommends personalized resources like online tutorials, on-campus tutoring services, or specific textbook chapters to focus on.</p> <p>Support Services: Detailed Example: A student asks, "I'm feeling overwhelmed with my workload, can you connect me with someone who can help?" VSSA identifies the student's academic program and suggests relevant support services based on their needs. Examples include connecting them with an academic advisor, recommending time management workshops, or providing contact information for the university's counseling center.</p> <p>Interaction: Detailed Example: A student types, "Hey VSSA, what clubs can I join that are related to computer science?" VSSA understands the student's informal language and retrieves information about student organizations related to computer science from the university database. VSSA can then provide a list of relevant clubs with brief descriptions and links to their websites or social media pages.</p> <p>Non-Functional Requirements:</p> <p>Usability: Detailed Example: The VSSA mobile app and web</p>	<p>(considerations for screen readers, text size adjustments).</p>
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		<p>interface should be designed with a clean and intuitive layout. Functionality should be easy to discover, and menus or search options should be clear and concise. Tutorials or help guides can be integrated within the VSSA to assist students who need additional guidance.</p> <p>Accessibility: Detailed Example: VSSA should be compatible with screen reader software for visually impaired students. Text size and color options should be available for customization based on individual needs. Additionally, VSSA can offer text-to-speech functionality for students who prefer audio information delivery.</p> <p>Availability: Detailed Example: VSSA should be accessible 24/7 through a user-friendly mobile app available on various platforms (Android, iOS). Additionally, a web interface version should be accessible through any web browser, allowing students to access VSSA from their laptops or desktops.</p> <p>Performance: Detailed Example: VSSA should respond to student queries within a few seconds to maintain a smooth user experience. Data retrieval from the knowledge base and Student Information Database should be optimized to minimize response times. Caching mechanisms can be implemented to improve response speed for frequently accessed information.</p> <p>Security:</p>	
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		<p>Detailed Example: VSSA should enforce secure user authentication using strong passwords or multi-factor authentication. All student data, including grades, transcripts, and personal information, should be encrypted at rest and in transit. VSSA should comply with data privacy regulations set forth by the university and relevant governing bodies.</p>	
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