[Indy-1] - Next Mission Navigator

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Software Requirements Specification

for

NextMission Navigator

Version 1.0 approved

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version

List of Figures

List of Tables

1 Introduction

1.1 Purpose

This Software Requirements Specification (SRS) defines the functional and nonfunctional requirements for the NextMission Navigator system.

NextMission Navigator is a web based artificial intelligence decision support platform designed to assist United States military veterans transitioning to civilian life. The system generates structured, personalized action plans based on a veteran's stated goals, military background, and geographic location. It integrates a large language model with curated, region specific veteran resource datasets to deliver contextually grounded guidance.

This document establishes the required system behavior, architectural constraints, and performance expectations necessary to support development, validation, academic evaluation, and future enhancement. The requirements defined herein serve as the baseline for implementation and verification.

1.2 Document Conventions

This document follows IEEE SRS formatting conventions.

Functional requirements are labeled using the format:

FR X.Y.Z

Nonfunctional requirements are labeled using the format:

NFR X.Y.Z

The term "shall" indicates a mandatory requirement. The term "may" indicates an optional or future enhancement.

All requirement identifiers are unique and traceable to defined system features.

1.3 Definitions, Acronyms, and Abbreviations

Table 1-1: Acronyms

Acronym	Definition
AI	Artificial Intelligence
API	Application Programming Interface
HTTPS	Hypertext Transfer Protocol Secure
LLM	Large Language Model
SRS	Software Requirements Specification
TLS	Transport Layer Security
VA	United States Department of Veterans Affairs
JSON	JavaScript Object Notation
UI	User Interface

Table 1-2: Glossary of Terms

Term	Definition
Action Plan	A structured, prioritized roadmap generated by the system to guide a veteran toward a defined goal.
Intelligence Engine	The subsystem responsible for structured AI based action plan generation and schema validation.
Regional Resource Dataset	A curated, geographically indexed collection of verified veteran support services.
Retrieval Augmented Generation	An architecture in which curated external data is dynamically incorporated into model prompts to constrain and improve generated responses.
Schema Validation	The process of validating structured AI output against a predefined data model.
Voice Integration	The optional subsystem enabling text to speech narration of generated action plans
Interaction Interface Layer	The frontend presentation layer responsible for user input and display of structured output.

1.4 Product Scope

NextMission Navigator is a web-based decision support platform that assists military veterans during their transition to civilian life. The system generates structured, step-by-step action plans tailored to individual goals such as career transition, education planning, housing acquisition, or benefits navigation.

The platform integrates a large language model with curated regional knowledge bases organized by military base area and metropolitan proximity. Through a retrieval augmented generation architecture, validated regional datasets are incorporated into model prompts to ensure location specific and resource grounded recommendations.

The system is intended to reduce information overload, improve access to verified support services, and provide structured, actionable transition roadmaps. The long-term vision includes geographic expansion, optional voice interaction capabilities, persistent user accounts, and deployment as a secure publicly accessible web application.

1.5 References

IEEE Standard for Software Requirements Specifications
Course provided IEEE SRS examples

2. Overall Description

2.1 Product Perspective

NextMission Navigator is a standalone web-based software system deployed within a secure cloud hosted environment. The system functions as an intelligent application layer that integrates a large language model with a structured and curated knowledge base of verified veteran specific resources. It is accessible through modern web browsers on desktop and mobile devices without requiring local installation.

The platform follows a client server architecture. The front end user interface communicates with a backend application programming interface responsible for request validation, schema enforcement, prompt construction, model orchestration, and structured response generation. The backend integrates with a third-party large language model provider for natural language reasoning while enforcing deterministic output constraints through structured schema validation.

The system employs a retrieval augmented generation architecture in which curated regional resource datasets are dynamically incorporated into model prompts prior to generation. These geographically indexed datasets, organized by military base area and metropolitan region, constrain and ground model responses to verified data sources. This design reduces reliance on generalized model output and mitigates hallucination risk by ensuring that generated action plans are informed by validated, location specific resources.

All model responses are required to conform to a predefined structured schema before being returned to the client interface. Invalid or non-conforming outputs are rejected and handled through controlled error management procedures. This validation layer ensures predictable system behavior and maintains structural integrity of generated action plans.

Optional voice interaction capabilities may be integrated through a third-party voice synthesis provider, enabling secure audio narration of generated action plans. Future enhancements may include persistent user accounts, session tracking, database storage for saved plans, and expanded geographic coverage while preserving compatibility with the existing modular architecture.

2.2 Product Functions

NextMission Navigator provides structured transition planning support for United States military veterans. Users enter a defined transition goal and optional contextual data such as geographic location or service background.

Upon submission, the backend validates input parameters and constructs a prompt incorporating user context and relevant regional resource constraints. The large language model generates a structured JSON response representing an action plan. This output is validated against a predefined schema prior to presentation.

Each action plan includes:

- A goal statement
- Prioritized steps
- Step titles and actionable descriptions
- Category classifications
- Metadata such as timestamps and status indicators

When regional datasets are available, the system incorporates location specific veteran resources into the generated plan. This approach emphasizes locally relevant recommendations over generalized advice.

The system renders the validated action plan through a structured user interface that displays step sequencing, priority indicators, and category labels. Optional voice narration may be provided when enabled.

2.3 User Classes and Characteristics

The primary user class consists of United States military veterans transitioning from active duty service to civilian life. Users may vary in age, technical literacy, service branch, geographic location, and career objectives. Many users may be navigating federal and state systems for the first time, including VA benefits, education programs, housing loans, and workforce development pathways.

Secondary users may include transitioning service members preparing for separation, military spouses assisting with planning, and workforce support coordinators using the platform as a guidance tool.

The system is designed with accessibility and clarity as primary considerations. Users are not expected to possess technical knowledge of artificial intelligence systems. The interface emphasizes structured presentation, plain language guidance, and clearly categorized steps. Voice capabilities are intended to support users who prefer auditory interaction or experience cognitive load during planning.

2.4 Operating Environment

NextMission Navigator operates as a web-based application accessible through modern internet browsers. The system is designed to function on desktop and mobile devices using current versions of major browsers including Chrome, Safari, Edge, and Firefox. The application is responsive and optimized for standard screen resolutions commonly used on laptops, tablets, and smartphones.

The backend environment operates within a cloud hosted infrastructure using a server-side runtime environment capable of handling asynchronous API calls, schema validation, and structured data processing. The system integrates with an external large language model service through secure HTTPS requests. Communication between the client interface and backend API occurs over encrypted connections to ensure data integrity and confidentiality.

The system may integrate with a third-party voice synthesis provider to enable audio narration of generated action plans. This integration requires outbound network connectivity and secure API authentication keys stored within environment variables. The platform does not require local installation and does not depend on specialized hardware beyond standard internet-enabled devices.

The system is designed to scale horizontally within a cloud deployment environment and can be hosted on a secure domain with SSL encryption. Future expansion may include database storage for persistent user accounts, session management, and region-specific resource indexing.

2.5 Design and Implementation Constraints

NextMission Navigator is subject to several technical and operational constraints. The system depends on third party large language model services for natural language reasoning and structured response generation. As a result, availability, rate limits, and pricing models imposed by the external provider may affect system performance and scalability.

The system must enforce strict schema validation to ensure that all AI generated outputs conform to a predefined structured format. This requirement constrains prompt design and backend validation logic. Any deviation from the expected structured JSON format must be handled through error management and response validation procedures.

Security considerations impose additional constraints on implementation. API keys for language model services and voice synthesis providers must be stored securely using environment variables and must not be exposed to the client side. All communication between client and server must occur over encrypted HTTPS connections.

The system is also constrained by the need to maintain accuracy and relevance of curated veteran resource data. Geographic resource indexing must be manually curated and validated to ensure reliability. Expanding coverage to additional military base regions requires additional research, verification, and data structuring processes.

Regulatory and ethical considerations further constrain system behavior. The platform must avoid presenting itself as legal, medical, or financial advice. Generated outputs must remain informational and guidance oriented rather than authoritative decision-making tools.

Future design expansions, including persistent user accounts, database storage, and voice interaction enhancements, must maintain compatibility with the existing architecture and schema validation framework.

2.6 User Documentation

NextMission Navigator will include user facing documentation embedded within the web interface. The primary form of documentation will consist of contextual guidance displayed on the launch page, including example goals and descriptive prompts that help users understand how to interact with the system. Instructional text will clarify that more specific goals produce more personalized action plans.

A dedicated informational page will describe the purpose of the system, how action plans are generated, and how curated regional resources are incorporated into AI responses. This documentation will emphasize that the system provides guidance and structured planning support rather than professional legal, medical, or financial advice.

If user accounts are implemented in future versions, additional documentation will include account creation instructions, password recovery procedures, and privacy disclosures. When voice interaction functionality is enabled, documentation will describe how to activate audio playback and explain any data handling associated with voice processing services.

All documentation will be written in clear, accessible language to accommodate veterans from diverse educational and technical backgrounds.

2.7 Assumptions and Dependencies

The system assumes that users have reliable internet access and are able to access modern web browsers. It assumes that users will provide accurate and sufficient information regarding their goals, location, and service background in order to generate relevant guidance.

The platform depends on the availability and reliability of an external large language model service for structured action plan generation. It also depends on secure integration with a third party voice synthesis provider when voice functionality is enabled. Interruptions in external service availability may temporarily limit system functionality.

The system assumes continued access to curated regional veteran resource data that has been verified for accuracy. Expansion into additional military base regions assumes ongoing research and maintenance of localized resource datasets.

It is also assumed that deployment infrastructure will support secure HTTPS connections and appropriate environmental configuration for API keys and service credentials.

3. External Interface Requirements

This section describes the functional and non-functional requirements of NextMission Navigator. These requirements define the behaviors and constraints that the system must satisfy.

3.1 User Interfaces

NextMission Navigator provides a web based graphical user interface accessible through modern browsers on desktop and mobile devices. The primary interface consists of a launch page where users enter a transition goal and optionally provide contextual data such as military branch, years of service, and geographic location.

The user interface shall follow a clean, structured layout emphasizing clarity and minimal cognitive overload. The launch page shall contain a clearly labeled text input field for goal entry and a submission control to initiate action plan generation. The interface shall display a visual loading indicator while the system processes the request.

Generated action plans shall be rendered as structured step cards. Each card shall display a step title, description, category label, and priority indicator. Categories shall be visually differentiated to distinguish planning, resources, and execution phases. The interface shall maintain consistency in typography, spacing, and layout across pages.

Error messages shall be displayed in a clear, non-technical format. The system shall provide feedback for invalid or empty inputs. Future versions may include a help function accessible from all pages and contextual tooltips describing input fields.

Detailed visual layout specifications and design mockups shall be documented separately in the Software Design Document.

3.2 Hardware Interfaces

NextMission Navigator does not require specialized hardware components. The system shall operate on standard computing devices capable of running modern web browsers. These devices include desktop computers, laptops, tablets, and smartphones.

If voice functionality is enabled, the system may interact with microphone and speaker hardware through browser level permissions. Microphone input shall be processed through standard browser APIs and transmitted securely to backend services when voice input is active. Audio playback shall occur through device speakers or headphones using standard web audio capabilities.

No proprietary hardware interfaces are required.

3.3 Software Interfaces

NextMission Navigator interfaces with several external software components.

The system integrates with a large language model API service for structured action plan generation. The interface between the system and the language model service shall use HTTPS requests with JSON formatted payloads. Requests shall include user goal data and contextual information. Responses shall return structured JSON objects that conform to a predefined schema.

The system integrates with a voice synthesis service for optional audio playback. Text content from validated action plans shall be transmitted to the voice API and returned as audio data for playback in the client interface.

The system operates within a Node.js runtime environment and uses a schema validation library to enforce structured output constraints. All data exchanged between the frontend and backend shall be transmitted in JSON format.

No shared memory mechanisms or global data areas are required. All data exchanges shall occur through defined API request and response channels.

3.4 Communications Interfaces

The system shall use HTTPS as the primary communication protocol for all client server and external API interactions. All communication shall occur over encrypted TLS connections to protect data in transit.

Data exchanged between components shall be formatted in JSON. Requests to external AI services shall include structured prompt content and configuration parameters. Responses shall return JSON objects containing structured action plan data.

If voice interaction is enabled, audio data shall be transmitted using secure HTTPS connections and streamed or downloaded according to the capabilities of the voice service provider.

The system shall not use email, FTP, or other legacy communication protocols. All communication shall conform to standard web based RESTful service conventions.

4. System Features

In this section, each internal subsystem of NextMission Navigator is described including its purpose, implementation priority, classification, and associated functional requirements. The system is organized into logical subsystems that separate intelligence processing, knowledge management, regional contextualization, user interaction, and voice communication.

Each subsystem is classified as Required or Optional based on its necessity for minimum viable deployment. All Required subsystems must be implemented for a compliant production release. Optional subsystems may be introduced in phased releases.

The subsystem hierarchy for NextMission Navigator is summarized below.

- Intelligence Engine [Required]
- Knowledge Curation Layer [Required]
    - Regional Resource Manager [Required]
- Interaction Interface Layer [Required]
- Voice Interaction Module [Optional Phase I, Required Phase II]

4.1 Intelligence Engine

The Intelligence Engine is responsible for generating personalized, structured action plans based on a user's stated goal, military background, geographic location, and intended career or life objective. The subsystem integrates a large language model with system-level validation logic to ensure that generated outputs conform to predefined structural requirements. The Intelligence Engine acts as the core analytical component of NextMission Navigator, transforming user inputs into step-by-step, categorized transition roadmaps that are both actionable and regionally contextualized.

4.1.1 Priority

The Intelligence Engine is of High priority to NextMission Navigator because it serves as the primary mechanism for delivering value to the user. Without this subsystem, the platform cannot fulfill its central function of producing personalized transition guidance.

4.1.2 Stimulus/Response Sequences

TWhen a user submits a goal through the user interface, the system shall invoke the Intelligence Engine. The subsystem shall validate the input parameters and initiate a structured generation request to the integrated language model. Upon receiving a response, the system shall validate the structure of the output against the defined schema. If the output satisfies structural validation, the formatted action plan shall be returned to the Interaction Interface Layer for presentation to the user. If validation fails, the system shall generate an error response and notify the user of generation failure.

4.1.3 Functional Requirements

Table 4-1 Functional Requirements

Requirement ID	Description
REQ-IE-1.1	The Intelligence Engine shall accept structured input parameters including goal, military branch, years of service, and geographic location.
REQ-IE-1.2	The Intelligence Engine shall generate a structured action plan consisting of a goal field, timestamp, prioritized steps, categorized step types, and status indicator.
REQ-IE-1.3	The Intelligence Engine shall validate all generated output against the defined Action Plan schema prior to returning results.
REQ-IE-1.4	The system shall reject any output that does not conform to schema validation rules.
REQ-IE-1.5	The subsystem shall return validated structured data to the Interaction Interface Layer for rendering.

4.2 Regional Resource Integration

The Regional Resource Integration subsystem manages structured, geographically indexed datasets containing verified veteran support services. These datasets are organized by metropolitan region and military base proximity to ensure contextual relevance. The subsystem associates user location metadata with the appropriate regional dataset and supplies validated resource information to the Intelligence Engine during plan generation.

This subsystem is classified as High Priority for production deployment because it enables contextualized guidance and reduces reliance on generalized model output.

4.2.1 Priority

The Regional Resource Integration subsystem is of High priority because it provides the contextual data foundation required for location specific transition guidance. Without this subsystem, the Intelligence Engine would rely solely on generalized model knowledge, reducing the accuracy and practical applicability of generated action plans. By ensuring that verified regional resources are incorporated into the generation workflow, this subsystem directly supports the system's objective of delivering personalized, actionable guidance to veterans based on geographic relevance.

4.2.2 Stimulus and Response Sequences

When a user submits or selects geographic location information through the Interaction Interface Layer, the system shall determine the associated regional classification based on predefined mapping rules. The Regional Resource Integration subsystem shall retrieve the structured dataset corresponding to the identified metropolitan region or military base area.

The subsystem shall validate the integrity and availability of the regional dataset prior to use. If a valid dataset is available, the system shall inject the curated regional resource information into the Intelligence Engine prompt context prior to generation. The Intelligence Engine shall then produce a location aware action plan that incorporates verified regional resources.

If no regional dataset is available for the provided location, the system shall default to a generalized resource generation mode and shall log the absence of regional data for administrative review.

4.2.3 Functional Requirements

The functional requirements for the Regional Resource Integration subsystem are shown in Table 4-2.

Table 4-2 Regional Resource Functional Requirements

Requirement ID	Description
REQ-RRI-1.1	The subsystem shall maintain structured regional resource datasets indexed by geographic region and military base area.
REQ-RRI-1.2	The subsystem shall map user provided location metadata to a defined regional classification.
REQ-RRI-1.3	The subsystem shall validate dataset availability and structural integrity prior to integration with the Intelligence Engine.
REQ-RRI-1.4	The subsystem shall inject validated regional resource data into the generation context of the Intelligence Engine.
REQ-RRI-1.5	The subsystem shall support the addition of new regional datasets without modification to the core Intelligence Engine logic.
REQ-RRI-1.6	The subsystem shall log cases where no regional dataset exists for a given location input.

4.3 Voice Integration

The Voice Interaction Module provides optional audio narration of generated action plans through integration with an external text-to-speech service. This subsystem converts structured textual action plan content into synthesized speech and delivers playback within the web interface.

The module is architected as a loosely coupled external integration to preserve separation between core generation logic and presentation enhancements. It does not participate in action plan generation or validation, but operates exclusively on finalized, validated output provided by the Intelligence Engine.

4.3.1 Priority

The Voice Interaction Module is classified as Medium Priority. While it enhances accessibility and user engagement, it is not required for core system functionality. The platform must remain fully operational for users who do not utilize audio playback features.

4.3.2 Stimulus and Response Sequences

When a user selects the audio playback option after an action plan has been rendered, the system shall invoke the Voice Interaction Module.

The module shall extract validated textual content from the generated action plan and transmit it securely to the configured text-to-speech service provider.

Upon receipt of synthesized audio data, the system shall return the audio stream to the browser client and initiate playback through the user interface.

If the voice service fails to respond or returns an error, the system shall notify the user and preserve full access to the textual action plan without interruption.

4.3.3 Functional Requirements

The functional requirements for the Voice Interaction Module are defined in Table 4-3.

Table 4-3 Voice Integration Module Functional Requirements

Requirement ID	Description
REQ-VIM-1.1	The system shall support conversion of validated action plan text into synthesized speech using an external text-to-speech service.
REQ-VIM-1.2	The system shall allow users to initiate, pause, and stop audio playback within the web interface.
REQ-VIM-1.3	The system shall ensure secure transmission of text data to the external voice synthesis provider using encrypted HTTPS communication.
REQ-VIM-1.4	The system shall handle service unavailability gracefully and notify the user of playback failure without impacting core functionality.
REQ-VIM-1.5	The subsystem shall remain logically decoupled from the Intelligence Engine to prevent voice integration changes from affecting core plan generation logic.

5 Other Nonfunctional Requirements

This section describes the other nonfunctional requirements of NextMission Navigator. These requirements describe the performance, safety, security, quality, and operational constraints under which the system must operate. Unlike functional requirements, these attributes define how the system performs rather than what services it provides.

5.1 Performance Requirements

The performance requirements for NextMission Navigator are defined in Table 5.1.

Table 5-1 Performance Requirements

Requirement ID	Description
REQ-PRF-1.1	The system shall generate a structured action plan within 10 seconds under normal operating conditions for a single user request.
REQ-PRF-1.2	The system shall maintain stable response times under moderate concurrent usage typical of small-scale public deployment.
REQ-PRF-1.3	The system shall gracefully handle external API latency or failure without crashing or exposing system errors to the user.
REQ-PRF-1.4	The system architecture shall support horizontal scalability through stateless API design.

5.2 Safety Requirements

NextMission Navigator shall function as an informational planning support tool only and shall not represent itself as legal, medical, financial, or official government advice. The system shall not generate instructions that could reasonably cause physical harm or financial loss. Users shall be encouraged to verify critical information through authoritative external sources. Where appropriate, the system shall include disclaimers clarifying its advisory role.

5.3 Security Requirements

The security requirements for NextMission Navigator are defined in Table 5.2.

Table 5-2 Security Requirements

Requirement ID	Description
REQ-SEC-1.1	The system shall store API credentials exclusively in secure server-side environment configurations.
REQ-SEC-1.2	The system shall not expose sensitive keys or tokens in client-side code.
REQ-SEC-1.3	All communications between client, server, and external APIs shall use encrypted HTTPS connections.
REQ-SEC-1.4	The system architecture shall support future implementation of secure user authentication and role-based authorization.

5.4 Software Quality Attributes

NextMission Navigator shall prioritize reliability and correctness of structured output generation. Maintainability shall be supported through modular architecture separating frontend presentation, API routing, engine logic, and schema validation layers. Scalability shall be supported through stateless API design and cloud deployment readiness. Usability shall prioritize clarity, structured presentation, and minimal cognitive load for transitioning veterans.

5.5 Business Rules

NextMission Navigator shall operate as an informational transition planning support tool for veterans. The system shall not replace official government services, licensed professionals, or certified advisors. Regional resource datasets shall be verified prior to inclusion in the knowledge base. Only authorized administrators shall be permitted to modify curated resource data.

6 Other Requirements

NextMission Navigator shall support deployment on a secure domain utilizing SSL encryption. The system architecture shall be compatible with cloud-based hosting environments and scalable deployment models.

Future versions of the system may incorporate persistent database storage to support user accounts, saved action plans, and administrative resource management. The architecture shall maintain forward compatibility with potential expansion into nonprofit, workforce development, or federal contract deployment environments without requiring fundamental redesign of the core system.

Appendix A: Analysis Models

This appendix may include system architecture diagrams, data flow diagrams, and class diagrams illustrating the relationship between the frontend, API layer, engine layer, schema validation layer, and external services.

Appendix C: To Be Determined List

TBD 1: Full geographic coverage expansion timeline.
TBD 2: Persistent user account implementation.
TBD 3: Database storage design for saved action plans.