Theia Team

Revised Project Management Plan

Phase I & II

The Team:

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11/8/25

Revision History

Responsible Party	Date	Reason For Changes	Version
Chandler, Erik, Julian, Logan, Matthew, Yaru	09/14/25	Initial draft	0.0.1d-14SEP25
Chandler	09/24/25	- Project Organization Section Revision - Responsibilities Revised	0.0.2d-24SEP25
Matthew	10/6/25	Project Overview Revision	0.0.3d-6OCT25
Matthew	10/12/25	Final Phase I submission editing	0.0.4d-12OCT25
Julian	11/08/25	Final Project Plan revisions	0.05d-08NOV25

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I. Introduction

I.i. Project Overview

The goal of this course project is to illustrate the development process by creating a hypothetical mobile application to allow blind and visually impaired users to safely navigate indoor public areas. Through the theoretical progress of this system, the team will demonstrate their abilities to create a well-structured project management plan using techniques to professionally elicit requirements from clients and stakeholders. Our focus is to develop skills related to requirements elicitation, specification, analysis, and validation to gain an understanding of the requirements engineering process.

Phase II Updates:
Phase II introduces advanced requirements engineering techniques using semi-formal notations with richer ontologies. The team will conduct a second round of elicitation, analysis, specification, and validation using KAOS models for goal-oriented requirements engineering and IDEF0 for process modeling. Additionally, Phase II requires addressing new system aspects including:

- Safety considerations

- Technical feasibility analysis

- Maximal utilization of smartphone sensors (accelerometer, camera, microphone, etc.)

- HIPAA compliance and privacy regulations

- Development of a functional prototype

As this project is meant for academic purposes, there will be no budget provided; however, our team will instead make use of student-provided resources, licenses, and open-source tools. This also means that any clients and stakeholders involved in this project will be roles assumed by our team.

Major work activities now include the following:

Phase I Activities (Completed):

- Development of AS-IS/TO-BE scenarios for Project Phase I presentation

- Initial WRS document with preliminary requirements

- Creation of mockup designs using Figma

- Preliminary requirements analysis

Phase II Activities (In Progress):

- KAOS model development (Goal, Responsibility, and Obstacle models)

- IDEF0 process specification modeling

- Vision & Scope document creation

- WRS revision incorporating KAOS models and new requirements

- Functional prototype development

- Updated AS-IS/TO-BE scenarios

- User manual refinement

Major milestones include the following:

- **Project Phase I:** Preliminary Project Plan (Sept 14, 2025) - Completed

- **Project Phase I:** Final Submission/Presentation (Oct 12, 2025) - Completed

- **Project Phase II:** Prototype and User Manual (Nov 9, 2025)

- **Project Phase II:** Refined Prototype with Expanded Features (Nov 23, 2025)

- **Project Phase II:** Final Submission/Presentation (Dec 7, 2025)

Required resources include the following:

- Shared GitHub repository for collaboration and version control

- Discord for file sharing, discussing deadlines, planning meetings, etc.

- Software/UI development tools for creation of mobile application prototype

- **NEW:** KAOS modeling tool (Objectiver trial version recommended)

- **NEW:** IDEF0 modeling tool for process specification

- **NEW:** Development environment (Android Studio or XCode) for functional prototype

The official statement of product requirements for this project is provided in the course materials, with Phase II specifications detailed in "Cpt S 484-Project Specification II-v1.0.docx".

I.ii. Project Deliverables

Deliverable	Delivery Date	Delivery Location	Quantity
Project Phase I: Preliminary Project Plan	9/14/25	Canvas and GitHub	Preliminary plan
Project Phase I: Final Submission/Presentation	10/12/25	Canvas and GitHub	Phase I documents, meeting records, PowerPoint slides
Project Phase I: Peer Review	10/12/25	Canvas	Form
Revised AS-IS/TO-BE Presentation	10/31/25	Canvas and GitHub	Updated scenarios
Vision & Scope Document	11/9/25	Canvas and GitHub	Complete vision document
Process Specification (IDEF0)	11/9/25	Canvas and GitHub	IDEF0 models with context
Revised WRS with KAOS Models	11/9/25	Canvas and GitHub	Updated WRS document
Prototype and User Manual	11/9/25	GitHub	Prototype, user manual
Refined Prototype w/ Expanded Features and Updated Documentation	11/23/25	GitHub	Refined prototype, updated documentation
Final Integrated Prototype, Project Phase II Submission	12/7/25	Canvas and GitHub	Final prototype, Phase II documents
Final Project Submission/Presentation	12/7/25	Canvas and GitHub	Final project documents

I.iii. Evolution of the PPMP

This PPMP was drafted at the start of Project Phase I and has been collaboratively maintained via Google Docs. Its contents consist of the team's initial plans and agreements for this project, now updated to reflect Phase II requirements and activities.

Scheduled updates occur after team review and approval, while unscheduled updates are proposed during Discord communications (messaging or voice channel) and adopted after team review and approval.

Phase II Updates:
The plan has been revised to incorporate:

- New deliverables (Vision Document, Process Specification, KAOS models)

- Updated responsibilities for semi-formal modeling tasks

- Revised timeline reflecting Phase II milestones

- New tools and techniques (KAOS, IDEF0)

- Functional prototype development requirements

The completion of this project continues to happen incrementally and is shared with all members of the team. Project updates are communicated during weekly team meetings and proper documentation in GitHub.

Updates and changes are traced via the team's recorded version control and GitHub uploads. A finalized version of this document will be submitted to Canvas for the end of Phase II.

I.iiii. Reference Material

Karl Wiegers and Seilvel, "Good practices for requirements engineering," in Software Requirements, 3rd ed. Redmond, WA, USA: Microsoft Press, 2013, ch. 3, pp. 44-56.

Karl Wiegers and Seilvel, "Requirements Management Practices," in Software Requirements, 3rd ed. Redmond, WA, USA: Microsoft Press, 2013, ch. 27, pp. 468-469.

Karl Wiegers and Seilvel, "Glossary," in Software Requirements, 3rd ed. Redmond, WA, USA: Microsoft Press, 2013, pp. 597, 600, 602-603.

Frequency Response and Bias, NERC Reliability Standard BAL-003-0.1b, May 2009. [Online]. Available: http://www.nerc.com/files/BAL-003-0_1b.pd

KAOS Tutorial, Chapter 3 (Goal, Responsibility, Object, and Operation Models)

Lesson 8: KAOS Modeling Techniques

Lesson 9: IDEF0 Process Modeling

I.v. Definitions and Acronyms

- **Agile:** A term used for software development methods characterized by continuous collaboration between developers and customers, limited documentation of requirements in the form of user stories and corresponding acceptance tests, and rapid and frequent delivery of small increments of useful functionality.

- **Backlog (Kanban):** Prioritized list of work remaining for the project. It can contain user stories, business processes, change requests, infrastructure development, and defect stories.

- **GPS:** Global Positioning System.

- **HIPAA:** Health Insurance Portability and Accountability Act - regulations governing the privacy and security of health information.

- **IDEF0:** Integration Definition for Function Modeling - a method for creating functional models that capture the decisions, actions, and activities of an organization or system.

- **IoT:** Internet of Things - network of physical devices embedded with sensors, software, and connectivity.

- **KAOS:** Knowledge Acquisition in Automated Specification - a goal-oriented requirements engineering methodology.

- **LLM:** Large Language Model - AI system used for object detection and scene recognition.

- **Objectiver:** Professional tool for creating KAOS models (trial version available).

- **PPMP:** Preliminary Project Management Plan.

- **Sprint:** An uninterrupted development period, typically one to four weeks in duration.

- **SRS:** Software Requirements Specification - a collection of the functional and non-functional requirements for a software product.

- **Story Point:** Total is proportional to the amount of effort the team must expend to implement the requirements.

- **User Story:** A format to capture user requirements on agile projects in the form of one or two sentences.

- **Use Case:** A description of a set of logically related possible interactions between an actor and a system.

- **WRS:** Written Requirements Specification.

II. Project Organization

II.i. Process Model

To complete the documentation and partial parts of the programming side, the life cycle we have chosen is agile as it specializes in flexibility and collaboration within our team, especially as we must act as different stakeholders along with the business analyst.

Everything will be done in sprints as an incremental and iterative process for elicitation, analysis, specification, validation, requirements management, and project management.

Phase II Process Updates:

Phase II follows an enhanced agile approach incorporating:

- **Goal-Oriented Requirements Engineering (GORE):** Using KAOS methodology to model goals, obstacles, responsibilities, and operations

- **Functional Process Modeling:** Using IDEF0 to document the team's RE activities

- **Iterative Refinement:** Second round of requirements elicitation with richer, semi-formal notations

- **Prototype-Driven Development:** Building functional prototypes to validate requirements

The sprint will go through a rotation of planning, design, development, deployment, and review. Some of these steps may be revisited during other parts of the sprint. For Phase II, we are conducting our second major sprint focusing on advanced modeling and prototype development.

II.ii. Organizational Structure

Our team responsible for all steps of the agile life cycle is called the Theia Team. The members are as follows: Chandler Guthrie, Erik Winiski, Julian Hutchins, Logan Cribbs, Matthew Hill, and Yaru Gao. Matthew Hill will be the liaison of Theia Team.

All members will be involved in every part of the project, including:

- Documentation (WRS, Vision Document, Process Specification)

- KAOS modeling (Goal, Responsibility, Obstacle models)

- IDEF0 process modeling

- Design and development of the functional application prototype

- User manual development

All reviews will be taken by our team, Theia Team, with ourselves acting as the client/stakeholders of the application.

II.iii. Organizational Boundaries and Interfaces

All parties of the Theia Team and our mentor will be communicating through the chosen liaison. The main form of contact between them will be by email, with the possibility of

meetings on Zoom for clarification. Each member of Theia Team will be using platforms such as Discord and email for communication and constant collaboration, and other tools which are discussed in depth in Methods, Tools, and Techniques.

Phase II Communication Updates:

- Increased frequency of check-ins due to modeling and prototype development

- Use of shared modeling tools (Objectiver, IDEF0 software)

- Regular prototype demonstrations during team meetings

- Document collaboration via Google Docs for Vision and Process Specification

II.iiii. Project Responsibilities

Due to the nature of this project and the scope, many of the responsibilities may be shared; however, it is completely possible to begin with claims of ownership of said responsibilities. These people will be responsible for the completion of the task, including giving out possible responsibilities.

Role	Description	Person
Liaison	Communicates with all parties outside Theia, keeping everyone in the know.	Matthew Hill
Project Manager	In charge of communicating responsibilities and keeping track of progress.	Chandler Guthrie

We, the Theia Team, have decided to break down each responsibility in accordance with the agile methodology and good engineering practices for a requirements development process framework.

Phase I Responsibilities (Completed)

Responsibility	Reference	Owner(s)	Count
Introduction to the project	WRS [1], 1, 2, 3, 5	Chandler G.	1
Definitions, Acronyms, Abbreviations, References	WRS[1] 4, WRS [7]	ALL	INF
Preliminary domain, FR, NFR	WRS [2] 1, 2, 3	Julian H.	1
Issues analysis	WRS [3] 1, 2, 3	Julian H., Yaru G., Chandler G.	3
Problems and goals	WRS [4.1] 1,2	Logan C.	1

Improved objectives	WRS [4.1.3] 1,2,3,4	Yaru G., Erik W., Chandler G.	3
System requirements and specifications	WRS [4.2] 1,2,3	Matthew H., Julian H., Logan C	3
Prototypes and user manual	WRS [5]	Yaru G., Chandler G., Matthew H.	3
Mock-up design	WRS[6]	Logan C., Erik W., Julian H.	3
AS-IS TO-BE scenarios	AS-IS TO-BE	Matthew H.	1
Comparison chart	AS-IS TO-BE	Logan C.	1
Meeting records	MEETING RECORDS	Matthew H.	1
Backlog (Kanban)	Management	Erik W.	1

Phase II Responsibilities

Responsibility	Reference	Owner(s)	Due Date	Notes
Final Project Plan Revision	Phase II Spec	ALL	11/9/2025	Update Phase I plan with Phase II activities
WRS Revision	Phase II Spec	ALL	11/9/2025	Incorporate KAOS models, new requirements (Safety, HIPAA, sensors)
KAOS Goal Model	KAOS Tutorial Ch. 3, p. 39	Matthew H.	11/9/2025	Overall, Functional, Non-Functional goal models
KAOS Responsibility Model	KAOS Tutorial Ch. 3, p. 39	Chandler G.	11/9/2025	Automated using Objectiver after goal models
KAOS Obstacle Model	KAOS Tutorial p. 34	Logan C.	11/9/2025	At least one obstacle model
Vision & Scope (1.1-1.4)	Software Req. pp. 83-86	Chandler G.	10/24/2025	Business requirements
Vision & Scope (1.5-1.7)	Software Req. pp. 87-88	Erik W.	11/9/2025	Business requirements continued
Vision & Scope (2.1-2.4)	Software Req. pp. 88-90	Yaru G.	11/9/2025	Scope and limitations

Vision & Scope (3.1-3.3)	Software Req. pp. 90-92	Yaru G.	11/9/2025	Business context
Process Specification I	Lesson 9, IDEF0	Logan C.	11/9/2025	IDEF0 model of team RE process
Process Specification II	Lesson 9, IDEF0	Chandler G.	11/9/2025	IDEF0 model continuation
Process Specification III	Lesson 9, IDEF0	Logan C.	11/9/2025	IDEF0 model finalization
Revised AS-IS TO-BE	Phase II Spec	Chandler G.	10/31/2025	3 scenarios: navigation, caretaker, emergency
Kanban Board	Management	Erik W.	11/9/2025	Based on functionality and roles
Back-end Implementation	Programming	Yaru G., Chandler G., Matthew H.	11/9-12/7/2025	Functionality and business logic
Functional Prototype	Phase II Spec	ALL	11/9-12/7/2025	Must address 3 TO-BE scenarios with working features

III. Managerial Process

III.i. Management Objectives and Priorities

We will break the project into small, trackable tasks and use Discord as our primary channel for posting assignments, updates, and quick questions. Tasks will be assigned in posts or during meetings, and we will rebalance workloads collaboratively if someone needs to switch or trade work.

Phase II Priority Updates:
When trade-offs arise, we will prioritize in the following order:

1. **Phase II deliverable deadlines** (Nov 9, Nov 23, Dec 7)

2. **Required KAOS models** (Goal, Responsibility, Obstacle)

3. **Functional prototype** with working features for 3 TO-BE scenarios

4. **Process Specification** (IDEF0) accurately modeling team activities

5. **Vision Document** completeness

6. **Code quality and reliability** over visual polish

7. **Documentation completeness** before refinement

Specific roles and focus areas have been clarified for Phase II:

- **KAOS Modeling:** Matthew (Goals), Chandler (Responsibilities), Logan (Obstacles)

- **Vision Document:** Chandler (Section 1.1-1.4), Erik (Section 1.5-1.7), Yaru (Sections 2 & 3)

- **Process Specification:** Logan, Chandler (IDEF0 modeling)

- **Prototype Development:** Front-end (Logan lead, Julian, Erik, Yaru support), Back-end (Yaru lead, Chandler, Matthew support)

Team meetings will be held online in the Discord voice channel every Tuesday at 2:00 pm for 1 to 2 hours, with timing adjusted if conflicts arise. Communication with sponsors and mentors will go through the designated liaison, who will serve as the single point of contact and share summaries, decisions, and action items with the entire team to keep everyone aligned.

All deliverables will be stored in the shared GitHub repository; each person will work on a feature branch. When a task is complete, the deliverable will be submitted via pull request. The liaison will then evaluate it against the criteria in the course materials and this plan, and the team will review it in meetings to gather feedback and make revisions. Once the work meets the criteria, it will be merged into the main branch.

Phase II Review Process:

- KAOS models will be peer-reviewed using Objectiver exports

- IDEF0 diagrams will be reviewed for compliance with IDEF0 rules (Lesson 9)

- Prototype will be tested against 3 TO-BE scenarios before each milestone

- Documentation will be reviewed for incorporation of new requirements (Safety, HIPAA, sensors)

III.ii. Assumptions, Dependencies, and Constraints

This section makes our working conditions explicit so that planning and risk management are grounded in reality. Assumptions clarify what we expect to be true inside the team, dependencies identify what we rely on outside the team, and constraints define the non-negotiable limits we must work within.

Assumptions

AS-1: Team members attend scheduled meetings and respond within 24 hours on the primary channel (Discord).

AS-2: Before each weekly meeting, every member has at least some deliverables or a clear progress update ready to share.

AS-3: The team has baseline proficiency with the required tools (programming languages, frameworks, and workflows) to complete the project.

AS-4 : Team members complete the KAOS Tutorial reading assignment (mandatory, 6 points) to understand goal-oriented modeling.

AS-5 : Team members can access and learn trial versions of professional modeling tools (Objectiver, IDEF0 software) within project timeline.

AS-6: Team members can develop functional prototype features even if incomplete, demonstrating "something" for each TO-BE scenario.

Dependencies

DE-1: All team members have read/write access to the GitHub repository.

DE-2: University and course infrastructure (Canvas and Perusall) remains available and functioning.

DE-3: Mentors and sponsors are reachable for questions and provide timely guidance.

DE-4 : IDEF0 modeling tools.

DE-5 :development environments for mobile app testing

DE-6 : Access to KAOS Tutorial and Lesson 8/9 materials for modeling guidance.

Constraints

CO-1: Schedule is fixed, with phase and sprint deadlines set by the syllabus.

CO-2: Staffing is fixed at team size 6, with no additional members.

CO-3: No paid services are permitted; we will use open-source or academic-tier tools only.

CO-4: The technology stack must be suitable for a smartphone app and approved by the course, using frameworks and languages that provide the required device capabilities.

CO-5 : Prototype must be functional (not just UI animation or GUI-only demo) with backend programming completed.

CO-6 : Must include at least Goal and Responsibility KAOS models (Object and Operation models optional).

CO-7 : Must address new system aspects: Safety, Technical feasibility, Sensor utilization, HIPAA compliance.

CO-8 : Process Specification must model team's RE activities, not the app/prototype itself.

CO-9 : No preliminary submission for Phase II Project Plan (unlike Phase I).

III.iii. Risk Management

We will be keeping a log to track potential issues and how likely they are. Additionally, the log will contain our plan to mitigate each specified risk. Risks will be reviewed in weekly team meetings and updated as the project progresses.

No.	Risk	Type	Likelihood	Impact	Mitigation/Response
1	Breakdown of team communication	Managerial	Low	Medium	Schedule regular meetings and check-ins. Use Discord for consistent communication. Document team decisions.
2	Missed or unclear deliverables	Managerial	Medium	High	Set clear deadlines and review all work before submission. Confirm what is expected early.
3	Loss of project files or version control	Technical	Low	High	Use Git for version control, proper branching, and commits. Store all project documents in the shared Google Drive.
4	Uneven distribution of work	Managerial	Low	Medium	Reassign work as needed, and keep a visible tracker of assigned tasks.
5	Loss of engagement from team member(s)	Managerial	Medium	Medium	Have open discussions regarding any issues or worries about the project. Redistribute work if needed and keep the team accountable.
6	Schedule slippage from underestimating tasks	Managerial	Medium	High	Break tasks down into smaller blocks. Track weekly progress, make schedule adjustments early if needed.

7	Difficulty learning KAOS modeling tools	Technical	Medium	High	Complete KAOS Tutorial early. Share knowledge in team meetings. Use Objectiver documentation and course examples.
8	IDEF0 model doesn't meet specification rules	Technical	Medium	Medium	Carefully review Lesson 9 guidelines. Peer review IDEF0 diagrams before finalization. Consult instructor if uncertain.
9	Prototype development falls behind schedule	Technical	High	High	Start prototype early. Focus on core navigation features first. Use iterative development. Accept "somewhat functional" as acceptable per instructor guidance.
10	Misunderstanding new requirements (Safety, HIPAA, sensors)	Requirements	Medium	High	Carefully review Phase II specification. Discuss interpretations in team meetings. Seek instructor clarification early.
11	Tool trial versions expire before completion	Technical	Low	Medium	Download and activate trials strategically. Export models regularly. Have backup tool options identified.
12	Prototype doesn't adequately address TO-BE scenarios	Requirements	Medium	High	Map prototype features to scenarios explicitly. Test against scenarios during development. Document assumptions clearly.

Effort Estimate: We estimate that risk management will take ~5-7% of our project effort for Phase II (roughly 1-1.5 hours per week for check-ins and updates), increased from Phase I due to technical complexity.

III.iiii. Monitoring and Controlling Mechanisms

Progress will be monitored and tracked through our team's weekly check-ins, shared documents, and reports.

Info Communicated	From	To	Frequency
Status Update	Team Members	Project Manager	Weekly
Status Report	Project Manager	Instructor	Weekly
Project Review	Team	Instructor	Bi-weekly

Risk Log Update	Project Manager	Team	Weekly
Urgent Issues	Any Team Member	Team	As Needed
KAOS Model Progress	**Model Owners**	**Team**	**Weekly**
Prototype Demo	**Dev Team**	**All Team**	**Bi-weekly**
Tool/Technical Issues	**Any Member**	**Team**	**As Needed**

Monitoring Tools:

- **Weekly Meetings** - Check task progress, update risk log, adjust schedule or task assignment if needed, review KAOS models and prototype progress.

- **Shared Tools:**

    o Git and GitHub for version control

    o Google Drive for documentation

    o Discord as the main channel of communication

    o **Objectiver for KAOS model collaboration**

    o **IDEF0 tool for process specification**

    o **Android Studio/XCode for prototype development and testing**

- **Peer Review** - Review all project work before submission and make changes if needed. Special attention to:

    o KAOS model correctness (Chapter 3 rules)

    o IDEF0 diagram compliance (Lesson 9 rules)

    o Prototype functionality against TO-BE scenarios

    o Documentation completeness for new requirements

- **Phase II Specific Tracking:**

    o Kanban board on GitHub for task visualization

    o KAOS model completion checklist (Goal, Responsibility, Obstacle)

    o Prototype feature checklist mapped to TO-BE scenarios

    o Document section completion tracking (Vision, Process Spec, WRS revision)

IIII. Technical Process

IIII.i. Methods, Tools, and Techniques

Methods:

Agile Development (Continued from Phase I):
We continue using the Agile development process with 2-3 week sprints that include their own phases of planning, development, testing, deliverables, etc. This allows for prototypes and early versions to be previewed.

Goal-Oriented Requirements Engineering
Phase II introduces KAOS (Knowledge Acquisition in Automated Specification) methodology for:

- Goal modeling (functional and non-functional goals)

- Responsibility assignment to agents

- Obstacle identification and resolution

- Operation and object modeling (optional)

Functional Process Modeling :
Using IDEF0 (Integration Definition for Function Modeling) to:

- Document the team's RE activities throughout Phases I and II

- Model inputs, controls, outputs, and mechanisms (ICOM) of team processes

- Show relationships between Phase I and Phase II activities

User-Centered Design:
Requirements continue to be derived from AS-IS and TO-BE scenarios, with emphasis on features that assist visually impaired users.

Tools:

Phase I Tools:

- Discord for general communication

- Google Docs for commenting on peer-reviewed documents

- GitHub for code hub, version control, and project management

- IDE such as Visual Studio Code for code writing

- Android Studio or XCode for testing environment

- Figma for UI design

Phase II Tools:

- **Objectiver:** Professional tool for creating KAOS models (Goal, Responsibility, Obstacle, Object, Operation models)

- **IDEF0 Modeling Software:** Professional tool for creating IDEF0 process diagrams with proper ICOM notation

- **Mobile Development Environment:** python for functional prototype development

Techniques:

Phase I Techniques :

- Kanban board on GitHub for task distribution

- User stories and scenarios for requirements gathering

Phase II Techniques:

- **KAOS Tutorial Application:** Following Chapter 3 guidelines for building goal models, responsibility models, and obstacle models

- **Page 39 KAOS Tutorial Guidance:** Incorporating models in proper WRS sections

- **IDEF0 Rules Compliance:** Following Lesson 9 specifications for context A-0 diagrams and expansions

- **Requirements Traceability:** Linking KAOS goals to functional/non-functional requirements and prototype features

IIII.ii. Software Documentation

This project's documentation will be produced and updated regularly as the team moves through each sprint.

Phase I Documentation (Completed):

- Vision and Scope document explaining project's broad goals, boundaries, and objectives

- AS-IS and TO-BE scenarios describing navigation challenges and proposed improvements

- Software Requirements Specification (SRS/WRS) outlining functional and non-functional requirements

- Initial user manual with application usage instructions

- Meeting notes and summaries

- Version control records on GitHub

- Mockup designs in Figma

Phase II Documentation:

1. Vision & Scope Document:

Following the Software Requirements textbook template (pages 83-92):

- Section 1: Business Requirements (1.1-1.7)

    - Background, Business Opportunity, Business Objectives and Success Criteria

    - Customer/Market Needs, Business Risks

- Section 2: Scope and Limitations (2.1-2.4)

    - Major Features, Scope of Initial Release, Scope of Subsequent Releases

    - Limitations and Exclusions

- Section 3: Business Context (3.1-3.3)

    - Stakeholder Profiles, Project Priorities, Operating Environment

2. Process Specification:

Using IDEF0 and/or UML diagrams to model:

- All iterations involving modeling and prototyping

- People involved during development

- Relationships between Phase I and Phase II (inputs/outputs)

- Context A-0 diagram with expansions

- ICOM (Input/Control/Output/Mechanism) for each activity

- Accompanying written context explaining IDEF0 models

3. Revised WRS Document:

Updated to incorporate:

- **KAOS Models integrated into appropriate sections:**

- o Goal models in Goals section

- o Responsibility models in Stakeholders/Requirements section

- o Obstacle models showing problem resolution

- o Optional: Object and Operation models

- **New Requirements:**

  - o Safety considerations and risk mitigation

  - o Technical feasibility analysis

  - o HIPAA compliance or disclaimer

  - o Fall detection and medical alarm features

- **Issues Documentation:**

  - o Incompleteness, inconsistency, ambiguity, redundancy identified in Phase II

  - o Options considered, tradeoffs analyzed, decisions made using formal notations

4. Functional Prototype with User Manual:

- Working prototype demonstrating functionality for 3 TO-BE scenarios

- Must include backend programming, not just UI animation

- User manual explaining features and usage

- Demo-ready on mobile device or desktop simulator (XCode/Android Studio)

- Documented assumptions about functionality

5. Final Project Plan (This Document):

- Updated from Phase I to include Phase II activities

- Revised responsibilities, timeline, and deliverables

- No preliminary version required for Phase II

Documentation Standards:

- All documents stored in GitHub repository and Google Drive

- Revisions tracked with version numbers and change logs

- Reviews conducted at weekly meetings

- Final versions submitted to Canvas at milestone dates

- Professional tools used for models (Objectiver, IDEF0 software)

- Clear traceability between goals, requirements, and prototype features

V. Work Elements and Schedule

The **Visual Impairment App (Theia)** project is being developed in two major phases, with Phase II building upon Phase I foundations through advanced modeling and functional prototype development.

Phase 1: Planning and Requirements (Aug. 18 – Oct. 12) - COMPLETED

Activities Completed:

- Identified stakeholders (blind users, caretakers, accessibility staff, building owners, medical professionals)

- Developed AS-IS and TO-BE scenarios capturing real user needs

- Built initial requirements models and clarified objectives

- Drafted preliminary WRS with functional/non-functional requirements

- Created initial mockups in Figma

- Analyzed domain, functional, and non-functional requirement issues

- Documented problems and goals

Key Deliverables (Completed):

- Preliminary Project Plan (Sept. 14, 2025)

- Phase I Final Submission & Presentation (Oct. 12, 2025)

  - Final WRS with requirement specifications

  - AS-IS/TO-BE presentation

  - Meeting records

  - Comparison analysis (Theia vs. cane vs. guide dog)

Phase 2: Advanced Modeling and Prototype Development (Oct. 13 – Dec. 7) - IN PROGRESS

Sprint 1: Advanced Requirements Modeling (Oct. 13 – Nov. 9)

Activities:

- Complete KAOS Tutorial reading assignment (mandatory, 6 points)

- Develop KAOS Goal Models:

  o Overall system goals

  o Functional goals (Audio Communication, Object Detection)

  o Non-functional goals (HIPAA Compliance, UI Simplicity)

- Develop KAOS Responsibility Models (automated through Objectiver)

- Develop at least one KAOS Obstacle Model

- Create IDEF0 Process Specification modeling team's RE activities

- Develop Vision & Scope Document (all sections)

- Revise WRS to incorporate:

  o KAOS models in appropriate sections (per Page 39 guidance)

  o New requirements (Safety, HIPAA, sensors)

  o Formal resolution of issues from Phase I

- Update AS-IS/TO-BE scenarios (3 scenarios: navigation, caretaker, emergency services)

- Begin prototype development (basic navigation interface)

- Create Kanban board for task tracking

Key Deliverables (Due Nov. 9, 2025):

- **Vision & Scope Document** (complete, all sections)

- **Process Specification** (IDEF0 models with written context)

- **Revised WRS with KAOS Models** (Goal, Responsibility, Obstacle models integrated)

- **Revised AS-IS/TO-BE Presentation** (3 scenarios)

- **Initial Prototype** with basic navigation features

- **Updated User Manual**

- **Updated Final Project Plan** (this document)

Milestone Review (Nov. 9):

- KAOS models meet Chapter 3 requirements

- IDEF0 diagrams comply with Lesson 9 rules

- Prototype demonstrates basic functionality for at least one TO-BE scenario

- Vision document follows textbook template structure

- WRS properly integrates all KAOS models

Sprint 2: Prototype Refinement and Feature Expansion (Nov. 10 – Nov. 23)

Activities:

- Improve voice guidance and route planning logic

- Add fall detection and emergency alert features

- Implement HIPAA compliance measures or add disclaimer

- Conduct scenario testing with simulated blind-user workflows

- Refine user interface for accessibility

- Update user manual with expanded features

- Test prototype against all 3 TO-BE scenarios

Key Deliverables (Due Nov. 23, 2025):

- **Refined Prototype** with expanded features:
  - Voice-guided navigation
  - Obstacle detection with audio/vibration alerts
  - Fall detection and emergency contact
  - Frequent locations/history interface

- **Updated Documentation:**
  - Expanded user manual
  - Updated WRS if needed
  - Test results against TO-BE scenarios

Milestone Review (Nov. 23):

- Prototype addresses all 3 TO-BE scenarios with working functionality

- Backend programming completed (not just UI)

- Safety features implemented

- Sensor integration demonstrated

- Assumptions documented for incomplete features

Sprint 3: Integration, Testing, and Final Preparation (Nov. 24 – Dec. 7)

Activities:

- Test full navigation flow from start to destination

- Validate route planning, recalculation, and obstacle avoidance

- Refine accessibility features (audio prompts, voice commands)

- Prepare app for live demonstration (mobile device or simulator)

- Finalize all documentation:

    o Complete WRS with all KAOS models

    o Final Vision & Scope Document

    o Final Process Specification

    o Complete user manual

- Prepare final presentation:

    o Recap 3 TO-BE scenarios

    o Demonstrate prototype functionality

    o Assess feature creep vs. Phase I estimate

    o Justify system choice

- Conduct final team review of all deliverables

Key Deliverables (Due Dec. 7, 2025):

- **Final Integrated Prototype:**

    o Fully functional for demonstration

- o All 3 TO-BE scenarios operational

- o Runnable on mobile device or desktop simulator

- **Phase II Final Submission:**

  - o Final Project Plan (this document)

  - o Process Specification (IDEF0 complete)

  - o Vision & Scope Document (final)

  - o WRS with all KAOS models integrated

  - o Complete user manual

- **Final Presentation** (during dead week):

  - o Live demo with screen share

  - o Scenario walkthrough

  - o Feature creep assessment

  - o System justification

Final Review Criteria:

- Prototype covers all TO-BE scenarios presented in Phase I

- KAOS models (Goal, Responsibility, Obstacle minimum) properly integrated

- IDEF0 Process Specification accurately models team's RE activities

- All new requirements addressed (Safety, HIPAA, sensors)

- Documentation is complete, professional, and properly formatted

- Demonstration is smooth and showcases key features

Phase 3: Final Submission and Exam (Dec. 8 – Dec. 13)

Activities:

- Complete final project submission on Canvas

- Submit all documents and prototype to GitHub

- Take-home final exam

Key Deliverables:

- Final Project Submission & Presentation (Dec. 7)

- Take-home final exam (due Dec. 13)

Timeline Summary

Date	Milestone	Status
Sept. 14, 2025	Preliminary Project Plan	✓ Completed
Oct. 12, 2025	Phase I Final Submission	✓ Completed
Oct. 31, 2025	Revised AS-IS/TO-BE (3 scenarios)	✓ Completed
Nov. 9, 2025	**Sprint 1 Deliverables** (Vision, Process Spec, KAOS Models, Prototype v1)	sprint 2
Nov. 23, 2025	**Sprint 2 Deliverables** (Refined Prototype, Expanded Features)	Sprint 2
Dec. 7, 2025	**Sprint 3 Deliverables** (Final Prototype, Phase II Submission, Presentation)	Sprint 3
Dec. 13, 2025	Take-home Final Exam	individual

Critical Path Items for Phase II

1. **KAOS Models** - Foundation for WRS revision and requirements validation

2. **Functional Prototype** - Core deliverable demonstrating TO-BE scenarios

3. **IDEF0 Process Specification** - Required documentation of team's RE process

4. **Vision & Scope Document** - Establishes product context and boundaries

5. **WRS Integration** - Must incorporate all KAOS models per Page 39 guidance

Success Criteria for Phase II

If KAOS modeling falls behind:

- Focus on required models first (Goal, Responsibility, Obstacle)

- Skip optional Object and Operation models

- Share Objectiver knowledge in emergency team meeting

- Simplify goal hierarchies if needed

If prototype development is delayed:

- Prioritize one TO-BE scenario fully functional

- Implement partial functionality for other scenarios

- Document assumptions and limitations clearly

- Focus on backend logic over UI polish

If tool access issues arise:

- Have backup KAOS modeling approaches (manual diagrams)

- Use alternative IDEF0 tools

- Export work frequently to avoid data loss

If documentation integration is challenging:

- Assign dedicated integration review session

- Use KAOS Tutorial Page 39 as strict guide

- Get instructor feedback early if uncertain

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- • Logan Cribbs

- • Matthew Hill (Liaison)

- • Yaru Gao

Document Version: 0.06d-09NOV25
Last Updated: November 9, 2025
CptS 484: Software Requirements
Washington State University