

Process Specification: Requirements Engineering

Project: CPTS 484_THEIA

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1. Introduction

This document specifies the Requirements Engineering (RE) process for the THEIA project. Using the IDEF0 methodology, it models the activities, data flows, controls, and mechanisms that evolve the project from Phase I to finalized requirements and design deliverables.

2. Model Definition

- **Context:** The model covers Phase II activities from Nov 1 to Dec 1. It starts with revising Phase I deliverables and ends with submitting WRS 2.0 and prototype designs. Software implementation is out of scope for this model.
- **Viewpoint:** Technical Lead perspective, with emphasis on deliverable management, team coordination, and course compliance.
- **Purpose:** To document the workflow that addresses Phase I deficiencies, refines domain understanding, and produces the final requirements specification and mockups.

3. Context Diagram (A-0) Description

The A-0 diagram represents the highest-level view of the team's work, treating the Phase II process as a single function.

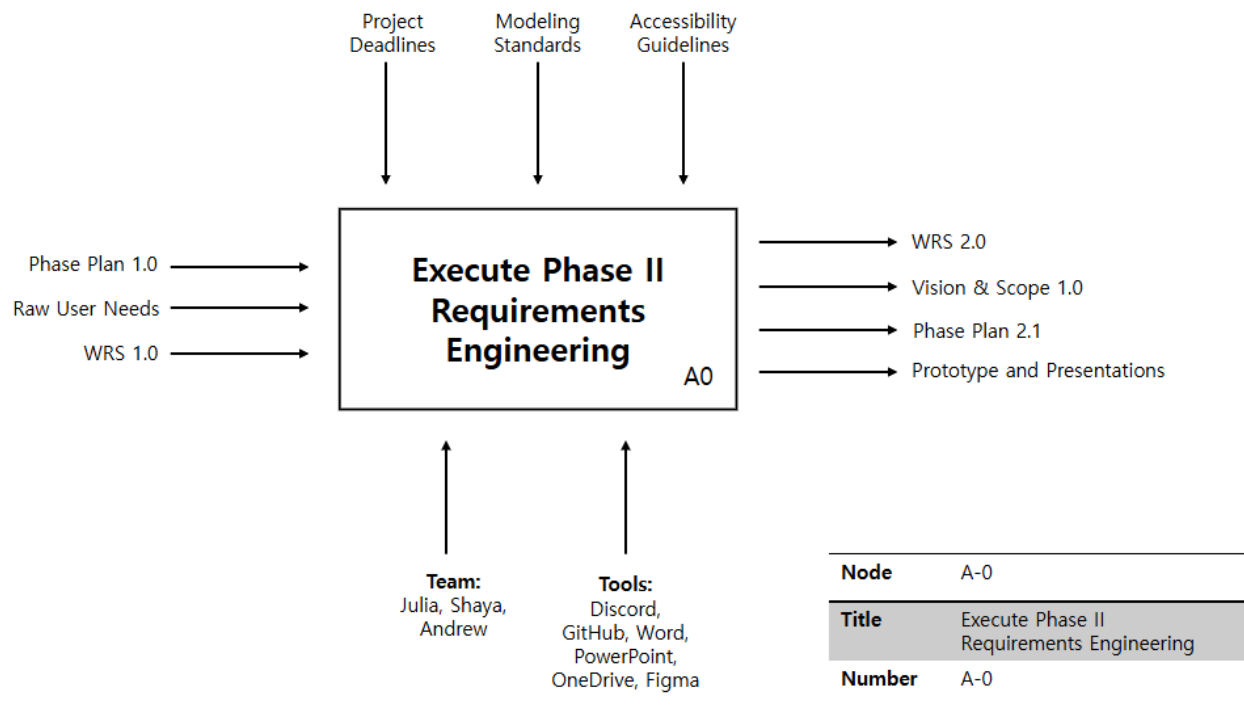


FIGURE 1: A-0 Context Diagram

Function Name: Execute Phase II Requirements Engineering

ICOM Definitions:

- **Inputs (Left):**

- Phase Plan 1.0: The preliminary documents that were created (never submitted by the previous team lead).
- Raw User Needs: Data regarding visually impaired user constraints (e.g., need for hands-free operation).
- WRS 1.0 Document: Requirements specification draft.
- **Controls (Top):**
 - Project Deadlines: Phase II Final Submission (Dec 1).
 - Modeling Standards: IDEF0 and KAOS syntax rules.
 - Accessibility Guidelines: WCAG 2.1 and Apple/Android Human Interface Guidelines.
- **Outputs (Right):**
 - WRS 2.0 Document: Refined requirements specification.
 - Vision & Scope 1.0: Business requirements document.
 - Phase Plan 2.1: Revised preliminary documents.
 - Prototype and Presentations
- **Mechanisms (Bottom):**
 - Team: Julia Lee, Shaya Arya, Andrew Neal.
 - Tools: Discord, GitHub, Microsoft Word, PowerPoint, OneDrive, Figma.

4. Decomposition Diagram (A0) Description

This section decomposes the main process into four sequential activities to ensure data consistency and detailed analysis.

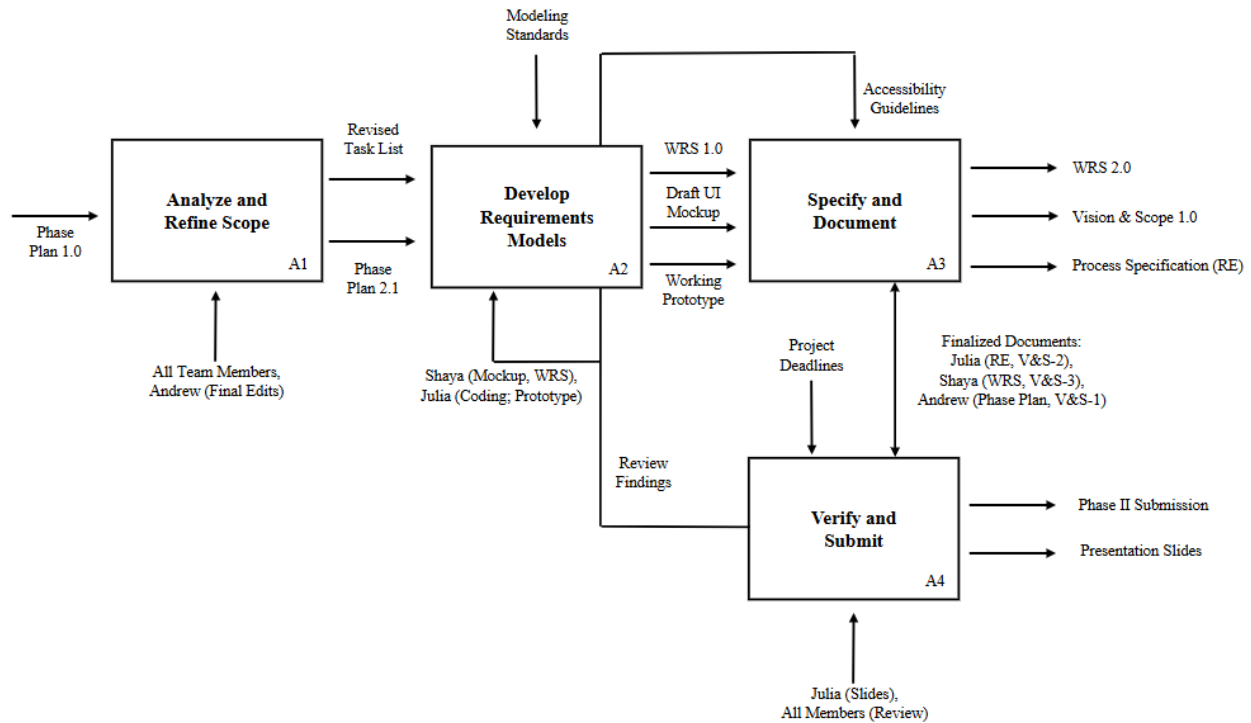


FIGURE 2: A0 Decomposition Diagram

Activity 1: Analyze and Refine Scope

- **Description:** Since the previous team lead did not submit a Phase I Plan, there is no external feedback. The team reviews the unsubmitted drafts internally, identifies missing components, and revises the project plan. All members modify the Phase Plan and review other general documents to derive from the specific task list.
- **Input:** Phase Plan 1.0.
- **Output:** Revised Task List, Updated Phase Plan.
- **Mechanism:** All Team Members (Phase Plan updates). Andrew (Final edits Phase Plan)

Activity 2: Develop Requirements Models

- **Description:** Structured models and prototypes are constructed. Shaya designs the UI Mockups, and Julia performs development tasks (coding the prototype) to refine and validate functional requirements.
- **Input:** Revised Phase Plan 2.1, Task List.
- **Control:** Modeling Standards (IDEF0, KAOS).
- **Output:** Draft WRS, Draft UI Mockups, Working Prototype.
- **Mechanism:** Shaya Arya (UI Mockups, WRS), Julia Lee (Development/Coding).
- **Feedback:** Receives revision requests from A4 (Verify).

Activity 3: Specify and Document

- **Description:** The formal WRS 2.0, Vision & Scope, and RE Process documents are written. Team members divide responsibility for specific sections:
 - **Vision & Scope:** Andrew (Section 1), Julia (Section 2), Shaya (Section 3).
 - **WRS:** Shaya (Final edits).
 - **RE:** Julia.
- **Input:** Draft WRS, Draft UI Mockups, Prototype Data.
- **Control:** Accessibility Guidelines.
- **Output:** Finalized Documents (WRS 2.0, Vision & Scope 1.0, Process Specification).
- **Mechanism:** All Team Members (Specific Roles: Julia - RE Process & Vision Sec 2; Shaya - WRS & Vision Sec 3; Andrew - Vision Sec 1 & Phase Plan).

Activity 4: Verify and Submit

- **Description:** A final peer review is conducted to ensure consistency. Julia creates presentation slides. All deliverables are integrated and submitted to Canvas/GitLab.
- **Input:** Finalized Documents.
- **Control:** Project Deadlines.
- **Output:** Phase II Submission, Presentation Slides.
- **Mechanism:** Julia Lee (Presentation Slides), All Team Members (Final Review).
- **Feedback Output:** "Review Findings" are routed back to A2 and A3 as controls/inputs for rework if errors are found.

5. Glossary of Terms

- **WRS (Requirements Specification):** Formal document defining functional and non-functional requirements.
- **Mechanisms:** Resources used to perform functions, including people and software tools.
- **Controls:** Constraints and rules that govern how a function is performed, such as deadlines and syntax rules.
- **Feedback:** Information routed from a downstream activity (e.g., Peer Review) to an upstream activity (e.g., Develop Models) to correct and improve outputs.