Developing “WoOral”: A Full Stack Web Application for Streamlined Thesis Defense Scheduling with User Interface Design Focus

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Project Overview

This study introduces “WoOral”, a web application designed to streamline the thesis defense scheduling process through modern user interface design principles and full-stack development technologies. The application emphasizes key UI design principles such as discoverability, feedback, conceptual models, affordances, signifiers, mapping, constraints, and error prevention. By adhering to well-researched design principles and focusing on user needs we developed an effective scheduling system designed for people, with people in mind.

Scheduling Oral Defense

At Wooster, the process of organizing a thesis defense involves several steps that require careful coordination. The defense itself lasts an hour, beginning with a 20-minute presentation by the student on their senior independent study, followed by a question-and-answer session with their first and second faculty readers. Thus, for scheduling such one-hour thesis defense, the student must:

1. Identify a mutual time
2. Secure a room
3. Record details on Excel
4. Inform the readers

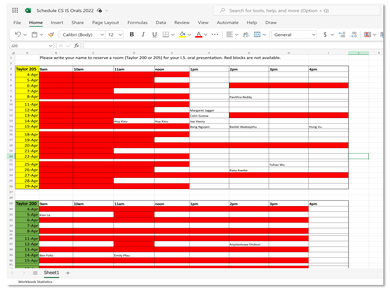


Figure 1. Current coordination using Excel spreadsheet for scheduling thesis defense.

The Problem

- Incomplete information
- Manual coordination
- Delays
- Inefficiencies
- Miscommunication
- Lack of centralization

Full Stack Development

The application is built on a 3-tier architecture which is important for outlining the application's operational framework, user interactions, and data management strategies. This architecture is composed of three primary components as illustrated in Figure 2.

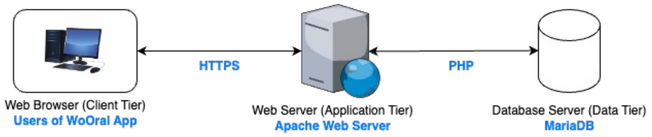
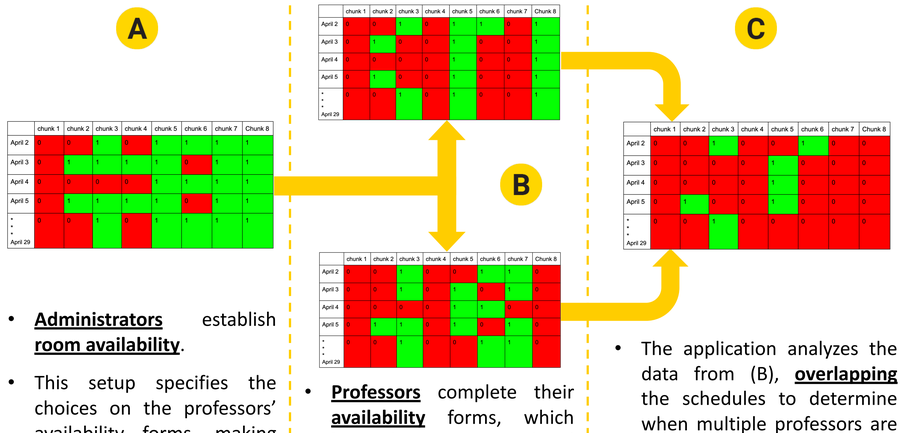


Figure 2. Three-tier web architecture diagram.

- **User Interface (Front-End):** This is where users interact with the app.
- **Web Server (Middle Tier):** This layer handles the processing of application logic. It receives user requests, interacts with the database to retrieve or update data, and sends responses back to the user interface.
- **Database (Back-End):** The foundation of our app, where all data is stored securely. It keeps everything from user information to appointment schedules, making sure quick and reliable access when needed.

Application Logic

The “WoOral” web application employs a three-tiered logic to streamline the scheduling of orals by intersecting room and professor availabilities.



- **Administrators** establish **room availability**.
- This setup specifies the choices on the professors’ availability forms, making sure selections align with the actual availability of rooms.

- **Professors** complete their **availability** forms, which have been pre-populated with the slots from (A).
- The completed forms in this tier represent finalized individual schedules ready for the system to process further.

- The application analyzes the data from (B), **overlapping** the schedules to determine when multiple professors are available concurrently.
- The green slots show a viable time for room and the two professors.
- **Now, students choose a green slot from (C).**

Don Norman’s Principles

Don Norman’s principles in user interface design have significantly shaped how designers approach the creation of user-friendly technology. His work, “The Design of Everyday Things” [2003], provides fundamental framework for understanding how users interact with technology and how designers can create more intuitive and user-friendly interfaces. I have applied these principles to design a product that excels in functionality and is accessible to a diverse user base:

1. **Discoverability (can I see it?) -** Users need to know what all the options are and know straight away how to access them.
2. **Feedback (what is it doing?)** - Every action needs a reaction. There needs to be some indication, like a sound, a moving dial, a spinning rainbow wheel, that the user’s action caused something.
3. **Constraints (why can’t I do that?)** - The limits to an interaction or an interface. Determining ways of restricting the kind of user interaction that can take place at a given moment.
4. **Mapping (where am I and where can I go?)** - The relationship between control and effect. The idea is that with good design, the controls to something will closely resemble what they affect.
5. **Consistency (have I seen this before?)** - This refers to designing interfaces to have similar operations and use similar elements for achieving similar tasks.
6. **Affordance (how do I use it?)** - The relationship between what something looks like and how it's used.

“WoOral” Web Application

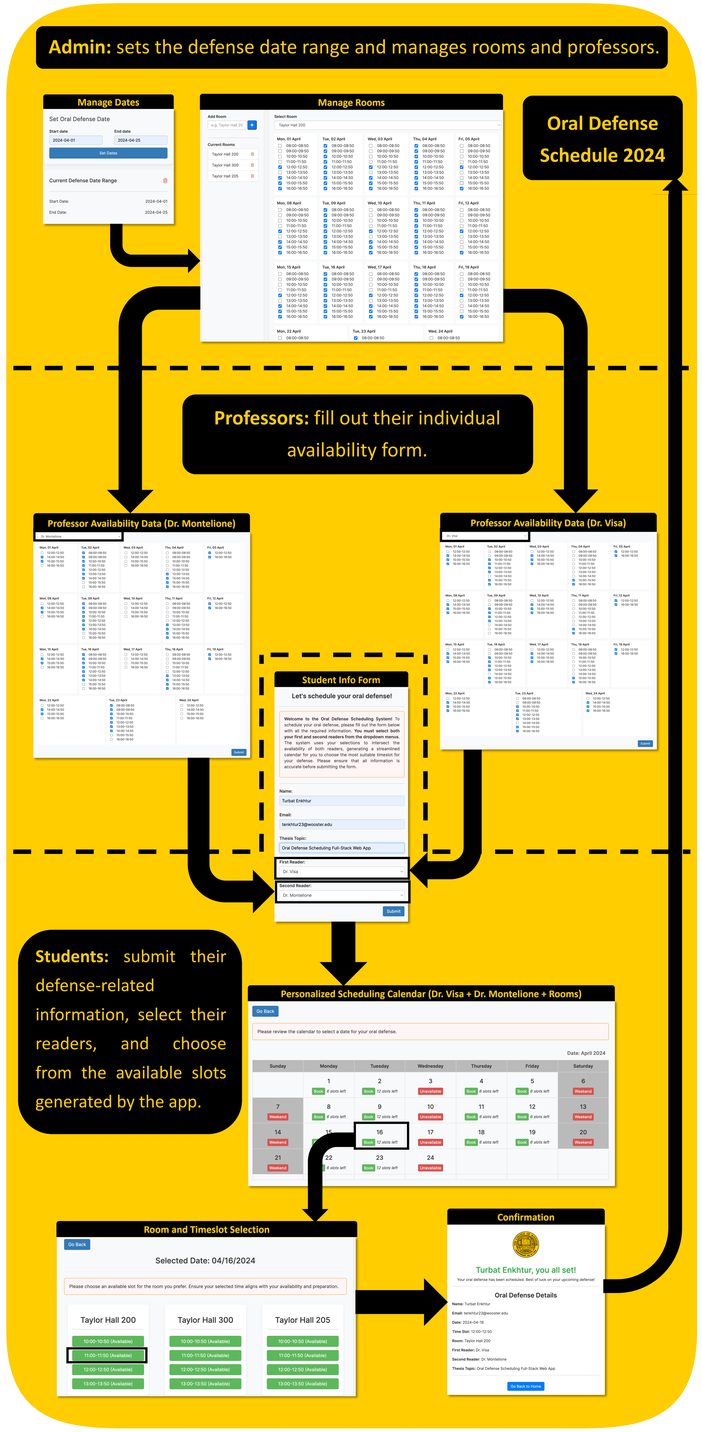


Figure 3. Illustration of sequential workflow in the “WoOral” app.

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