


Group May1713

Prison Garden Application

Client: Julie Stevens, College of Design

Advisor: Doug Jacobson, College of Engineering

Project Statement

- Provide a tool for inmates to be used for educational and rehabilitual purposes
 - Abide by prison security standards regarding internet access
 - Provide a means for admin users to track inmate progress
 - Provide an affordable final product
 - Deliverables: Web-based application, web server, user guides/manual
- 

Non-functional Requirements

- Application constraints:
 - User-friendly content organization
 - Mobile (tablet) friendly
 - Cross platform (tablets & browsers)
- Tablet constraints:
 - Durable
 - Modifiable security options



Functional Requirements

- **Safety and security**
 - Disable changing of settings
 - Disable storing persistent data
 - Only allow access to project application
- **Usability**
 - Clean and readable lessons
 - Quizzes after completing units
 - Design and create garden layouts
- **Record keeping**
 - User progress reports

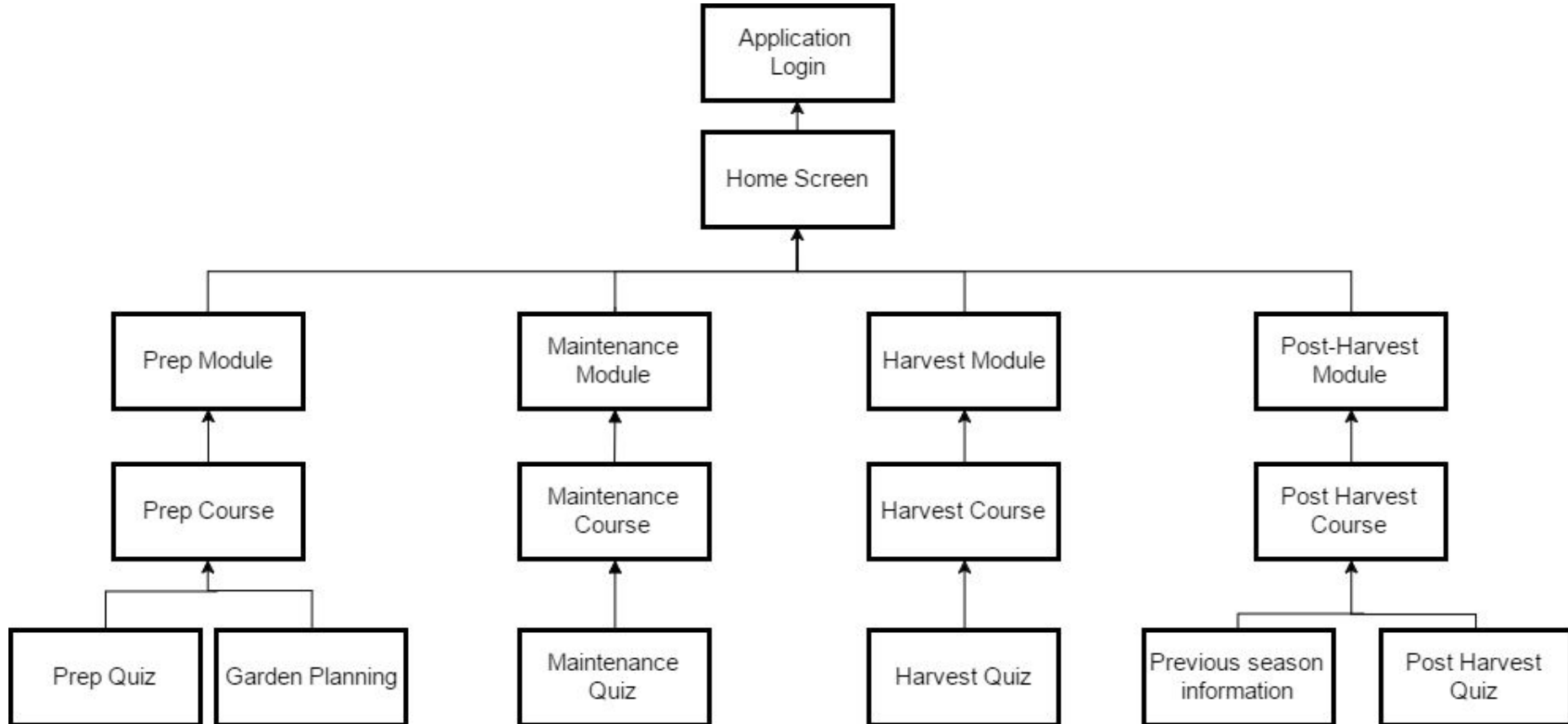


Technology Platform

- Front-end web framework
 - HTML, CSS, JS, Bootstrap
- Back-end server
 - Django (Python)
- Operating systems
 - Android 4.4, Linux (Ubuntu 16.04)
- Database
 - MySQL

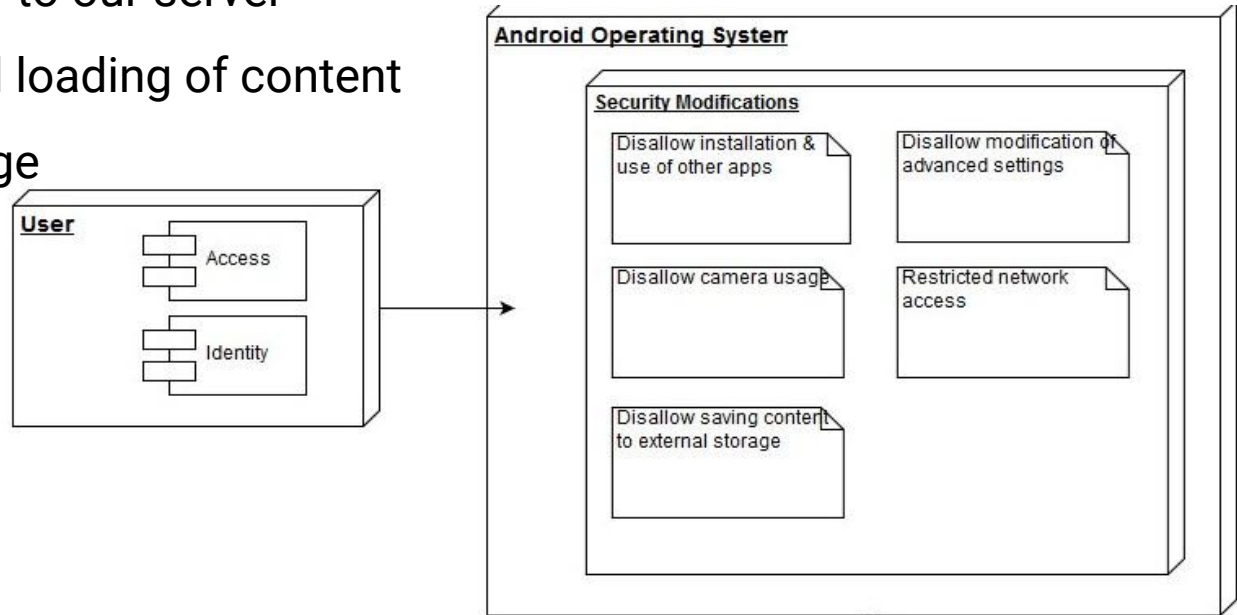


Functional Decomposition



Detailed Design - Operating System

- No other apps
- No settings modification
- Only allow connectivity to our server
- Restrict the saving and loading of content to/from external storage



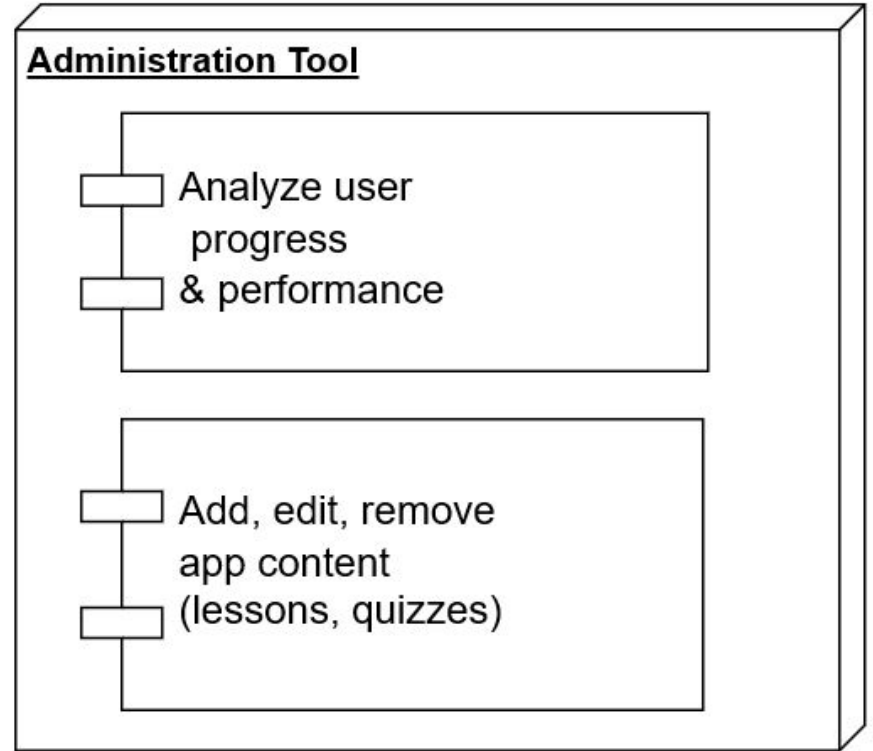
Detailed Design - Software Overview

- Admin Tool
- Inmate-facing application
- Back End
- Database



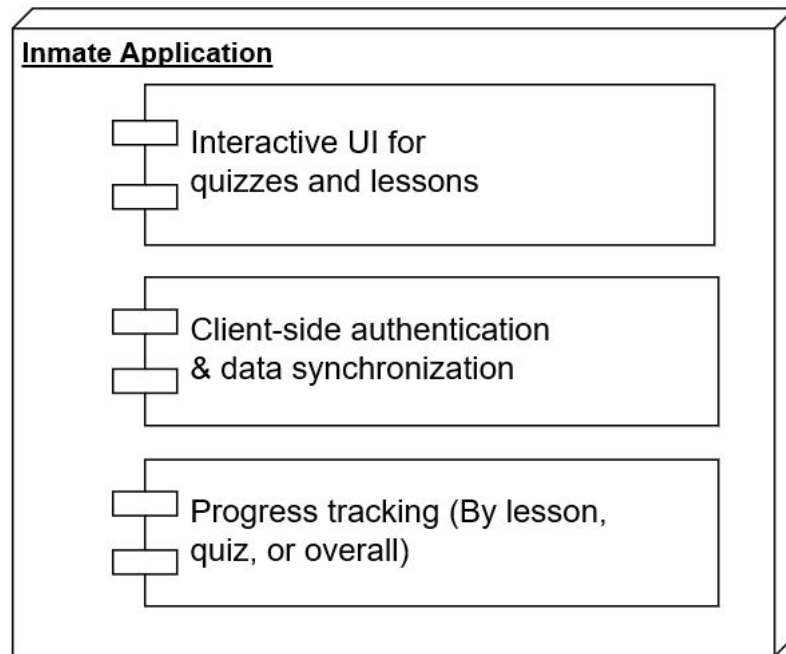
Admin Tool

- Client team exports lessons as HTML
- Link handling
- Upload format



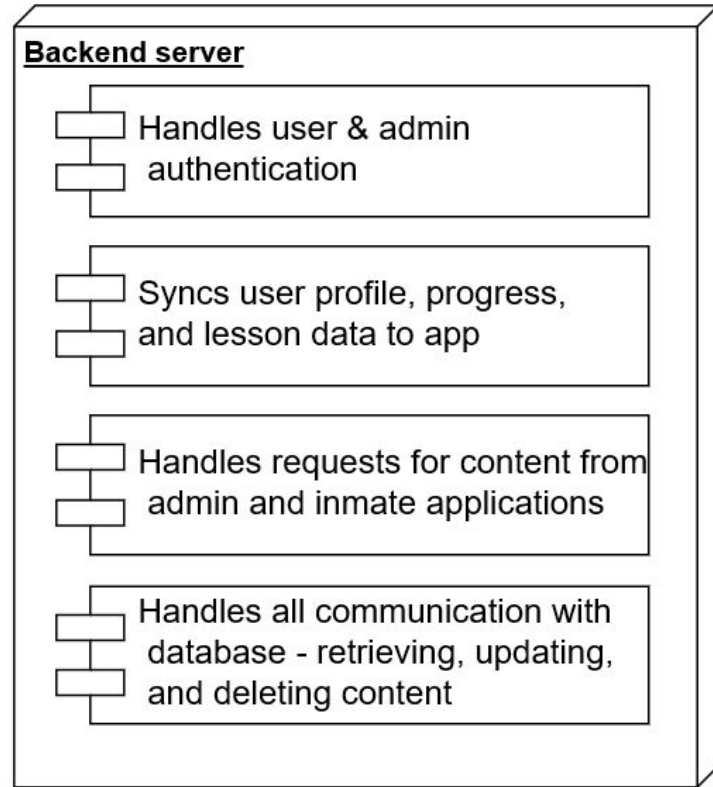
Front End

- Garden Planning
 - Create plans for garden beds
 - View the history of previous plans
- Dynamically generated menus
- Daily Records table
 - Public record of what was accomplished



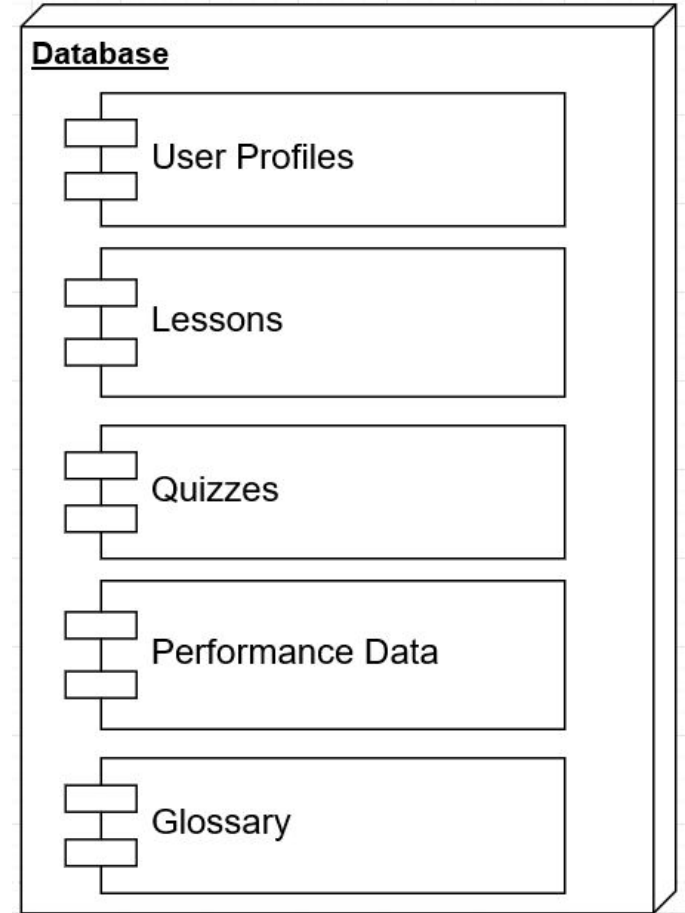
Back End

- User Authentication & Registration
- Create pages dynamically
- Populating Records Table



Detailed Design - Database

- Storing as much as possible here
- Users: Type, progress, name, password
- Lessons, articles, quizzes, images



Server Configuration

- Why Ubuntu?
 - Maintainer familiarity
 - Team familiarity
- Libraries
 - virtualenv
 - openpyxl
 - django
- Usage of virtualenv
 - Isolated dependencies
 - Cross-platform development
- Connection security
 - Minimum exposed ports
 - SSH keys only



Testing Plan and Results

- Frontend
 - Realistic scenarios to expose usability
 - User interface feedback
 - Open discussions with the design team
- Backend
 - Modular structure to ease unit testing
 - Tested logic via application use cases
 - Intentional separation from frontend



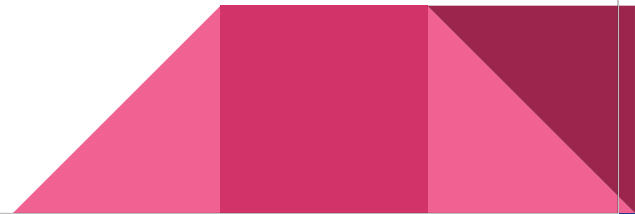
Lessons Learned

- Team Communication
 - Naming convention and coding style
 - Python version mismatch
- Time Management
 - More time for testing
- Better design and application architecture





Questions?


Design Block Diagram

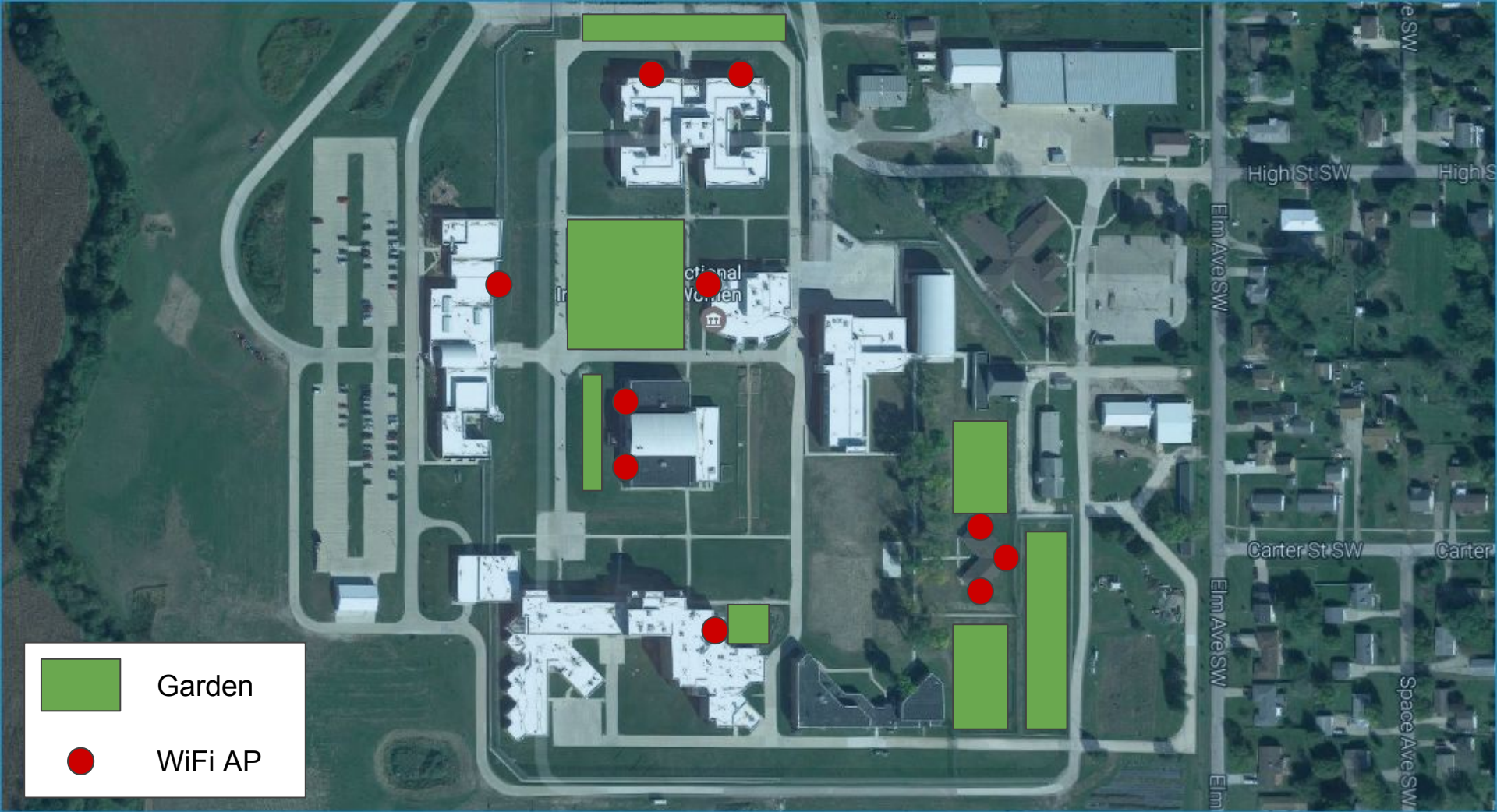


Cost Estimate

- All equipment will be funded by Julie's team and/or the prison
 - Hardware required includes a server, access points, and tablets
 - Server is going to be repurposed, so no upfront cost
 - Access points will likely be the UniFI AP at roughly \$70 per
 - Depending on the tablet, cost will likely be between \$50 and \$100 per
 - Total cost estimate: \$1150
 - Server: \$0
 - Network:\$700
 - Tablets: \$450
- 

 Garden

 WiFi AP



Future Features

- Remote content modification
- Camera integration
- Additional progress tracking

