

Prison Garden Application

Project Plan

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Revised:	19 November, 2016

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1 Introduction

1.1 PROJECT STATEMENT

The Prison Garden Application will be a tool for inmates to use in prisons across Iowa for educational and rehabilitational purposes. It will provide inmates with skills they can use to re-incorporate themselves into society, while also giving them a sense of accomplishment. This web application will meet prison security standards regarding internet by being isolated from any external networks. Progress will be tracked by a database hosted either locally or on an adjacent system.

1.2 PURPOSE

The purpose of the Prison Garden Application is to educate and rehabilitate inmates by allowing them to more efficiently track the development of their gardens within the prison. Society will benefit from this by seeing a smaller rate of reincarceration. Inmates will leave prison with a new set of skills and the confidence to use those skills in the working world.

1.3 GOALS

Through this project we hope to provide a product that is affordable and feasible to implement in Iowa's prison facilities. We hope to achieve creation of a secure server that will allow communication between inmates and ISU gardening experts that adheres to prison security standards.

2 Deliverables

This project has two primary deliverables:

- Web Application - Contains gardening instructions, progress tracking, and quiz system. Can be easily monitored and administered by Julie's team and/or prison IT personnel, if needed. The application will be written such that user experience is not affected by the device it is visited from.
- Choice of Durable & Secure Tablet - In order to comply with prison security standards, the choice of tablet is a decision not to be taken lightly. The device must permit network restrictions as well as restrictions to peripherals (camera, microphone, etc). The tablet should also be durable so as to survive any drops or general dirtiness that comes from being used outdoors.

Additionally, there will likely be supplementary deliverables created to accompany the two mentioned above:

- User Guide - Instructions for using the application from the perspective of a normal user (inmate). These will need to be easy to read and as non-technical as possible.
- Administrator Guide - Instructions for managing the application from the perspective of a project administrator: likely a member of Julie's team. This content should explain how to perform the necessary modification of gardening content. There should exist a non-technical interface for easily adding new "lessons" to the application.
- Feature Compliance Document - This is a document that explicitly states the various prison restrictions (for the application) and the steps we took to ensure they are satisfied. As an example, if the only networking allowed is a service-level connection to the central database, then this document would describe how we disabled all other network capabilities.

3 Design

3.1 PREVIOUS WORK/LITERATURE

A company by the name of Edovo has a similar product. Their program requires a connection to their secure server but no internet. It restricts external communication and internet access, and the program allows for real time tracking and control of usage and content.

Edovo includes educational courses as well as cognitive behavioural therapy, vocational and life skills training. They also provide a service they call EdovoGo, which allows users to continue progress after they've returned home. Edovo can provide the necessary hardware or integrate with existing hardware.

Upon completion of a learning pathway users can receive certificates and other rewards. Even as they reach goals they are awarded with points that grant access to entertainment content. Edovo also allows you to integrate your own education and training pathways. [Edovo]

Alabama state prisons have started a pilot program that will provide inmates with access to Edovo's tablets. Edovo also provides tablets for prisons in California, Illinois and Pennsylvania. [Cason]

3.2 PROPOSED SYSTEM BLOCK DIAGRAM

See Appendix A.

3.3 ASSESSMENT OF PROPOSED METHODS

ADB vs Secure WiFi: Initially, it was thought that the tablets would benefit from having zero networking capabilities. Due to this, an approach was designed to sync the users' progress back to a database by transferring the data over the Android Debug Bridge (ADB). While this method is more secure, it lacks flexibility and would also require that the entire application database be stored on the device, which is a large storage bottleneck.

After a review of the specific restrictions able to be placed on specific android user profiles, allowing a minimal amount of wireless connectivity seems possible. So long as no arbitrary web services are allowed, a network connection to a secure web server would eliminate the need for a local instance of the database. It would also allow for the entire application to be hosted server-side, which provides numerous benefits including locality and maintainability.

User Restriction at OS Level vs Application Level: Since the decision was made to have our project be a web application, user authentication becomes a much simpler task. Most web frameworks have built-in support for handling logins, which we will be sure

to look into. Furthermore, some frameworks come with an administrative portal that can be used for managing individual users.

Allowing the use of peripherals(cameras, microphones, etc.): The first idea would be that we could use the cameras on the tablets as a form of tool and communication with the administrator and the users. The only problem would be that if we completely eliminated the use of peripherals then the project would be easier to develop and work on rather than allowing access which would be a bit more time consuming and the team would have to account with creating security measure for the use of the peripherals. Currently, our team is still discussing on the use of peripherals at the time.

Method for Adding Content: Developing a sophisticated interface for adding new content that requires no coding could be difficult. However, pursuing this would allow for admin users to edit or remove existing content as well. We could develop a process for dynamically building the content pages with a default template, then when an admin wants to create a new form they would have to follow that template.

3.4 VALIDATION

Thus far, our team has devised three primary methods for eliciting feedback on the success and usability of the application.

1. Post-lesson surveys
2. Discussions with users
3. Discussions with Julie's team

4 Project Requirements/Specifications

4.1 FUNCTIONAL

The application shall prompt for credentials when it is visited. The application has to support multiple users and will need keep track of individual progress for each.

The application shall allow users to view lessons and instructions for furthering their progress within the prison's gardening program.

The application shall prompt the user for small objective quizzes after each lesson/educational section. After the user goes through the desired lesson/educational section, the application will prompt if the user is ready to take a quiz, and display the quiz when ready.

The application shall assist the user in the form of navigational tools and tips. When the user logs in, the application will give small helpful tips on how to navigate through the application or how to use some of the features.

The application shall prompt the user if they are ready to log out. When the user clicks on the logout button, the application will ask if the user is ready to log out.

The OS shall restrict application access to only the gardening application created by our team.

The OS shall have a special, restricted profile to be used by the inmates. This profile will disallow the changing of settings and store no persistent data.

4.2 NON-FUNCTIONAL

The tablet needed for the application shall be very durable in terms of it possibly being dropped or even tampered with. The tablet will be given to inmates and needs to be sturdy so that it can not be modified on a hardware level.

The OS on the tablet shall have its security options modified. This is so that the the inmates will not be able to tamper with the application or tablet on a software level.

The application shall have its content organized in a user-friendly manner. The application will have a high volume of content to educate users on gardening. The UI needs to be organized into sections so that way the user does not get lost when trying to navigate the application.

The application shall to be mobile friendly: specifically with tablets. The application will be very interactive and tablets are the current platform we will be developing on.

The application shall to support multiple user profiles. The application will need to be able to handle different users signing into the application and be able to sync their progress back to a database.

5 Challenges

Customizing the tablet's OS to handle security constraints

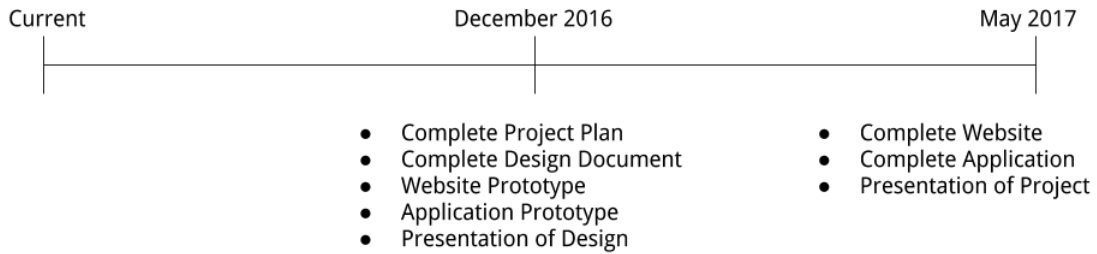
We need to use a system that allows multiple users to track their individual progress within a single application. This may be done through a multi-user OS on the device if possible, or just through username & password within the application itself. We also need to keep track of the photos taken by each user of the device. Again, this could be achieved by using a multi-user OS or by only allowing our application to interact with the device's camera.

Additional security complications will need to be handled for our project to be approved by prison systems. We must forbid network connectivity on the device, or else only allow connections to a server we are using for the project. Moreover, our client mentioned applications of location data for our project. Although this isn't a primary focus, we may have to consider how to allow the use of device location tracking in a secure manner if we end up incorporating the content that will utilize it.

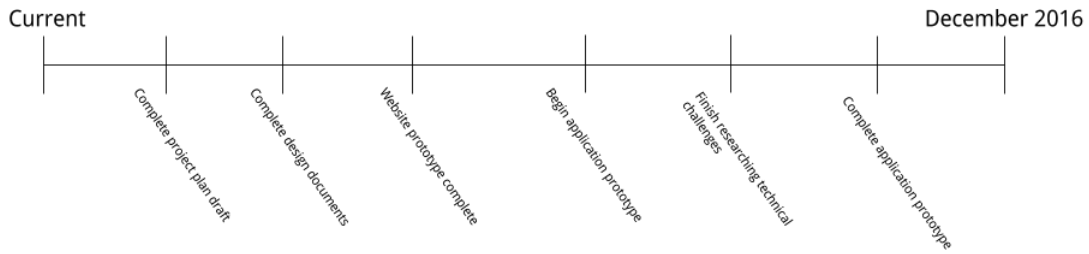
Adding new content to the application

After we finish our project, our client would like the ability to add/remove/modify content related to the gardening lessons. Since she is not an experienced developer, we need to create an easy to use procedure that will allow her to perform these administrative activities. For this reason, we will need to design a simple format to represent a lesson. One option that has been considered is creating a small Domain Specific Language (possibly based on Markdown) that Julie and her team can use to signify content.

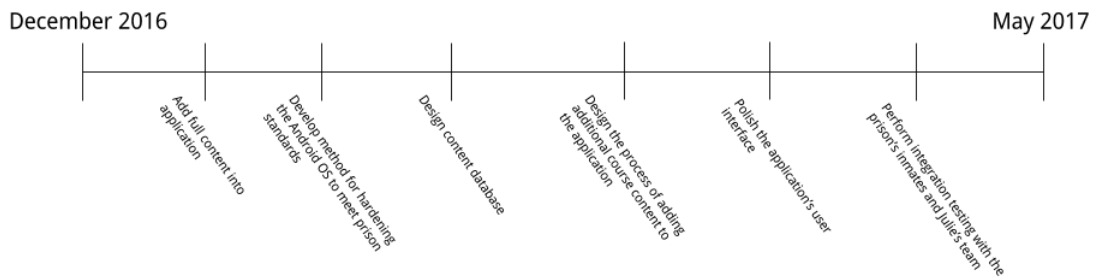
6 Timeline



6.1 FIRST SEMESTER



6.2 SECOND SEMESTER



7 Conclusions

The Prison Garden Application will be a tool for inmates to use in prisons across Iowa for educational and rehabilitational purposes. This web application will meet prison security standards regarding internet access by restricting wifi. The purpose of the Prison Garden Application is to educate and rehabilitate inmates by allowing them to more efficiently track the development of their gardens within the prison.

Inmates will leave prison with a new set of skills and the confidence to use those skills in the working world. We hope to achieve creation of a secure server that will allow communication between inmates and ISU gardening experts that adheres to prison security standards.

8 References

Edovo Jail Education Solutions. <https://edovo.com/>.

Cason, M. (2015, August 20). *Julia Tutwiler inmates to learn on tablets in new pilot program*. Retrieved from www.al.com/news/index.ssf/2015/08/julia_tutwiler_inmates_to_learn.html.

9 Appendix

A: Block Diagram

