**Tech Talk Overview**

**Grant Saylor, Kyle Smith, Anthony Tran, Jiayi Xu**

**DATE**

**Topic:**

***Total Runtime: 15-20 minutes***

**Presenters:**

* ***Anthony***
* ***Grant***
* ***Kyle***
* ***Jiayi***

**Transcript:**

***<Grant Saylor – Slides 1 - 5>***

**1 min – 5 mins:**

***Slide 1 – Title:***

Hi everyone, we are Libraworks, the team behind *Virtual Library*, we hope this presentation will give you a sneak peek and view into the story of our development to this point.

***Slide 2 – Project Description:***

My name is Grant Saylor and I want to talk about some of the inspirations and overviews of our application and team.

We decided to call ourselves Libraworks because “Libra” comes from the Latin word “Taberna Libraria” which roughly means “place of books.” This is thematic to our application, *Virtual Library* because this app is designed to be a place of books where you can gather many different titles from different places.

Our app, *Virtual Library* is used to create a software layer on top of a physical real-world location to facilitate the tracking of books and users within a virtual circulation system, much like a real-world library would do with its library card and librarians.

***Slide 3 – The Project Inspiration:***

*Virtual Library* was originally inspired by Amazon’s internal employee library system, where employees can list and checkout books from one another using an internal service.

As time went on, our app vision grew with our own ideas, and events in the real world began to shape the vision of what was the app into a slightly different model where users didn’t have to interact physically with one another to check out a title.

Across North America many neighborhoods have a “Little Free Library” which allows a person to set up a system for patrons to go to a free library set up outside their home and take a book.

The *Virtual Library* app hopes to add a layer of connectedness and to this system.

In our era of COVID, sharing and borrowing books safely (without contact) can really bring us all together, and having an app that is extensible to add features that users may want allows us to bring people together in a library, virtually.

***Slide 4 – How a Little Library Currently Operates:***

To give you a quick idea of the landscape we’re working in, currently an existing “Free Little Library” is simply a box with books inside of it. Users can bring their own books for donation, take a book for borrowing and the librarian has no way to really track the inventory or catalogue what books they have in their library unless they manually do this via an excel sheet or word processor. On the next slide you’ll understand a bit better how our app connects with this to make it a more feature rich experience.

***Slide 5 – Our Vision:***

Throughout development, our vision for *Virtual Library* has been to improve upon the existing Little Free Library system by adding a software layer on top of the already designed infrastructure. We want our app to allow users to check books in and out of the *Virtual Library* database so that each library’s database of books can be maintained, books can easily be searched for and users can view a map system to see what libraries are near them. I’ll talk a bit more in-depth about these in a moment.

Furthering our vision, we’ve designed our app so it can be extensible for the future, whether that is adding a full social-network user system or adding a the ability for an in-app request screen so users can ask a librarian to add a book or ask the developers to add a feature.

As you can see from the diagram in the lower right, we are approximately two months into development, we have about nine more months to add features and refine existing functionality into something that is easy and pleasant to use.  
  
Above all else, the app needs to be an easy to use system where any person can use the app without feeling frustrated, we want the app to melt away into your hands.

***Slide 6 – High Level Overview:***

To give you a high-level overview I want to talk some more about the map, search and checkout components. In order to implement each of these, we must meet our user requirements such as internet and camera access, Jiayi will cover these on the next slide.

At its most basic level, *Virtual Library* consists of three different screens, the map, the search and the checkout, each screen interacts with each other to provide a full featured experience.   
  
Upon opening the map you’re presented with pins which take you to a library, this utilizes the Google Maps API, but, say you wanted to get to this library screen in a different way, well, you could open up a search screen instead and type the title of the book you want, this utilizes the Firebase Database, filtering in and out the names of the libraries which contain that title.

From there you are presented with a checkout screen, all you have to do is point a camera at a barcode and complete the checkout process, utilizing our last API, the OpenLibrary API, to get the books content (like the title, author and cover.)

Later in the presentation we’ll go more in-depth into each of these main components, but for now I’ll hand it off to Jiayi so she can talk about the user requirements.

***<Jiayi Xu –6 - 10 >***

**5 mins – 10 mins:**

**Slide 7:**

* I am Jiayi Xu. Grant mentioned the user requirements of Virtual Library.  As you can see, to implement Virtual Library, there are 7 requirements.
* These are “Access to device’s GPS” which can know the location of the user. “Internet connection on user’s device” which can use map and update data in realtime, also to test application and to version control.
* The third requirement is about database, I will talk about this part in a few more slides.
* The map API requirement is an important feature for the Virtual Library. The map will allow user to see what libraries are near them, Kyle will introduce more information about this part.
* The privacy policy is for user registration condition, the camera use is for scanning ISBN numbers, and to access the database is for checking in or out books within our database.

**Slide 8:**

* This slide is the architectural design of the system.  There are three options on the main screen: the map button, search button, and login button.  Buttons on each screen guide user to different interfaces. From the login screen, users can register a new account or log into an existing one.
* The map and search screens will lead user to access the Library screen, this utilizes the Google Maps API
* This system will require user to login if they want to check in or out books.  The red arrow shows how a user might be redirected to login when attempting to checkout a book if they are not currently logged in, and then the user would be returned to the screen after.
* The whole system will interact with our Firebase database to locate libraries, catalogue their contents, and allow the users to check in or out books.
* Let’s imagine a use-case scenario.  Let’s say you are trying to use our app to locate and check out a specific book.  You would open the app and be presented with the main screen.  You would then click on the button to search a book and begin entering the requisite information.  The search module will be communicating with our database to find that book at a nearby location and present the information to you.  Once you select a library from the results, it will take you to the library screen, where you can begin the checkout process.  Once you select checkout, you can simply scan the book, the app will communicate with the database and OpenLibrary API that the book is now checked out, and you are good to go!

**Slide 9:**

* We need a database to hold information about the LFL around the user, as well as the books within our system.  It needs to keep track of things like information about the book such as the title, author, publication date, cover, etc.  To do this, we are using Firebase as our database for the app.
* We want to store our data in Firebase so that we can display the library circulation to users, and they can see what books are available for them to checkout of their local LFL.  The information that we are storing comes from the scanning function of our app, which communicates with a book API to give us the book’s information.  We also need to be able to create new library locations for other LFL in the area.  We hope to have users of the app submit locations of LFL to be included in our app, which will have their locations stored in the database, and we can then populate their circulations with the books available.
* Initially, we encountered a problem uploading information to the database, and had to learn more about how to interact with it from within both the app as well as Android Studio.  With Firebase, we are able to monitor changes to the database instantaneously and were able to check that the correct information was being uploaded when we would use the scan function.
* This aspect of our program is teaching us lots of new things -- we are able to take a lot of things we’ve learned from Database Systems class and apply it to this No-SQL database, but there is still a lot to learn when using it in the real world.
* Kyle will continue to introduce more details about Virtual Library.

***<Kyle Smith – 11 - 14>***

**10 mins – 15 mins:**

***<Anthony Tran – 15 - 22>***

**15 mins – 20 mins:**

**Slide 14**:

Now I’ll show you a demonstration of how our Virtual Library App works. This presentation was prerecorded on an actual android hardware. I will be pausing and explaining parts of the video for better clarity.

**Slide 15**:

(paused @ 0:00) For our presentation, we will show the application running alongside the Realtime database simultaneously. Currently we are on the main screen that of our application. It currently has 3 options to choose from: View Libraries, Search for Books and Login/Register

(Play video until 0:09) The Login/Register button allows users to create accounts to use on our application. Users can enter in their username, emails and passwords to log in.

(Play video until 0:21) Search for book which allows user to search for individual books by entering in the title or author

(0:22 to 0:27) We will be focusing on View Libraries which will allow the user to see available libraries in our system. This portion uses the map API that Kyle mentions. A marker represents a library.

(0:28 to End) When we click on the library, it’ll populate books from that little library. Here we will add a book into the library database by scanning the ISBN barcode of the book. Once it is scanned successfully, pop up a notification on the app, while updating the database in real time with its corresponding ISBN number and Json information.

**Slide 16**:

We wanted to test whether any kind of ISBN type would work for our application, such as ISBN 10 and 13. We also wanted to make sure that we were able to grab the json contents from the library API files so that we can use important information from it. Another idea we had was to test fail cases, such as scanning non ISBN barcodes or not even scanning a barcode.

**Slide 17**:

Here we scanned 3 different ISBN barcodes of 3 different. When we successfully scanned them, we were able to grab the json file data and store that as well. Initially we had issues using regex to grab information from the Json file, but we later found out that we can create a JSON object that can extract data for us without using Regex

Now for our fail case. We technically scanned nothing and what it returned was null, which was something we were hoping to get.

***<Grant Saylor – Slides 18-21>***

**Slide 18**:

In the future, we hope to implement a more robust database system to store a large variety of books as well as completing the login functionality. Not only that, we want to further the functionality of the map like adding more libraries and implementing favorite libraries. And of course want our application to be as bug free as possible.

Slide 19: Here are all the links to Our development tool sources

Slide 20: And here is all the public domain artwork licenses for our applications.

Slide 21: Thank for listening to our Virtual Library Live Demo. Does anyone have any questions?