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| Student Resources App |

**Abstract**: Currently, it is difficult for students to find events that are of interest to them in a single location. This mobile application helps academic advisors plan events, and for students to access these events in a centralized location. This app should reduce the difficulty for students to find events that are relevant to them and for advisors to add and manage events, with the database being updated in real time to ensure up-to-date information.

1. **Introduction**

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SFU is one of the biggest universities in Canada with more than 35,000 students and more than 100 undergrad programs [1]. It is becoming very hard for a first-year student to adapt these sudden changes as 98% of the first-year students transfers from a well-known compact environment (High Schools) to a completely unknown new environment (University). In university, there is no one to guide or help a student and the only resource they can seek help from are the academic, general and career advisors. As there are only limited number of advisors available as compared to the number of students in each faculty. For instance, if I want to visit a career or general advisor, I need to book an appointment 3 weeks prior to the date of visit. Therefore, there is a lack of communication between the student and the advisors and as there is no one to tell them more about the:

● Resource available on campus to help a student to build up their resume

● Volunteer as well as paid job opportunities

● Skill building programs which can help a student to improve their communication,

analytics, social, networking and many other skills.

# **II. System’s Functions and Features**

The application will have two major features. First, it will allow students to browse events by department and by major. Secondly, it will allow academic advisors sign in and add events. Academic advisors will have to log in before they can begin creating such events. This app will store and read all the event information in a Firebase database. The Firebase Realtime Database is described as:

“…a cloud-hosted database. Data is stored as JSON and synchronized in realtime to every connected client. When you build cross-platform apps with our iOS, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates with the newest data.” [2]

The Firebase Real-time Database allows us to store and sync data across all clients in real-time, yet making it available when your app goes offline.

In the student side of the app, users will be able to browse events by department and faculty. This will allow students to quickly find events relevant to their interests. Once the student has selected their department and faculty, events will be loaded from the database. Each event will display the: event name, event time, event date, event location, event description, and who the event was organized by.

In the advisor side of the app, users will first be required to sign in (implementation still in progress) with their SFU email and password. Once logged in, advisors may then add new events or edit currently posted events. When adding a new event, advisors will be required to add an event name and all other relevant fields. They will then select the appropriate department and faculty location for the event. Once submitted, the app connected to the Firebase Database and saves the information. The edit event section allows advisors to edit previously added events. These events will be saved in their same original location once the edit is submitted.

The Navbar provides several ease-of-use features that allow an enhanced user experience such as: a settings section that has an about page, that gives more information about the developers and the application itself. Furthermore, up buttons have been added to most activities to allow for a smooth navigation experience.

# **III. Required Functionality**

## A. Functional

Advisors shall be able to log in.

Advisors shall be able to add events.

Students shall be able to find events by department and major.

Events shall be saved in a database.

Events shall be read from a database.

## B. Non-Functional

UI shall be simple and easy-to-use.

Database information shall be secure.

Load times for saving events shall be short.

Reading event information from the database shall be quick.

# IV. Desired Functionality

## A. Functional

Advisors should be able to edit previously added events.

Advisors should be able to add event locations.

Advisors should be able to add pictures to events.

Events should be able to be sorted by: deadline, name.

Events should be viewed in CardViews.

Cards should be displayed inside a RecyclerView.

## B. Non-Functional

App should conform to Android material design guidelines.

Database read and write operations should be quick.

# **V. System Models (Basic system Overview)**

Sprint1Diagram.png

**VI. Fundamental System Assumptions**

System assumes all users (academic advisors) have their login credentials already in the system or are going to input them through the Sign-Up activity.

Academic Advisors will input accurate information about all events, including

requirements/pre-requisites to attend each event.

Assumes app users are capable of running Android API level 16 or higher.

Assumes app has WIFI or data connectivity to download and save events

# **VII. Main issues in development**

## A. Choosing the correct Database System to allow syncing of data between users and advisors

Some of the core concerns in this regard were the following:

* How to implement the database correctly so that the implementation meets requirements.
* How to accurately sync data between all devices with the app installed.
* How to keep the app running at an acceptable speed while data transfer is occurring.

The solution that we found to the aforementioned concerns is using the Firebase platform instead of an SQLite implementation. This ensures that the current version of the database is accurate and on all devices using the app, ensuring that events that are modified, deleted, or added are reflected instantly. Additionally, the Firebase platform makes processes such as creation of database, creation of tables, addition/filling of tables, and database lookup facile, due to its functions. On the other hand, the functionality to meet all the mentioned activities would have to be implemented manually on a SQLite database.

## B. Learning Git

Some of the core concerns in this regard were the following:

* Using git commands properly.
* Understanding: merge, pull, branches, etc.

Developing a functional understanding of the aforementioned points was key to ensure effective and efficient collaboration in a group setting. This ensured that members could work on the codebase remotely and were able to pull the latest version of the code. It also ensured that a member was able to push code after adding new functionality or editing existing code, without breaking the build.

To keep workflow simple we created a develop branch where changes in the codebase would be pushed to initially. Each sprint we merged a working version of the develop code into the master branch to signify that the code was ready for production. Also, several members of the team created separate branches to test and develop new features and functionality.

# **VIII. UML**

* As a student, I want to search for events within my department so I can find the ones most interesting to me.
* As a student, I want to find out information about who posted the event, when and where it is, and details about it.
* As an advisor, I want my credentials verified before events can be posted so that I know only official events are shown.
* As an advisor, I want the layout to incorporated SFU colors so students feel the app looks professional.
* As an advisor, I want to edit my previously posted events and view how they look from the student view.

# **IX. Future plans for the application**

The application will have two major features:

* allow students to browse events by department and by major.
* allow academic advisors to sign in and add events and edit events.

Academic advisors will have to login before they can begin creating such events. This app will store and read all the event information in a database.

If this app were to be fully published it would require a database of all registered advisors at SFU. This would link to the login system, and allow only registered advisors to publish and edit events. In the applications current version, anyone can login and create events.

Also, the app could be restructured using the MVC model to clean up the code and increase reusability. Currently code is mainly written within the display activities, but in possible future iterations this could be easily reworked. Furthermore, unit testing should be done on most (or all) classes within the app.

**X. Conclusion**

The application meets all the required and desired functionality that were determined in the first sprint cycle. It is able to maintain an up-to-date database and sync in real time, reflecting all modifications to it. Thusly, the final product is ready for beta testing with SFU students and advisors to evaluate the validity of the app.

Creating this application was a fantastic learning experience for everyone on the team. Not only did we get the chance to improve our coding skills and understanding of the Android Architecture, we also learnt important interpersonal skills as well. Communication and teamwork were important factors in making the final product.

# **XI. Glossary**

Mobile Application:

A type of application software designed to run on a mobile

device.

Database:

A structured set of data held in a computer, especially one that is

Accessible in various ways.

UI (User Interface):

The means by which the user and a computer system interact, in

particular the use of input devices and software.

View:

The basic building block for UI components in android. Responsible for

drawing and event handling.

FrameLayout:

A View designed to block an area of the screen to display a single

item.

CardView:

A FrameLayout with rounded corner background and shadow.

Activity:

A single, focused thing that the user can do. Almost all activities interact

with the user, so the Activity class takes care of creating a window (UI).

SQLite Database:

An open source database that stores data to a text file on a device.

Firebase Realtime Database:

A cloud-hosted database that saves data as JSON format, and

synchronizes data in realtime to every connected client.

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References

[1] Janna Whelan (1993-08-22). ["Simon Fraser University"](http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=U1ARTU0003218). The Canadian Encyclopedia. Retrieved 2011-02-20.

[2] <https://firebase.google.com/docs/database/>

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