**CAPSTONE PROJECT PROPOSAL**

**College Rewards**

**PREPARED FOR**

**ADVISOR Name**

**PREPARED BY**

**Teem Too**



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| **PROJECT NAME** | College Rewards Application | | |
| **EST. START DATE** | January 23rd, 2024 | **EST. FINISH DATE** | May 3rd, 2024 |
| **SUBMITTED TO** | Gillian Maurer | **COMPANY** | Capstone Committee |
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| **SUBMITTED BY** | Teem Too | **COMPANY** | INFOTC 4790W |
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| **PROJECT OVERVIEW** |
| This project is to build an Android mobile application called College Rewards. The purpose of College Rewards is to incentivize student participation in extracurricular activities on college campuses through gamification, prizes and competition. Team members include Shawn Davenport, Tony Neubeck, Andrew Caskey, Sam Koske, and Calvin Nanneman. The 12 week timeline of the project includes, two weeks of conceptualization/research/familiarization, one week on UI design, seven weeks on development and two weeks of testing and troubleshooting. |
| **PURPOSE / GOALS** |
| The goal of College Rewards is to incentivize student participation in extracurricular activities**1** on college campuses. Student involvement in extracurricular activities is important as participation provides a variety of benefits such as, academic performance and well being. **2** Nearly one third of students do not participate in any extracurriculars **3** and recently there has been a decline in student participation in extracurricular activities **4.** To enhance student participation there is evidence that incentives, rewards and promotions will help **4.** The College Rewards Android mobile app will incentivize student participation in extracurricular activities by promoting awareness of activities; via an upcoming event calendar, the ability to earn rewards points, and cash those points in for prizes, as well as earn badges for attending a variety of events, and compete against their friends for the top leaderboard spot. Account information will be stored securely on Firebase**5**. Users will earn reward points by attending various events that are created by a university’s admin. Users will verify their attendance to an event by checking into events on the while they are within the geofence of the event. The app will take standard Android practices**6** to prevent spoofing of geolocation. The application will have multiple pages, easily accessed by a navigation bar at the bottom of the UI. Pages will include a user home page, a Calendar page to show upcoming events, and leaderboard of users with the most points. |

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| **OBSTACLES** |
| Some obstacles that our group feels like we will come across and have to find a way to overcome would be the limited experience some of our members have with Android app development and the software we are using. We plan on each person contributing to the back-end building of this app but we will first have to gain an understanding of the products we use. Another obstacle we will face is staying on track with our progress and not letting an issue in one area stop us from improving another part of our app. Another obstacle that our group may face will be during the research process and finding events to populate our app with and be able to implement these events in our in-app calendar. We will need to set a parameter for qualifying events that we can include in our app so we do not overpopulate the app with too much data. |
| **INDUSTRY / MARKET RISK FACTORS** |
| A large risk factor that we face in building this app is getting schools to participate in this app and schools to want to use this app with their students. There may be schools that have a point system like this for attending sports games but there is no system that has rewards for every event of every kind. The universities would need to promote the app in or to get their student base to want to join the app and start earning reward points. That leads to our second risk factor, which is student involvement. Much like every social application, our product becomes better with more people using it. More students involved means more competition in the app, the ability to expand the rewards, and add more features like a nationwide board and school competitions. The only competition that we would face in the market would be schools having their own app to get students to attend more activities. |
| **BUDGETARY RISK FACTORS** |
| We are hoping to keep the costs of our project as low as possible while still having the necessary tools to create a professional application. The only budget restriction that we may run into is the cost of a Firebase License/ subscription that we plan on using to host our database for our accounts and our events. We also plan on using this for our authentication. We plan on using the free version of Firebase for this, however, if we come across issues we will use the full version. This goes for any of our software. We want to use the free versions if we can but will expand our budget or find alternatives if we come across problems. We are still in the research phase and believe there could be more budgeting concerns that we are missing. |
| **HARDWARE COMPATIBILITY** |
| For the user of our app, the hardware requirements are minimal but specific. They would need an Android phone running Android 12.0 **7** or later, with location enabled and a camera. They would also be able to connect that phone to the internet through either Wi-Fi or a mobile data plan. The developer hardware requirements are a computer that can connect to the Internet and we are hosting our database server through Firebase online so we will not need a physical server. We will also use an emulator through Android Studio so all of our testing on the app will be done through computers. There is no other hardware necessities we expect that we will need for this project besides these stated above. |
| **SOFTWARE EMPLOYED** |
| The software that will be required to complete this app, includes but is not limited to, Kotlin for the mobile application front end, Firebase for user authentication and management, JavaScript for connecting the backend to the users (ex. Push notification triggers), Android Studio for developing the application, Visual Studio Code for developing the backend cloud functions, Internet access for connecting users to the data as it comes in, Geo-location and Geo-fencing**8** to ensure users are in the correct location for events, Camera for being able to scan a QR code as a backup form of validating attendance, and HTML for creating a web dashboard for admins to create / modify events and rewards. |

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| **TIMELINE / MILESTONES** | | | |
| **OVERVIEW** | In order to all be on the same track, as well as provide a rough guideline of how our project should be moving along, we created a list of all key points as well as an expected deadline. We plan as a team to hit each and every deadline, and have allotted a little extra time for if any hiccups arise. This will serve as the official plan of action for our team, and it will be used to ensure all members are up to speed with all the requirements of our project. | | |
| **MILESTONE** | | **Member Responsible** | **DEADLINE** |
| Establish communication and create a GitHub | | All | 2/2 |
| Project Proposal submitted and Accepted | | All | 2/11 |
| Acquire Firebase account | | All | 2/18 |
| Configure Android Studio | | All | 2/18 |
| Research Kotlin, Geofencing and Firebase | | All | 2/25 |
| Design User interface and layout | | All | 2/25 |
| Create a database schema for accounts and events | | All | 2/25 |
| Set up Database with Firebase | | All | 3/3 |
| Create Student account registration and login page | | All | 3/10 |
| Create an Admin Login Page | | All | 3/10 |
| Design points system | | All | 3/10 |
| Develop a leaderboard and reward system | | All | 3/17 |
| Test Registration, Login and Point Earning | | All | 3/17 |
| Finalize front-end design | | All | 3/24 |
| Establish Geofence/ QR verification methods | | All | 4/7 |
| Testing with Test event | | All | 4/8 |
| Solve Bug issues | | All | 4/22 |
| Add event Data to databases | | All | 4/22 |
| Categorize events | | All | 4/22 |
| Final Tests and adjustments | | All | 4/29 |
| Finalize documentation | | All | 5/2 |
| Presentation preparation | | All | 5/3 |
| Final Submission and Presentation | | All | 5/3 |

**DEPLOYMENT / WORK DISTRIBUTION**

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| **DEPLOYMENT / WORK DISTRIBUTION** | | | | |
| For our work distribution, we plan to deploy a decentralized, polymorphic approach. Given this is a short project and our skillsets are similar and not specialized, we decided this was the wisest decision. An exception to this will be Shawn, who has experience in Android app development and Kotlin – he will be heading the backend development with all other members assisting. Our app development will be mostly organized via a Kanban style board on GitHub. Our schedule will determine the work that needs to be done, a member will take a card to work on, and all other team members will be there to help and assist in any way we can. We also believe this to be the best approach because it leaves the most flexibility and ensures the workload is the most evenly distributed among the group. | | | | |
| **TESTING PLAN** | | | | |
| This phase will test the functionality of the newly added features in three iterative testing cycles: first, we will test user registration, login, and point earning to ensure users can successfully sign up, sign in, and earn points for activities. After making improvements, we will finalize the front-end design and test the full experience of finding, registering for, taking, and submitting a test. In a final round of testing, we will validate all features and flows with diverse test cases to solve the remaining bugs and optimize usability based on feedback. Throughout the process, we will conduct testing in phases with time after each to fix issues before moving to more complex tests. This approach will allow us to validate all app components and improve the product through continuous iterative testing and refinement of the product. | | | | |
| **EXPECTED/PRELIMINARY RESEARCH** | | | | |
| The research required for the app will involve reviewing documentation and tutorials for Firebase, Kotlin, and int, Kotlin, and integrating geolocation services. We will research Firebases' real-time database, authentication, hosting, and storage solutions to support user profiles, event data, images, and more. For Kotlin, we will study language reference material and best practices for Android development. Research on GitHub will allow us to implement version control and collaboration workflows. Additional research may cover linking the domain and SSL certificate for security, leveraging GitHub will allow us to cover linking the domain and SSL certificate for security, and leveraging Github’s project management functionality. | | | | |
| **SUPPORT NEEDED** | | | | |
| Our project will benefit greatly if we use our support to the maximum potential. We would love the chance to work with any of the professors in the faculty and believe that they will be a huge help in what we are able to deliver and what our group is able to accomplish. We have already begun to ask questions and will continue to need the support of Professor Maurer and Haley. There has been great instruction and clear directions so far and we know that will continue and be able to clarify any questions we might have that come up in our development. Our group would love any support we can receive. | | | | |
| **PROJECT TRAINING NEEDED** | | | | |
| This project will require many of our members to do some training on the app development tools that we will use in this project. We will need to be very comfortable using the industry standard Android Studio with Kotlin **9** and experimenting to get the desired result for our application. We also plan on using Geofencing to authenticate if a user attends an event, we have to train ourselves in methods to use Kotlin in a way to track location at a certain place and time that we want to confirm a user's location. We also need to train ourselves on Using Firebase to manage our databases and connect to our application to be able to authenticate users and add events through it. We have a lot of training to do to make sure we are able to complete this project, but we will be able to get it done. | | | | |
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| **Project Phases** | | | | |
| **OVERVIEW** | Our team has estimated that we can develop a functioning Android application within twelve weeks. Our plan is split into five different phases, conceptualization/research/familiarization, design, development, testing, and presentation. Our team will rely on continuous effort and communication from each member. Members will pull tasks from our backlog of each phase as tracked on our GitHub kanban board. | | | |
| **PHASES/AREAS AND TEAM MEMBER/S RESPONSIBLE** | | | | **EXPECTED TIME INVESTMENT** |
| Conceptualization, Research and familiarization: All members | | | | 2 weeks |
| Product Design | | | | 1 week |
| Development | | | | 7 weeks |
| Testing and troubleshooting | | | | 2 weeks |
| Presentation | | | | 5 days |
| **ESTIMATE TOTAL** | | | | 12 weeks 5 days |
| **DELIVERABLES** | | | | |
| The aim of this Android mobile application is to provide organizations (such as universities) with a platform to advertise and incentivize the organization’s events. The app will allow organization administrators to create event listings. Members of an organization (users) will see upcoming events and earn points towards rewards by attending these events, as verified by geofencing, on a user-friendly interface. Members will also be able to collect various badges for attending various events. | | | | |

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| **TERMS & CONDITIONS** | |
| By completing the project proposal above, you are agreeing to the terms that you have done preliminary research (cited inline and below) about the needs for your project and the current market that it would be competing in. You also agree to the conditions that what you write will be adjusted by the faculty if it is believed to be inadequate or too difficult. Upon submitting the final version, you agree that your project will follow the project outline listed within this document to its full completion. Failure to do so will result in potential loss in points and failure of capstone. You hereby agree that all work in the project is the sole responsibility of the team and its members. | |
| **FIRST DRAFT DUE BY** | February 11, 2024 |
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| **ACCEPTANCE OF PROPOSAL** | | | |
| **AUTHORIZED CLIENT SIGNATURE** | GILLIAN MAURER, COURSE DIRECTOR | **DATE OF ACCEPTANCE** | [WILL BE FILLED IN LATER] |

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| **Work Cited:**  Castleberry, S. B., & Espel, S. (2018). Student Attendance At Campus Sporting Events: How Can We Get Them There?. *Journal of Business Case Studies (JBCS)*, *14*(4), 33–38. https://doi.org/10.19030/jbcs.v14i4.10202 |

1. <https://blog.collegevine.com/breaking-down-the-4-tiers-of-extracurricular-activities>
2. <https://cssl.osu.edu/research-projects/involvement-study>
3. <https://www.insidehighered.com/news/student-success/college-experience/2023/09/22/survey-barriers-college-students-campus>
4. Castleberry, S. B., & Espel, S. (2018). Student Attendance At Campus Sporting Events: How Can We Get Them There?. *Journal of Business Case Studies (JBCS)*, *14*(4), 33–38. <https://doi.org/10.19030/jbcs.v14i4.10202>
5. <https://firebase.google.com/products/auth>
6. <https://www.oodlestechnologies.com/blogs/prevent-gps-spoofing/>
7. <https://www.android.com/android-12/>
8. <https://developer.android.com/develop/sensors-and-location/location>
9. <https://developer.android.com/modern-android-development>