# Feasibility Study

Group B32 - Library Wayfinding

## Technological

The concept we are planning to use revolves around 3 distinct components. Firstly, an Android app will be created for customers to be used when interacting with our system. Employees will have access to a separate Android app where they can modify the locations of beacons and create announcements. Android was chosen as a platform since some members of our group already have some experience with coding Android apps and have access to the resources needed to develop an app - specifically, an Android phone. Additionally, since Android is a very widely used mobile operating system, we're confident that most clients should understand and be able to use our app. For the sake of keeping the prototype simple and keeping a reasonable timeline, the prototypes will only be Android apps - however, an actual implementation of our concept would have both Android and iOS apps to allow almost any modern phone to interact with our beacons. Since the customers will provide the phones, our costs are kept down. The only cost for creating apps is the time and training needed since the development tools for Android are free to use.

The third and final component of our project is several Bluetooth beacons. For these beacons, we chose to use Bluetooth because of several advantages it had over the competing technologies including, but not limited to, Wi-Fi, Infrared LEDs, and Ultrasonic beacons. While all of those were technically feasible, Bluetooth has already been tested and proven to work well in several other indoor navigation systems around the world. Additionally, most phones are compatible with Bluetooth since it's a very widely used protocol in contrast to Infrared, which only a comparatively small amount of phones have a receiver for, and ultrasonic sound signals, for which it would be impossible to check compatibility without finding the specifications (the maximum frequency) of a phone's microphone to see if it can even hear the sound signals. Finally, Bluetooth chips are inexpensive - both as an Arduino or Raspberry Pi add-on for easy prototyping and as standalone beacons for final implementation, allowing us to prototype while remaining within our financial restrictions.

## Economic

The project will be funded by two main sources. The first source is $100 from the University of Ottawa to build our initial prototypes. The second source is the Morisset Library budget, if our prototype is satisfactory, they will provide money toward the implementation of the system in the library. One financial constraint we are bound by is the $100 we have for designing two prototypes. This is a constraint because for our system to work we need at least 3 beacons to do triangulation. The project is financially attractive for our clients, the librarians, as they do not need to financially invest in the project unless it is a success. On the other hand, the University Of Ottawa is invested in us, with a 0% return on investment. This is because they are allocating funds towards teaching, rather than for return. They still benefit, but not financially.

## Legal

Our concept will adhere to all laws and regulations in our country and university. This is because the software we intend to use is available to anyone for any use as long as we adhere to their terms and services. This includes, not using the software to breach privacy, malicious

intent, and use on other platforms such as IOS. There are currently no agreements we are bonded to that may interfere with the completion of the project, along with no pending legislation that could prevent our projection from completion.

### Organizational

We will maintain our current procedures for meeting two to three times a week. This has so far proven successful, for time management, and the success of tasks. We additionally will continue to use Notion and Microsoft Teams, to organize tasks and due dates. One member of our team will undergo training and learning of app development, along with how to interact with Bluetooth beacons. Two members of our team will learn 3D cad design, to assist in the designing of our prototypes and final product. The remainder of the team will learn how to map out and develop a functional navigation system using triangulation. Over the remainder of the semester, we will change our policies and organizational strategies as we see fit, to achieve our goals, in a time-efficient and successful manner.

### Scheduling.

We're currently utilizing two task management applications to effectively keep track of and keep updated on the various tasks and deadlines required to complete the project in a timely manner. Since our team consists entirely of undergraduate university students, we have many time conflicts such as work for other courses, job applications for co-op, and exams. While we cannot craft a perfect plan since our time conflicts change frequently, we have decided to meet two or even three times per week to discuss deadlines and project details at a pace that allows us to adapt our timeline just as quickly as those rapidly changing time conflicts.