### Project Research

1. What service(s) will the system provide?

Keeping Track of buses running, number of students traveling in a bus, rating drivers, payment through the app, information on route stops and timings, store information regarding transactions, buses running, and students traveling. Also saving transportation resources: calculating how many buses needed for each route and how many students will travel through each route so there’s no wasted resources.

1. Who are the main stakeholders and end users?

Stakeholders - The third party transportation company, AIU representative to the transportation company, AIU transport unit.

Third-party transportation company - The company is responsible for the physical transportation for Students, faculty members, and other AIU staff and as such is an important stakeholder in the process. They are expected to ensure that the goods are transported in a timely, efficient, and safe manner, and to provide regular updates to the AIU representative.

AIU representative to the transportation company - This person is responsible for communicating with the third-party transportation company. They act as a messenger between the transportation company and the AIU transport unit, and are responsible for ensuring that the process is done right.

AIU transport unit - This unit is responsible for overseeing the entire transportation process. They are expected to ensure the quality of service, and provide feedback to the AIU representative if there are any issues. They are also responsible for ensuring that payment is made to the third-party transportation company for the services provided.

End users - Bus drivers, students traveling to and from the university, AIU transport unit to keep track of financials and student registration.

1. How are you going to find users to communicate with throughout the design and development of the project?

Send out a mass survey asking users for features they would like to see and work on small releases implementing those features one by one and giving users access to the website and select users who filled out the form will be able to test out the app on their mobile device.

1. Who are the potential users that you have access to? (These will provide user stories, and will share feedback throughout the development process).

Students, faculty members, and other AIU staff traveling from Alexandria, Cairo, and other locations to and from the university

Those who travel daily to and from the university get updates on the location of the bus every morning through the whatsapp group or by calling the driver every few minutes. The bus makes its stops to take students along the designated route (sometimes it waits for an unestimated long time at the stops), then reaches the destination (the university), And at the end of the day everyone gets on their bus and leaves.

1. What communities is the system going to serve? What demographics? What locations?

Student population (17-23 years age), faculty members, AIU administrative and other staff (26-65 years age) mainly hailing from Alexandria, Cairo, Mansoura, Behira and Damanhour, etc.

1. How are you going to solicit user input in the initial phases of analysis and design?

Get extensive feedback from users through a dedicated form on the website and the app responsible for collecting data across different factors including ease, speed, user-friendliness, and effectiveness of the application.

1. What is "new" about the system? Is it the idea of it, or is it the way it approaches a solution that already exists?

Bridging a gap between users and the drivers/administrators to build a seamless system of creating and managing bookings. The users will be able to track the buses, see information on different bus stops, link their payment method to the app, rate the drivers and administrators/drivers will be able to get useful data on the trends about the transportation system, understand user behavior on how to improve the system,and create a reliable channel to operate on.

1. What are the other systems that have goals similar to your system (mention some examples)? What criticism do you have about them? How do you think your system will be different?

Blacksburg Transit - The information about the stops is usually incorrect with the app taking forever to load and no support if there are any issues with the app. The app’s map view is not user friendly and new users have a hard time figuring out how to navigate through the app.

Salek - Signing up is a difficult process, the application is laggy, there’s no clear way on how to purchase packages.

Sobek Transit - Will use satellite view to give more accurate information on the bus routes and the map will update every 10 seconds to provide the latest information about the whereabouts of the bus. Users will have the ability to get notifications for certain routes and will be alerted when the bus is 10 minutes away. The app will maintain a history of the users last 5 trips to get assistance with and re-book the same trip efficiently. The app will be user friendly and will instruct users on how to use the application correctly.

1. What platform(s) will your app support?

Most internet browsers running a Javascript engine will be able to access the website and iOS Devices including Macbook, iPhone, iPad, Apple Watch, and Apple TV.

There’s a possibility that android devices will be supported.

1. If your system is an app, why does it have to be a mobile app (not a desktop or a web application)? The desktop app will not be very practical, while the mobile app will create user specific information about trips and will be able to pay through the app.

Most of the users will be students and AIU faculty who will be equipped with a smartphone in majority cases which makes it easier for them to open the app quickly and get necessary information. The app will make it easier to book trips by recommending destinations from the user’s trip history, getting an update on the bus location, link payments through the app, getting an estimated amount of time of how long the bus will take to reach a certain stop. All these features are most helpful through a mobile app.

1. What are the data, ML, and algorithmic aspects of the proposed system?

Financial Transactions, User information including unique iD, payment type used, bus used, and dates of travel. Routes of buses, information about bus stops, and any changes in the routes due to construction or holidays. The administrators/stakeholders will be able to learn about user behavior through this data and target investment/energy towards areas of improvement.

1. How are you going to test your system (prototypes and final product)?

The website and the app will go through rigorous testireng by the developers using SwiftUI testing framework for the app and Jest for testing API endpoints and JS code. The users will be able to provide crash reports and any feedback through the website and the app.

1. What software tools will be needed for app development? What skills do your team currently have towards building that app? What skills are still need to be acquired?

Software - Xcode, VSCode, Postman, Heroku, Github.

Skills - SwiftUI, HTML, CSS, JavaScript, React, Jest, Node.js, MongoDB.

Skills needed to acquire - Java for Android Development, SwiftUI kits, Jest, and SwiftUI testing.

1. How do you think your app will gain money? What is the initial business model of your project? What are your initial thoughts for marketing your app?

For every transaction the app will charge a service fee 10% and during high demand the service fee might increase but will never be more than 20% for transactions. This service fee will cover database and api deployment as well as cover the cost of the app on the app store which is a yearly fee.

We will use in house marketing asking for publications in AIU voice club, AIU website, and physical posters around campus. Posters on the bus and bus stops will attract users in using the app.

1. What skills do your team members have to work on this system? What skills are missing and you'll need to learn to deliver the system? How are you planning to obtain such missing skills?

We have the privilege to have an onground team which will ensure smooth conversation between the AIU administrators and the developers. Due to our extensive experience in web development and mobile apps with graphic designing we will be able to target the required audience and understand their needs. Since more than half of the team will also be the end user of the app we will get honest and valuable feedback from the team itself.

We will use a mix of Scrum and XP approach to stay on top of our internal deadlines with a mindset of embracing change and focusing on small releases to get the user feedback. We will need to learn deeply about the scrum process to ensure an efficient working environment and feedback. We intend to pair program and do daily scrum meetings paired with an end of the day check-in meeting to write our intentions for the next iteration in our trello board.

