TROJAN LIVING

USC Housing Mobile Application

TEAM MEMBERS

AVISHEK BANERJI

LAWRENCE BOWENS

PRANAV KARTHIKEYAN

SAMANTHA TIEU

YUHUA DI

SHUOLIN WANG

Project Charter

USC's location, being south of downtown Los Angeles, generates many issues for prospective and current students that seek housing. Because of its placement, students are tasked with locating available housing and competing with individuals unaffiliated with USC for those already limited housing units. Finding roommates or desirable living situations is another issue that plagues both current and prospective students. As students, many individuals are already preoccupied with trying their best to make the most of their student lives, they do not have extra time to navigate the real estate market of the greater Los Angeles area.

To help our community, we seek to develop a mobile application that will help students easily find readily available housing, while bringing together like-minded individuals. Additionally, we aim to make the process simpler for students who are looking to buy and sell household goods. We will develop a joint operation mode with the relevant USC platform to get access to valid and most up-to date information for students. The application will provide three main functions: the contracting of available units with landlords of the LA area for USC students, the compatibility system that will match students with similar interests and preferences together, and the thrifting of household items among the USC. The system shall be managed through student portal (app/site). Safety of personal data and information are guaranteed within the system.

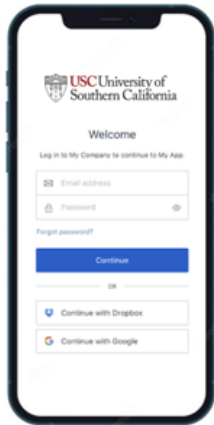To implement this system, several high-level requirements shall be met in the process:

- Contract landlords in the LA and greater LA area that are interested in renting their properties to USC students.
    - Properties that were contracted with USC, will be made available for students seeking residence.
    - Mobile App will provide pictures and details of units available.

- A questionnaire will be provided for student's seeking individual and roommate housing
    - Students seeking roommate housing will be matched with others of a compatibility rating of 70% and above. Students will then be put in contact with another to allow for discussion of living situations
    - Students seeking individual studio-like student housing will be asked to fill out a questionnaire on their preferences of location and budget. Available units that match their preferences will be listed for further inquiries.

- A separate portion of the application will be allocated for the buying and selling of student goods.
  - Students looking to sell household items will be able to upload pictures, set prices, and negotiate with potential buyers (fellow students)
  - Students looking to buy goods from other students will be able to bid and negotiate with sellers.

- Mobile application will be made to be desktop friendly
  - Features specific to mobile applications will have a similar function on desktops.
  - Layouts for specific functions may differ.

- Security for the application will be set in place.
  - Mobile application will use up-to-date USC security to ensure the protection of student privacy and data.
  - Students will be able to control what information, aside from essential information, is able for viewing.

- Student Profiles will be created for students looking to use application.
  - Student ID's will be uploaded to create profile for USC system
  - Student profiles may not be made available for landlords, until permission from students is granted.

- Student Affairs will be contracted to assist individuals facing issues.
  - Students finding themselves in difficult circumstances due to changes in their personal lives will be able to reach out to experts at Student Affairs to find solutions
  - Experts at Student Affairs will have access to inner workings of the mobile application to help find the best-case solution for students facing life changes.

- Marketing will be done prior to and during application launch
  - Marketing team(s) will develop a strategy to let both students and landlords know what application has to offer.

With ambitious expectations for our mobile application, we anticipate some challenges. Some challenges for the application may include unanticipated software issues, insufficient testing, external changes to human resources. However, given the extensive resources that USC has available, whatever challenges happen will be solved in a timely manner. The overall budget for our mobile application will be $3,500,000.

Work Breakdown Structure

Fig. Work Breakdown Structure

PLANNING

Developing a holistic plan that helps ensure that the USC housing application will be successfully completed on time and within budget.

1. **Scope**
    - Deliverables: (1) To develop a mobile application for USC students to find roommates (2) Selling of used goods amongst students communities
    - Cost: $75/hour for 1 board member
    - Time: 10 days
    - Resource Needs: Board of Directors (CEO, CFO, CTO, COO, Managing Directors)
    - Milestones: Clear objectives with communication with all team members of the company

2. **Market Research**
    - Deliverables: (1) Finding strategic insights of the quantitative metrics – Number of housing locations, transportation and connectivity to USC, Measuring the safety of students, connectivity to market place, Competitors in selling used goods, pricing strategies used

by other housing/used goods seller competitors (2) Finding relevant/accurate details on the housing situation and problems faced by students in Los Angeles through surveys and focus groups (3) Collection of data for analysis and market evaluation

- Cost: $20/hour for 1 Research Analyst
- Time: 21 days
- Resource Needs: Research Analysts (2)
- Milestones: Proper documentation and reports of the deliverables

3. **Resource Planning and Scheduling**
   - Deliverables: (1) Use Microsoft Project to build a schedule and assign tasks to each team (2) Make readjustments by using leveling to not over allocate work (per week 40 hours) (3) To explicitly specify overtime, weekend work days in the schedule (4) Specify each task milestones (5) Have communication strategies (Emailing) and weekly update (Zoom meetings) to concerned team leads
   - Cost: $35/hour for 1 Planning manager
   - Time: 30 days
   - Resource Needs: Planning managers (2)
   - Milestones: (1) Detailed Project Schedule with a start date and deadline to each task and entire project (2) Task expectation and goal to clearly carry out the work (3) Roles and responsibilities of each task (4) Communication methods to keep authorities and stakeholders updated

4. **Risk management, Contingency and mitigation planning**
   - Deliverables: (1) Formation of risk matrix in Excel which defines – Risk, Description of the risk, Probability, Impact, Mitigation plan, Contingency plan, Issues, point of contact, Resources involved
   - Cost: $75/hour for 1 board member
   - Time: 30 days
   - Resource Needs: Board of Directors
   - Milestones: Well defined Risk matrix

5. **Status Reporting and Progress Monitoring**
   - Deliverables: (1) Utilize emails for reporting and updating authorities/stakeholders/sponsors weekly about the progress of project (2) Alternate week day meeting calls on Zoom with the team leads for clarifications and updates (3) Weekly meetings on Zoom with the entire team to understand the standings of each team and work forward
   - Cost: No cost involved
   - Time: 14 days
   - Resource Needs: Entire team
   - Milestones: Setting a well-documented status report technique and a framework that the company follows to report work progress

6. **Budget Estimate (Financial Planning)**
   - Deliverable: (1) Create Budget plan using MS Excel (2) Research on current salaries/cost on employees with certain skillset and experience, software licensing, set up costs.
   - Cost: $75/hour for CFO and $35/hour for financial analysts
   - Time: 60 days
   - Resource Needs: CFO, Financial Analyst
   - Milestones: Estimate of the Budget and allocation per team, material and equipment

7. **Implementation Plan**
   - Deliverable: (1) Create strategies post launch in terms of operations, maintenance, finance, advertising and marketing (2) Prepare an additional schedule post deployment on Microsoft Project
   - Cost: $75/hour for 1 Board member
   - Time: 45 days
   - Resource Needs: Board of Directors
   - Milestones: Complete Implementation plan that includes – Budget, Operational and maintenance updates, marketing/advertising strategies, time estimation

8. **Project Plan Documentation**
   - Deliverable: (1) Complete detail of entire project with deliverables in the form of a report (2) Should include scope, budget, costs, schedule, time estimation, requirements, resource roles and responsibilities, assumptions, risks management, mitigation and contingency planning, organization structure, quality approaches, communication plan, project methodology, approach, milestones and approval matrix
   - Cost: $75/hour for 1 Board member
   - Time: 65 days
   - Resource Needs: Board of Directors
   - Milestones: Complete report of the planning phase

DESIGN (APPLICATION DEVELOPMENT)
This phase depends on the design of the USC housing application. This involves various steps of forming the design, building the code and debugging it.

1. **Requirements gathering**
   - Deliverable: (1) Licensing software for design, coding and testing (2) Selecting vendors to supply tools for design work and programming – App Development (Android Studio, Swiftic, Adobe Photoshop, Illustration, XD); Programming (Visual Studio, HTML, CSS, JavaScript); Cloud storage for database management (Oracle, Microsoft SQL Server, AWS)
   - Cost: Software (Adobe subscription: $20/month, AWS Subscription: free trial for 60 days post which $900/year), $50/hour for 1 Software engineer and $60/hour for Software lead

- **Time**: 14 days
- **Resource Needs**: Software Engineers (3), Software Lead (1)
- **Milestones**: Gathering all above software and tools in each PC of the designers and programmers

2. **Building sketches, mock-ups and wireframes**
   - **Deliverable**: (1) Building prototypes of the UI of the application in Adobe Photoshop, Illustrations, XD (2) To get it the designs approved by the designer lead
   - **Cost**: $45/hour for 1 designer and $60/hour for 1 designer lead
   - **Time**: 25 days
   - **Resource Needs**: Designer (1), Designer Lead (1)
   - **Milestones**: (1) Approval of the design by the design lead (2) Approval to take it to the next step of coding and building the application

3. **Programming the application (Front End and Back End)**
   - **Deliverable**: (1) Build complete application with responsive button and no bugs (2) Prepare application for Android (Google Store) and Apple Store capabilities (3) Integration of the backend services with the APIs (4) Whole site functionality having response time in each function of less than 5 seconds
   - **Cost**: $50/hour for 1 Software engineer
   - **Time**: 60 days
   - **Resource Needs**: Software Engineers (3)
   - **Milestones**: Complete application

4. **Database management system**
   - **Deliverable**: (1) Integrating the student login database to the cloud (2) Describe techniques for analyzing, designing, modeling the DBMS system (3) A protocol for exchanging information from the web to the database (4) Able to store data without redundancy and provide key insights of customers
   - **Cost**: $50/hour for 1 Software engineer and $60/hour for Software lead
   - **Time**: 15 days
   - **Resource Needs**: Software Engineer (1) and Software Lead (1)
   - **Milestones**: Integration of all the information to AWS cloud platform

5. **Security System**
   - **Deliverable**: (1) Identification, assessment, mitigation and prevention protocols for cybercrimes and safety hamper situations (2) Implementation of Encryption Protocols (3) Removal of sensitive data from the code (4) Continuous testing of the code to find loopholes (4) Alert system for reporting cybercrimes (5) Check legal standards for security
   - **Cost**: $50/hour per cyber security expert and $45/hour for 1 Legal associate
   - **Time**: 20 days
   - **Resource Needs**: Cyber security experts (2) and Legal associate (1)

- Milestones: Established risk protocols and information security risk management standards

6. **Code Reviews**
   - Deliverable: (1) Code quality taking into consideration of Design, App development code, Database systems, and security system (2) Evaluation using code review tools and requirements
   - Cost: $60/hour for Software lead
   - Time: 10 days
   - Resource Needs: Software Lead (1)
   - Milestones: Fix all bugs and errors in code

TESTING

This phase involves the testing of the automation frameworks to identify bugs and to ensure smooth processing of scripts and other programming tools. To deliver easy functionality, usability and consistency of the requirements in the entire application to be approved for launch.

1. **Acceptance and Performance testing plan**
   - Deliverable: (1) Laying out functional and nonfunctional requirements for acceptance criteria, defining boundaries, plan, estimate in terms of technical details
   - Cost: $45/hour for 1 Software test engineer
   - Time: 15 days
   - Resource Needs: Software test engineer (2)
   - Milestones: Complete acceptance plan and testing procedures

2. **System Testing**
   - Deliverable: (1) Complete mobile application test planning (2) Testing Design (3) Testing in different environments – Apple store and Google Play Store
   - Cost: $45/hour for 1 Quality Assurance Engineer
   - Time: 15 days
   - Resource Needs: Quality Assurance Engineers (2)
   - Milestones: Success in all test cases

3. **Prototype Testing**
   - Deliverable: (1) Examine critical success factors (2) Test overall defects (3) Test execution and defect validation (4) Quality analysis of software code and modules (5) Link user stories to test cases (6) State overall product regression
   - Cost: $45/hour for 1 Quality Assurance Engineer
   - Time: 20 days
   - Resource Needs: Quality Assurance Engineers (2)
   - Milestones: Success in all test cases (or) achieving above acceptance criteria

4. **Issue/Bug Resolution**
   - Deliverable: (1) To solve issues and errors that came up during testing and all related bugs (2) Save Baseline (3) Provide defect prevention protocols for the future
   - Cost: $50/hour for 1 Software engineer and $60/hour for Software lead
   - Time: 10 days
   - Resource Needs: Software Lead (1), Software Engineer (3)
   - Milestones: Solve all issues found during testing

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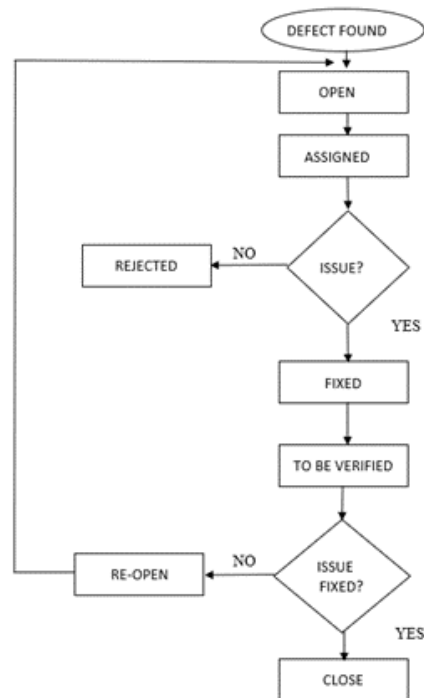
Fig. Issue/Bug Procedure

5. **Maintenance and Performance Updates**
   - Deliverable: (1) Laying out instructions' software update procedure for future maintenance and updates (2) System Administration, System Tuning, User Support and Helpdesk
   - Cost: $50/hour for 1 Software engineer and $60/hour for Software lead
   - Time: (Future planning)
   - Resource Needs: Software engineer (3), Software lead (1)
   - Milestones: Well documented action plan for future updates

6. **Server Management**
   - Deliverable: (1) Preparation and planning for 1- Software management 2- Security 3- Backups
   - Cost: $40/hour for 1 IT solution engineer
   - Time: (Indefinite time)

- Resource Needs: IT solution engineer (2)
- Milestones: Establishment of complete server management system

DEPLOYMENT

In this process, the USC housing application is installed and configured to the apple store and google play store which enables the application to be available for use.

1. **Release management and planning**
   - Deliverable: (1) Check Configuration management (2) Preparation for Rollout plans (3) Test communication (4) Anticipated timeframe for preparation. Planning and consultation
   - Cost: $75/hour for 1 board member
   - Time: 20 days
   - Resource Needs: Board of Directors
   - Milestones: Release of the application

2. **Help and training documentation**
   - Deliverable: Establish terms and conditions. Support and feedback, privacy policies, use agreements
   - Cost: $40/hour for 1 IT solution engineer and $45/hour for 1 Legal associate
   - Time: 7 days
   - Resource Needs: IT solution engineer (2), Legal Associate (1)
   - Milestones: Complete documentation

3. **Customer Service**
   - Deliverable: Set up customer service for reporting issues, analyzing customer problems and providing solutions
   - Cost: $25/hour for 1 Customer service personnel
   - Time: (Indefinite time)
   - Resource Needs: Customer service personnel
   - Milestones: Flow of customer calls, good feedback on customer service

MARKETING

To engage with the customers more and increase downloads, which would in turn increase the sales, certain marketing techniques must be taken to ensure steady growth of the application viewership and usage.

1. **Marketing Strategy**
   - Deliverable: Discuss marketing strategy to increase downloads, application usage and overall customer base
   - Cost: $40/hour for 1 Business Analyst and $25/hour for 1 Marketing Associate
   - Time: 15 days
   - Resource Needs: Business Analyst (2) and Marketing Associate (1)

- Milestones: Strategies for marketing, approved by senior management

2. **Brochures**
   - Deliverable: Develop brochures and pamphlets to be distributed across USC campus
   - Cost: $16/hour for 1 student
   - Time: 10 days
   - Resource Needs: Student job (5)
   - Milestones: Distribution of 5000 brochures

3. **Advertising**
   - Deliverable: Develop posters to be advertised in USC Instagram and Facebook handles, Connect SC and MyUSC
   - Cost: $16/hour for 1 student
   - Time: (Indefinite time)
   - Resource Needs: Students (5)
   - Milestones: 25,000 student viewership

Resource Plan

The resource plan consists of the Human Resources, Equipment Required and the Facilities needed for the project.

Human Resources

The primary Human Resources required for the development of the project and the additional resources required to support the project are listed below.

Resource Plan			
Resources	**Number Required**	**Cost/Hour**	**Responsibilities**
Chief Executive Officer (CEO)	1	$75	Head of organization and makes all the major decisions
Chief Financial Officer (CFO)	1	$75	Responsible for all financial activities and investments
Chief Technology Officer (CTO)	1	$75	Head of development of the technology
Chief Operating Officer (COO)	1	$75	Incharge of the operations and policies of the organization
Managing Director	1	$75	Manager of the organization and responsible for the application development
Research Analysts	2	$20	Work on finding the strategic insights of the quantitative metrics
Planning Manager	2	$35	Plan the project schedule and allocate resources
Financial Analyst	1	$35	Analyses the cost of operations and creates budget
Software Engineers	3	$50	Develop the frontend, backend and integrate the application, manage the database
Software Lead	1	$60	Manage the engineers and develop the application
Designer	1	$45	Design the user interface of the application
Designer Lead	1	$60	Manage and work with the designer
Cyber Security Expert	2	$50	Protect the application from any security breach and damage
Quality Assurance Engineer	2	$45	Tests the program after development and fixes the bugs before launch
IT Solution Engineer	2	$40	Manages the servers of the application and the organization
Business Analyst	2	$40	Analyses the market trends and suggests development strategies
Legal Team	Depending on work	$45	Advices in legal work and prepares documentation
Administrative Assistant	2	$30	Maintains the offices of the organization
Customer Service	1	$25	Help customers solve issues by providing solutions
Student Workers	5	$16	Assist the team in different tasks
Additional	**Resources**		
Payroll Coordinator	1	$25	Manages the payroll of all the employees
Student Workers	Depending on work	~ $16 to $25	Hired across various teams based on requirement
Marketing Associates	2	$25	Creates marketing material and develop marketing strategies
Human Resource Manager	1	$35	Work on maintaining staff, hiring and benefits of resources

Fig. Resource Plan

- The CEO, CFO, CTO, COO and the Managing Director are the Board of the Directors, Stakeholders and the leadership team of the project.
- Almost all the work is carried out by the internal employees and little to no work is outsourced.
- The legal team is hired whenever required, primarily for the documentation purposes.
- Student workers can be hired based on the support needed for the internal employees to meet the deadlines of each task and they are paid starting from $16 to $25 depending on the work they carry out.
- Student workers will be hired for tasks related to marketing, customer service and software development.

Equipment

- The equipment requirement is based on the number of employees.
- One laptop for each employee and a set of monitor, keyboard and mouse. Designers are allocated with two monitors.
- Software package licenses are purchased based on the responsibilities of the employees.
- Android Studio and Swiftic for software developers, Photoshop and XD for the designers.
- AWS Cloud resources are used from the USC subscriptions as servers and also to acquire computing power.

Resource	Quantity
Electronics	
Laptops	50
Monitors	42
Keyboards	40
Mice	40
Softwares	
Office 365	60
Android Studio, Swiftic	5
Photoshop, XD	2
AWS Cloud	Org. Subscription
Furnitures	
Desks	50
Chairs	50

Fig. Resource Plan

Facilities

- Two offices are required for the organization. One being the front office in the university and the other one being the workplace. One administrative assistant will manage the functioning of each office.
- One meeting room for each team and 2 conference rooms.
- Workplace for 50 employees, which can be used by primary resources and the additional available workplace can be used by the supporting student workers.
- Refreshments for the employees to be placed in the different locations of offices.

Check the Resource Usage View pdf for more information on the task allotted to each resource.

<u>Organizational Structure</u>

Functional organizational structure is used in this project. In this project, several roles need to collaborate in their assigned tasks. The functional organizational structure redivides the whole team into five parts: Technology Team, Operation Team, Marketing Team, Management team, and Legal Team. This kind of structure allows members of relevant roles to engage cross-functional teams, which promotes communications among members and breaks down silos across traditional departments. At the same time, resources can be allocated optimally. And the project objectives could always be kept at the forefront.
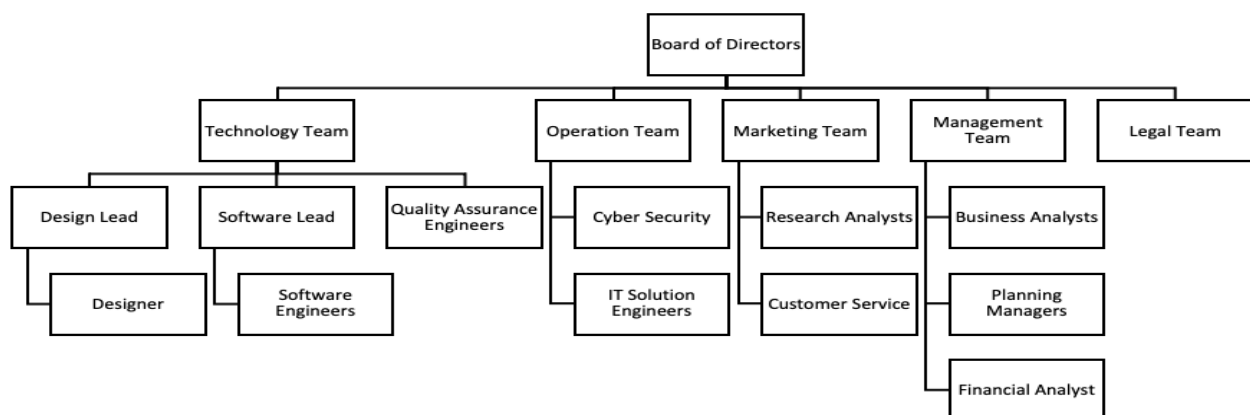
<u>Organizational Chart</u>

Fig. Organizational Structure

Role Descriptions

Board of Directors (CEO, CFO, CTO, COO, Managing Directors)
- Creating a project plan and product rollout plan
- Scheduling and supervising team meetings
- Performing risk assessment
- Creating budget plan with Financial Analyst
- Maintaining project documentation and reports
- Monitoring project status

Design Lead/Designer
- Designing look and feel of the application and website
- Creating all visual and audio assets for the project, including color schemes, graphics, animation and so on
- Collaborating with developers to ensure that the final product fulfills the objectives
- Collaborating with QA team to identify potential usability issues and vulnerabilities
- Sending timely updates to the authorities and Design Lead
- Overseeing designer to accomplish these tasks

Software Lead/Engineer
- Selecting and maintaining design and programming tools
- Defining coding standards to be maintained during the project
- Creating and implementing the source code of the applications and website
- Developing technical handbooks to represent the design and code of new applications
- Collaborating with designers to ensure that the final product fulfills the objectives
- Collaborating with QA team to fix bugs and correct errors
- Integrating backend services with the APIs and information to cloud platform
- Sending timely updates to the authorities and Software Lead
- Overseeing engineers to accomplish these tasks

Quality Assurance Lead/Engineer
- Establishing a testing process to identify bugs and problems quickly and accurately
- Performing manual and automated testing to identify bugs and shortcomings various stages of the development cycle
- Creating detailed reports on bugs and how to fix them
- Collaborating with Technology Team to identify potential usability issues and vulnerabilities

Cyber Security
- Implementing Encryption Protocols
- Detecting and removing sensitive data from code
- Performing manual and automated testing to identify loopholes various stages of the development cycle

- Building alert system for reporting cyber crimes

IT Solution Engineer
- Establishing terms and conditions, including support and feedback, privacy policies, and user agreements
- Working closely with Technology Team to ensure hardware is available for projects
- Documenting and monitoring requirements needed to institute proposed updates in relation to customer experience

Research Analyst
- Creating strategies to drive users and attract advertising
- Conducting market research and capturing the needs of users
- Generating user feedback reports

Customer Service
- Providing support to both prospective and existing customers
- Collecting and analyzing customer feedback
- Providing proactive customer outreach
- Handling customer complaints

Business Analyst
- Monitoring the project status and communicating technical requirements between project manager and technical leads
- Collaborating with marketing team to assess the users' needs and translate into product features

Planning Manager
- Creating a project schedule including milestones
- Assigning specific tasks to individual team members
- Responsible for resource allocation
- Sending timely updates to the authorities and team leads

Financial Analyst
- Creating budget plan with CFO
- Monitoring current salaries and cost in project

Legal Team
- Drafting and approving document layouts
- Keeping activities in strict compliance with new legislation
- Complying documentation with existing local/international agreements and legislation

Project Schedule

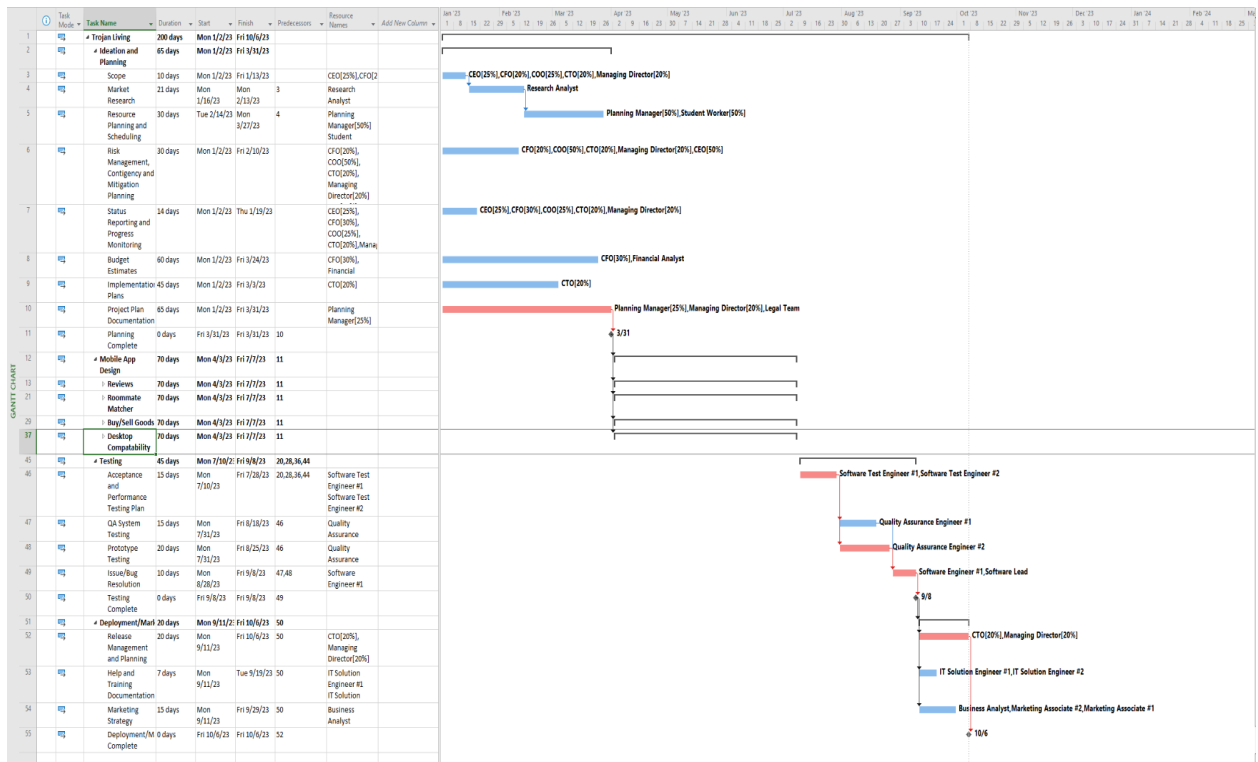**Fig**. Project Schedule

Project schedule is provided above with a critical path highlighted. The project schedule (.mpp), resource usage sheet, and resource cost sheet are provided in separate deliverables as well for reference.

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USC Housing Mobile Application (Part 2)

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Project Budget

Project Assumptions

Assumptions made in the budget

1. **Over-all Budget:** The assumption is that USC will be willing to invest in the development of this mobile application for $3,500,000.

2. **Personnel:** The entirety of the development will be run by a combination of faculty, professionals, and USC student workers contracted at an hourly rate for the duration of the project. The assumption is that the sum of the following hourly expenses will remain under budget:
   a. The Board of Directors include a CEO, CFO, CTO, COO, and Managing Directors. The assumption is that a faculty member/professional would be willing to occupy each position at $75/hour.
   b. 2 Research Analyst positions are assumed to be occupied by faculty members/professionals at $20/hour each.
   c. 2 Planning Manager positions are assumed to be occupied by faculty members/professionals at $35/hour each.
   d. 1 Financial Analyst position is assumed to be occupied by a faculty member/professional at $35/hour.
   e. 3 Software Engineer positions are assumed to be occupied by faculty members/professionals at $50/hour each.
   f. 1 Software Lead position is assumed to be occupied by a faculty member/professional at $60/hour.
   g. 1 Designer position is assumed to be occupied by a faculty member/professional at $45/hour.
   h. 1 Designer Lead position is assumed to be occupied by a faculty member/professional at $60/hour.
   i. 2 Cyber Security Expert positions are assumed to be occupied by faculty members/professionals at $50/hour each.
   j. 1 Legal Associate position is assumed to be occupied by a faculty member/professional at $45/hour.
   k. 2 Software Test Engineer positions are assumed to be occupied by faculty members/professionals at $45/hour each.
   l. 2 Quality Assurance Engineer positions are assumed to be occupied by faculty members/professionals at $45/hour each.
   m. 2 IT Solution Engineer positions are assumed to be occupied by faculty members/professionals at $40/hour each.
   n. 1 Customer Service position is assumed to be occupied by a faculty member, professional, or student worker at $25/hour each.

o. 2 Business Analyst positions are assumed to be occupied by faculty members/professionals at $40/hour each.
p. 2 Marketing Associate positions are assumed to be occupied by faculty members, professionals, or student workers at $25/hour.
q. 2 Administrative Assistant positions are assumed to be occupied by student workers at $30/hour.
r. 5 Student Workers are assumed to be recruited as assistants to varying tasks during the development at $16/hour each.
s. 1 Payroll Coordinator position is assumed to be occupied by a faculty member, professional, or student worker at $25/hour.
t. 1 Human Resource Manager position is assumed to be occupied by a faculty member/professional at $35/hour.
u. 10 Student Drivers are assumed to be recruited and willing to volunteer their vehicles at $16/hour each with the addition of transportation services.

3. **Overhead Expenses:** The following are assumptions made towards the costs of software, equipment, furniture, and office space required for the duration of the project:
   a. **Software:**
      i. 60 premium subscriptions of Microsoft Business for $22/month.
      ii. 5 subscriptions to Swiftic for $40/month.
      iii. 5 Android Studio licenses for $25 each.
      iv. 2 subscriptions to Adobe Photoshop for $20/month.
      v. 2 subscriptions to Adobe XD for $10/month.
      vi. An AWS organization subscription for cloud storage at $900/year.
   b. **Equipment:**
      i. 50 office laptops at $500 each.
      ii. 42 office monitors at $90 each.
      iii. 40 office keyboards at $15 each.
      iv. 40 office mice at $10 each.
   c. **Furniture:**
      i. 50 office desks at $100 each.
      ii. 50 office chairs at $50 each.
   d. **Office Space:** An office space that can be divided into a front and back space and can hold up to 50 employees for $37,000/month. This is an office space at approximately 9,750 square feet for $3.70/square feet in Los Angeles.

4. **Mitigation and Contingency Plan Budget:** +10% of overall budget

Project Budget						
			Year			
		2022		2023	2024	2025	2026
Personnel	Quantity	Cost ($)		Cost ($)	Cost ($)	Cost ($)	Cost ($)
		Cost/Hour	Total Labor Cost				
Chief Execute Officer (CEO)	1	75	12,600	13734	14970.06	16317.365	17785.928
Chief Financial Officer (CFO)	1	75	18,210	19848.9	21635.301	23582.478	25704.901
Chief Technology Officer (CTO)	1	75	14,280	15565.2	16966.068	18493.014	20157.385
Chief Operating Officer (COO)	1	75	12,600	13734	14970.06	16317.365	17785.928
Managing Director	1	75	16,680	18181.2	19817.508	21601.084	23545.181
Research Analyst	2	20	6,720	7324.8	7984.032	8702.5949	9485.8284
Planning Manager	2	35	17,500	19075	20791.75	22663.008	24702.678
Financial Analyst	1	35	16,800	18312	19960.08	21756.487	23714.571
Software Engineer	3	50	86,400	94176	102651.84	111890.51	121960.65
Software Lead	1	60	16,320	17788.8	19389.792	21134.873	23037.012
Designer	1	45	9,000	9810	10692.9	11655.261	12704.234
Designer Lead	1	60	12,000	13080	14257.2	15540.348	16938.979
Cyber Security Expert	2	50	16,000	17440	19009.6	20720.464	22585.306
Quality Assurance Engineer	2	45	14,400	15696	17108.64	18648.418	20326.775
IT Solution Engineer	2	40	4,480	4883.2	5322.688	5801.7299	6323.8856
Business Analyst	2	40	4,800	5232	5702.88	6216.1392	6775.5917
Legal Associate	1	45	23,400	25506	27801.54	30303.679	33031.01
Administrative Assistant	2	30	12,600	13734	14970.06	16317.365	17785.928
Customer Service Representative	1	25	9,600	10464	11405.76	12432.278	13551.183
Student Worker	5	16	75,000	81750	89107.5	97127.175	105868.62
Payroll Coordinator	1	25	9,600	10464	11405.76	12432.278	13551.183
Marketing Associate	2	25	9,600	10464	11405.76	12432.278	13551.183
Human Resource Manager	1	35	16,800	18312	19960.08	21756.487	23714.571
Student Driver	10	16	75,000	81750	89107.5	97127.175	105868.62

Software	Quantity	Cost ($)		Cost ($)	Cost ($)	Cost ($)	Cost ($)
		Cost/Item	Total Cost				
Microsoft Business	60	22/month	15,840	17265.6	18819.504	20513.259	22359.453
Swiftic	5	40/month	2,400	2616	2851.44	3108.0696	3387.7959
Android Studio	5	25	125	136.25	148.5125	161.87863	176.4477
Adobe Photoshop	2	20/month	480	523.2	570.288	621.61392	677.55917
Adobe XD	2	10/month	240	261.6	285.144	310.80696	338.77959
AWS	1	900	900	981	1069.29	1165.5261	1270.4234

Equipment	Quantity	Cost ($)		Cost ($)	Cost ($)	Cost ($)	Cost ($)
		Cost/Item	Total Cost				
Laptops	50	500	25,000	27250	29702.5	32375.725	35289.54
Monitors	42	90	3,780	4120.2	4491.018	4895.2096	5335.7785
Keyboards	40	15	600	654	712.86	777.0174	846.94897
Mice	40	10	400	436	475.24	518.0116	564.63264

Furniture	Quantity	Cost ($)		Cost ($)	Cost ($)	Cost ($)	Cost ($)
		Cost/Item	Total Cost				
Desks	50	100	5,000	5450	5940.5	6475.145	7057.9081
Chairs	50	50	2,500	2725	2970.25	3237.5725	3528.954
Other		Cost ($)		Cost ($)	Cost ($)	Cost ($)	Cost ($)
Office Space		333,000		362970	395637.3	431244.66	470056.68
Mitigation and Contigency Plan		1,950,000		2,125,500	2316795	2525306.6	2752584.1
Maintenance Costs		Cost ($)		Cost ($)	Cost ($)	Cost ($)	Cost ($)
Marketing		350,000		381,500	415835	453260.15	494053.56
Software Updates		0		150,000	163500	178215	194254.35
Hardware/Server Maintenance		0		50,000	54500	59405	64751.45
Total Cost		3,125,655		3,688,714	4,020,698	4,382,561	4,776,992

<u>**Figure 1:**</u> Trojan Living Budget

<u>**Assumptions made in planning (work breakdown structure)**</u>

1.   **Scope**: The main objective is to make a mobile application that is for the students of the University of Southern California (USC). This application would help students find roommates as per their interests and likings. In addition, the students can buy and sell used goods in the student community.

   a.   The assumption made here is that there isn't any other mobile application/website that helps the students of USC students with the above-said objective. We are not considering the presence of USC housing for on-campus housing. Our application is the first application to help students with the said scope and goals.

   b.   The time taken is 10 days, assuming that the board members are teachers and need to find time outside of educational activities to put into this venture. Building the scope is important as it is the building block of the entire project.

2.   **Market Research**: The main objective is the find out how many houses are available in and around campus within the DPS zone. So that there is ease for students to move around because of the safety provided by the DPS team. In addition, the Lyft service is accessible for students and thus, helps students to go around the DPS zone from 6 PM to 2 AM.

   a.   The assumption made here is that there are plenty of housing facilities to equip all the students of USC.

   b.   Another assumption made is that the information provided by the landlords of these housing facilities is authentic and will be willing to provide proof to the students if needed.

   c.   Another assumption made is that all the housing facilities are within the DPS zone, which will be able to house all students of USC.

   d.   The time given is 21 days because most of these works are done by students. Since only 2 research analysts are working, it will take time for them to travel around, make phone calls, and get information from all the housing facilities around USC.

3.   **Resource Planning and Scheduling**: This is one of the main parts of the project. 1 Planning manager will be working on it.

   a.   The assumption made here is that student workers and faculties are willing to work overtime if needed to complete the project on time.

   b.   Another assumption is that the person assigned to the task has the knowledge and experience of doing similar tasks and will be able to complete them in the given set time.

4. **Risk Management, contingency, and mitigation planning**: Here, a board member who is skilled in risk planning and management, who has been in the field and has experience will be making the risk plan.

    a. The assumption is that the company has all the resources and mitigations facilities to take care of the risk (if it becomes an issue).

    b. The mitigation and contingency plan will perform smoothly if there are any issues or any signs that show that an issue might come

5. **Status reporting and progress monitoring:** This is an important step in our communication strategy. The entire company needs to know, what the vision is and what steps are being taken to ensure that the progress is steady.

    a. The assumption made here is that all employees will be updating their work progress and status honestly and punctually.

    b. Another assumption is that the entire team will be present in each of the team meetings.

6. **Budget Estimate**: This is the backbone of the project. Having monetary funds is very essential to move ahead in your project.

    a. The assumption made here is that our company has enough money to fund the entire project, till it starts seeing profits. Moreover, the funding can be from USC or by crowd-sourcing.

    b. Another assumption is that budget being set is as on the student's salaries here at USC and not according to the salary in Los Angeles. This is because the mobile application will be run by USC students and faculties.

7. **Project Plan Documentation**: This step ensures that all the tasks done in the planning process are well documented and researched. It will record all the information carried out during the planning process.

    a. The assumption is that all the information here will be absolute. There will only change made if necessary. This shall be a manual for all the employees.

Assumptions made in Design (work breakdown structure)

1. **Requirements gathering**: It is necessary to have all the requirements before starting the project.

    a. The assumption made here is all the software/equipment that will be bought by the vendor will be functioning for the entirety of the project with no malfunctioning or breaking down.

    b. Another assumption is that all the software is checked thoroughly before being put to use. The checking is done by the software lead and then allowed for the software engineers to work on it.

    c. In addition, to the above assumptions, it is also considered that we have unlimited data space to save our workspace and save work.

2. **Building sketches, mock-ups, and wireframes/Programming the application**: This step is the onset of the designing stage.

    a. The assumption that has been made here is that the work done by the designers and designer lead is finished in the given time (25 days).

    b. Another assumption is that all the software will be working efficiently and will not cause any delays to the project schedule.

3. **Database Management System**: Data is key in this project. All the data are being saved in the cloud space (AWS Cloud platform).

    a. The assumptions made here are that all the work is getting saved in the cloud and there isn't any lag time in saving the information.

    b. Another assumption is that we have enough space to store all the information. That is to say that we have unlimited space to save work.

4. **Security System**: This is an essential step as there is personal information of the student that is being used by the company.

    a. The assumption made here is that we have the best cyber security software with updated technologies to tackle all cybercrimes and threats.

    b. We also assume that we are abiding by all the laws of the country in terms of cyber security and will be handled by the legal associate.

5. **Code Reviews**: We assume that during the last stage of reviewing the code, we can solve all the debugs and errors, to minimize threats and malware/hacking. We take into consideration that our software lead is experienced in these matters and will be able to optimize the code to make it very efficient.

Assumptions made in Testing (work breakdown structure)

This is an important step since prototype testing and user testing will help our company to improve the mobile application to become more user-friendly and smoother. With the help of feedback from different sources and testing, it is imperative to take action on rectifying the points that are causing issues.

    a. We assume that all testing is done in a safe environment and that while testing there are no threats or attacks that can be made.

    b. We also assume that at the end of the testing phase, we will be able to rectify all the issues and bugs in the application and will be ready for deployment.

Assumptions made in Deployment (work breakdown structure)

We made the following assumption in the deployment phase:

    a. We assume that the customer service team will be online 24x7 and will resolve all customer-related problems.

    b. We also assume that the application will be deployed in Google Playstore and Apple Store smoothly and users will be able to download it without any hassle on the day of release.

     c.   Another assumption made is that all the roll-out plans for deployment are done in the given set time and do not produce any delay.

Assumptions made in Marketing (work breakdown structure)

We made the following assumptions in the marketing phase:

     a.   The main intent of the marketing phase is to make the Trojan Living application popular. We assume that the advertising helps to outreach to 25,000 viewership within the given time

     b.   Another assumption is that with the increasing viewership, there is a steady increase in the downloads of the application.

Organizational Change Management Plan

Organizational Change Management Plan Overview

Currently, our company has many roles and opportunities available for individuals. However, it's been noticed that productivity is not as efficient as it can be. In order to drive up the level of productivity in the office, we intend to consolidate certain roles and responsibilities among our departments. To do this, an internal review will be conducted to determine the cause of the productivity slump. After the investigation, emails will be sent to departments and individual team members to notify them of ongoing decisions and changes. Likely changes that will take place are merging of the financial and business analyst roles. Because sudden decisions and changes will prompt confusion and anxiety, it is in the organizations best interest to ease members through the transitional period. Activities, such as focus groups will be available to help individuals through the process. Alongside group activities, human resources will be deployed to understand and alleviate concerns that are brought up. Additional training programs will be required for current and new members of the merged department to update individuals on new policies, procedures, and updated responsibilities. Mentoring and Coaching programs will also be available as a support unit for those requiring extra support during the adjustment period. After the transition period is over, successful deployment of change, iterations of feedback and support will still be granted such that longevity of adjustment is sustained and awarded.

Scope: Roles and responsibilities of business and financial analysts will be consolidated to improve revenue distribution and overall efficiency.

For the project and company to be successful, team members understand why changes in the organization are necessary. They are motivated to learn, work with, and interact with programs made available throughout the adjustment process. Team members will have a renewed sense of motivation and enthusiasm that align with the company and their own goals.

Stakeholder Engagement/Sponsor Roadmap

Business/financial analysts and other related positions are the ones that need to change. This is related to the nature of their careers. Business analytics focuses on converting large amounts of complex data, through quantitative methods and applied analysis, into reasonably clear, manageable information to make sound business decisions. Financial analysts are mainly employed in financial investment companies and securities firms. This is an optional position for IT companies. For our company's application, we need to lean more towards the data science analysis aspect, which is beneficial for the company. By combining finance and data to effectively analyze customer demographics, you can gain a comprehensive understanding of the mobile market, acquire and retain users, develop roadmaps, explore new markets, and optimize your return on investment. In order to achieve such a win-win situation, it is crucial to recruit and train staff. High efficiency, high quality, and high standards are the levels we need our staff to achieve. The volume and variety of data in the company continues to grow, and the rate at which data is generated every day is accelerating, which requires fast and clear analysis.

Change Map

Human Resources

The impact on human resources is double-edged. The reduction of relevant parts and positions is a deprivation of a small number of opportunities to be able to be employed, and a higher threshold of positions is the inevitable result. On the other hand, it can increase the salary to a certain extent for trained or newly employed people.

Human Resource is intended to help find solutions for overall staff and affected employees through change. They are knowledgeable in listening, understanding, and showing empathy for circumstances. Alongside finding solutions and other alternatives for staff that are unable to transition through organizational change.

Diversity, Equity and Inclusion

Blending people from different positions can help the company's team as a whole to be more cohesive. Because fewer people do more things, so that the boundaries between departments become blurred.

Corporate Social Responsibility/Community Relations

The original idea of this mobile app was to make it easier, more economical, and more efficient for USC students to live in the community. So the mobile app takes on part of the social responsibility, and being able to improve the quality of the software means more contribution to the community.

Operational Departments (Hiring Teams)

For operational departments, they need to draw up new staffing requirements for hiring relevant positions, and in particular, they need to assess their data science-related skills.

<u>Senior Leaders</u>

The integration of business and financial analysis is not to be underestimated. Leaders need to have a big picture and a sense of crisis. Such integration is important for the future investment and development of the company.

Resistance Management Plan

Candid conversations will be held with board of directors and team leaders at the beginning of the preparation phase on what their perceived challenges may be, what barriers exist, what potential resistance and behaviors may occur. Prospects for benefits and improvements will be estimated by top managers and focus group discussions, and then announced to employees and stakeholders. Necessary meetings will be conducted to analyze and share support and coaching that our organization provides to affected individuals and teams.

Organization Readiness Plan

Detailed procedures on company policies will be clearly communicated to individuals who are changing positions. Focus group will help lead the initiative. They are supposed to always keep an eye on the group attitude during the preparation phase, and identify any potential concerns or conflicts in position changing. Necessary meetings will be held to keep the team aligned and positive on the upcoming changes. All stakeholders will be kept informed of program progress, and their concerns will be addressed in a timely manner. A clear view of the pros and cons and blueprint of the program will be provided to all stakeholders and employees. A new project budget based on the changes will be provided by the financial analyst and CFO at least one week prior to the start of execution. Readiness dashboard/checklist will be available at least one week prior to the start of the execution, and will be updated continuously according to the concerns and related requirements. Mentoring and coaching will be provided to relevant employees, and training materials will be posted on specific webpage for everyone to have easy access whenever they need. Baseline procedures will be distributed, up to individuals to make it better.

Communications Plan

Emails will be sent out two weeks in advance to notify relevant departments and personnel of upcoming changes, including start time and expectation of their new responsibilities. A formal meeting will be held at the beginning of the change to announce specific timelines and scope throughout the organization. At the same time, program launch email will be sent to all employees and stakeholders. During the execution phase, weekly emails or meetings will be conducted to

monitor schedule and updated progress. Email or videos of detailed procedures and post-implementation stories will be sent to stakeholders if needed.

Training Plan

Planning manager will deploy a training program to help others be ready for future work.
Both in-person and virtual training programs will be expected for necessary departments. Mandatory training will be carried out for those who are changing positions, but the training content varies according to their personal professional ability and future work content, which can be simplified or increased according to their suitability to the positions.
Anyone that is experiencing difficulties adapting to new changes will be provided with both self-help groups and focus groups to allow them the opportunity to address their concerns and find solutions.

Procedures for expected problems can be given to engineers. From there each individual has their own skillset to really solve each problem in their own way, which will allow them to co-create the future of the company.

Sustainment Plan

It is important to reaffirm with all stakeholders and employees because organizational change is necessary and important. Project leaders will update project managers with how employees are faring after the transitional period. Project managers will have weekly meetings with change management to give updates on overall transition progress, pros and cons. Human resources will collect and analyze feedback through both in person communication and surveys. Team leaders will have continuous feedback communication with team members to identify barriers and implement corrective measures after deployment. Benefit realization will be tracked to measure effectiveness of transition. Transition success will be celebrated among employees. Actionable steps will be made toward improving transition to future state and working environment for team members. Open line of communication will be provided for any employee seeking to address concerns regarding their roles and overall management.

Rewards and recognition will be provided to affected teams and employees. Optional work from home will be allowed for members seeking different environments. Members may have the opportunity to request reimbursement for commuting travel expenses, upon proof of travel. Extra revenue will be allocated towards more company functions and food carters of choice.

__Project Change Controls__

Project Change Request :

Based on the three primary functions of the mobile application "Housing Comments", "Roommate Matching" and "Purchase/Sale of Goods", the team needed to develop and add a new function to the mobile application called "Commuter Transportation".

Function Details:

This mobile section provides a USC student carpool system that operates strictly within a network of registered students. Through the information platform with USC, we have access to valid and up-to-date student information. This means that passengers and drivers are verified USC students during carpooling. The security of personal data and information is guaranteed and reasonable fees or incentives are offered within the system.

Evaluate the Impact of Change:

For mobile applications, the addition of a new function means that a wider variety of customer demographics can be absorbed, which in a practical sense adds more potential traffic. The carpooling feature is definitely a good alternative to commuting for students who live far from the USC campus. And it can earn a certain amount of revenue for the company and the student drivers. This change, proposed by the Board of Directors, is a worthwhile goal to achieve as resources and manpower and other conditions permit.

Impact on

- ***WBS:*** Adding a new mobile application section will not have a great impact on the WBS section, because the general structure of the mobile application does not need to be changed, such as UI, system language, version, etc. At the same time, in order to save money, the team can choose to outsource the design to a similar established team, and this application can be carried out in parallel with other sections. Finally, the testing process needs to be critically reviewed.

- ***Schedule****:* By outsourcing to another team, you can avoid adding extra work time to the greatest extent possible. The design of this section will take about 50-60 days, but since this task is in the critical path, it will not affect the total duration. However, An additional 15 days are added to the ideation and planning section, which includes 3 days for Scope, 10 days for risk management, 20 days for budget estimation, and 15 days for

project plan documentation (Critical Path). An additional 8 days are expected to be spent in the testing phase, including 3 days of QA System Testing (Non-critical path), 5 days of prototype testing, and 3 days of Issue/Bug resolution. For development and marketing expect to need an additional 6 days in the Release Management and Planning section. In the end, it will take approximately 30 additional days to complete this change in the total construction duration.

- **_Budget:_** According to estimates, adding the new scope will probably increase the budget by about $75,000 or so. This includes some costs for the free equipment provided to student drivers.

- _Stakeholders :_ For some pre-existing stakeholders, adding this section will increase the number of new stakeholders. The drivers who earn a certain amount of money by using the software and the passengers who choose this commuting method are new stakeholders. And to some extent, it will reduce the number of parking spaces used inside the campus. This is good for the entire USC community and increases the cohesion of students.

- **_Risk:_** Now that the world is in a period of epidemic transmission, contact with different groups of people may lead to increased chances of epidemic infection for passengers as well as drivers. This type of travel greatly aids in the spread of the virus. To minimize the spread of epidemics, we can limit the number of carpoolers and recommend, but do not mandate, that both drivers and passengers wear masks throughout the ride.