



Prototype



"Explore with ease, your itinerary, your way"

Fall 2025 - CS411
Team Copper

Your Itinerary

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Team Biography



Jandra D. Arias Tavarez is a second degree seeking student at ODU working on her bachelor in Computer Science. She aspires to work as a Software Developer after graduating.

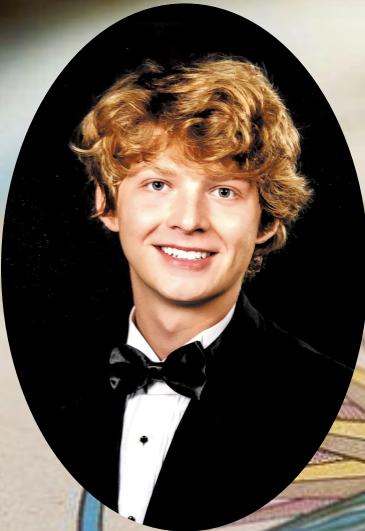


Stephen Usselman is a senior at ODU majoring in computer science. He is looking to pursue a career as a Software Developer after university.



William Mbandi is a senior at ODU majoring in computer science with a minor in cyber security. Wants to work as a Software Developer after he graduates.

Team Biography



William Poston is a senior at ODU majoring in computer science with a minor in data science. After school, he dreams of being an AI prompt engineer.



Crystal Rivas is a second degree seeking student in Computer Science at ODU with a background in math education. Her expertise in problem solving drives the transition and aims to develop innovative and impactful solutions.

Team Biography



Balemuul Ymamu is a senior at ODU majoring in Computer Science. He is eager to gain hands-on experience in tech field and look forward to working as a Software Developer after graduation.



Fredrick Terling is a senior at ODU majoring in Computer Science. He is currently hoping to get his foot in the door for most tech job opportunities but dreams of being a Game Developer and ultimately a Game Producer.

Team Biography



Jacob Cook is an ODU Computer Science alumnus, IT Instructor at the Southern Virginia Higher Education Center, and founder/CEO of Southside Tech Services. He has built a career spanning software development, general IT, and hands-on education, while also guiding students and businesses in adopting technology effectively. Jacob is passionate about mentoring, and he enjoys helping students bridge the gap between classroom learning and the real-world challenges of a career in technology.

Roles

Name	Role
Stephen Usselman	Software Developer and AI Expert
William Poston	Software Developer and Webmaster
Crystal Rivas	Software Developer and Database
Jandra D. Arias Tavarez	Software Developer and Database
Balemual Ymamu	Software Developer and Database
William Mbandi	Software Developer
Fred Terling	Software Developer
Jacob Cook	Mentor

Problem Statement

When travelers plan their own trips, all the time, effort, and stress- compounded further by the constraints of group travel- can sour the experience. While the time and effort can be cut down with travel agents and tour guides, they lack the personalized touch of planning for yourself and your needs. 76% of travelers turn to planning applications and websites to make the experience easier, but they only provide generic itineraries that lack personalization and flexibility [11]. These leave out the hidden gems that make a trip memorable and also adapt poorly to unforeseen complications. Travelers are left with having to choose between having an expensive or time-consuming planning stage, or they settle for a trip that is just not the experience they were hoping for.

Problem Characteristics



Choice Overload

- Consumers are given simply way too many options with no easy way to narrow them down.
- Even after you choose one option you find yourself having to make many more choices over the duration of your trip.

Generic Itinerary

- Whether planning it themselves or otherwise, individuals are lead to the most popular locations and attractions, not necessarily the ones the consumer would most prefer.
- Finding that great local spot or hole in the wall location can be a major highlight of any trip.

Rigid Plans

- An unexpected circumstance can throw all your carefully laid plans into disarray and leave you scrambling if you do not already have a backup.

Tour Guides

- Besides being expensive , tour guides lack the personalized touch often leaving travelers uninterested in the activities that were picked out.
- For introverts, tours can feel too overwhelming as it is usually a large group of people and it can be very difficult to accommodate any needs.

Group Frustrations

- Groups need a way to coordinate and share their plans to prevent conflicts and make suggestions.

Solution

Itiner-Ease is a mobile application designed to simplify and personalize itinerary planning for travelers, new residents, and spontaneous adventurers. Itiner-Ease allows users to generate custom itineraries based on their location and preferences. Users can filter activities, discover overlooked local treasures, and adjust plans in real time. Unlike existing solutions, Itiner-Ease combines personalized AI-driven user exploration with insights from verified local experts to create dynamic real-time itinerary suggestions for both individual and group travelers.

Personalized Itineraries



Personalization Profiles

- **Preferred Activities:** Whether you are a picky eater, looking for a more niche activity, or want to experience the local's favorites we take all these preferences into account when building your itinerary.
- **Customization Options:** Perhaps you want to eat a different kind of food each day or you have specific budgetary restraints you are trying to work under. We have options to modify the recommendations to account for these concerns.

AI-Driven Recommendations

- **Similarity Clustering:** Before our system can get a proper gauge on what exactly takes a place from simply good to one of your new favorites, we rely on users with similar reported interests to base Itiner-Ease's recommendations.
- **Learned Tastes:** As Itiner-Ease gets on your tastes, it gets even better at prioritising the options that you would enjoy the most.

Upgrade With Local Expertise



- **Local Guidance** - Users might be satisfied with just the recommendations our AI creates them, but nothing beats the knowledge of people who actually know the area.
 - Travelers pay a nominal fee to have their itinerary looked over and upgraded by our local experts. In addition some local experts may offer further tiers for personal tours, an emergency contact or other benefits.
- **Why Become a Local Expert?** - These Local Experts are an integral part of the Itiner-Ease ecosystem, so it is important that they are incentivized properly.
 - The local experts will make the majority of the fee, with Itiner-Ease taking a small cut. Itiner-Ease will also take advantage of these local expert recommendations to refine our AI recommendation algorithm.

Collaboration and Dynamic Updates

Group Profiles

- **Joint Itineraries:** Going on a family trip or even just a trip with friends? Itiner-Ease can use multiple user profiles to generate an itinerary, taking all your preferences, constraints, and a group voting system to develop a plan that works for all parties.
- **Plan Sharing:** Itiner-Ease can share all or only part of your itinerary to coordinate activities with others in the app or outside it.

Dynamic Itinerary Updates

- **Avoid Disruptions:** It is impossible to plan for everything but that does not mean we cannot minimize it where possible. Itiner-Ease takes a proactive approach to monitor local conditions and notify you of any concerns.
- **Hot Spots:** Relying on reviews means you might miss out on the exciting new location that just opened. If users with interests similar to you are rating it highly recently we may recommend an optional switch in your itinerary.

Explorer Rewards

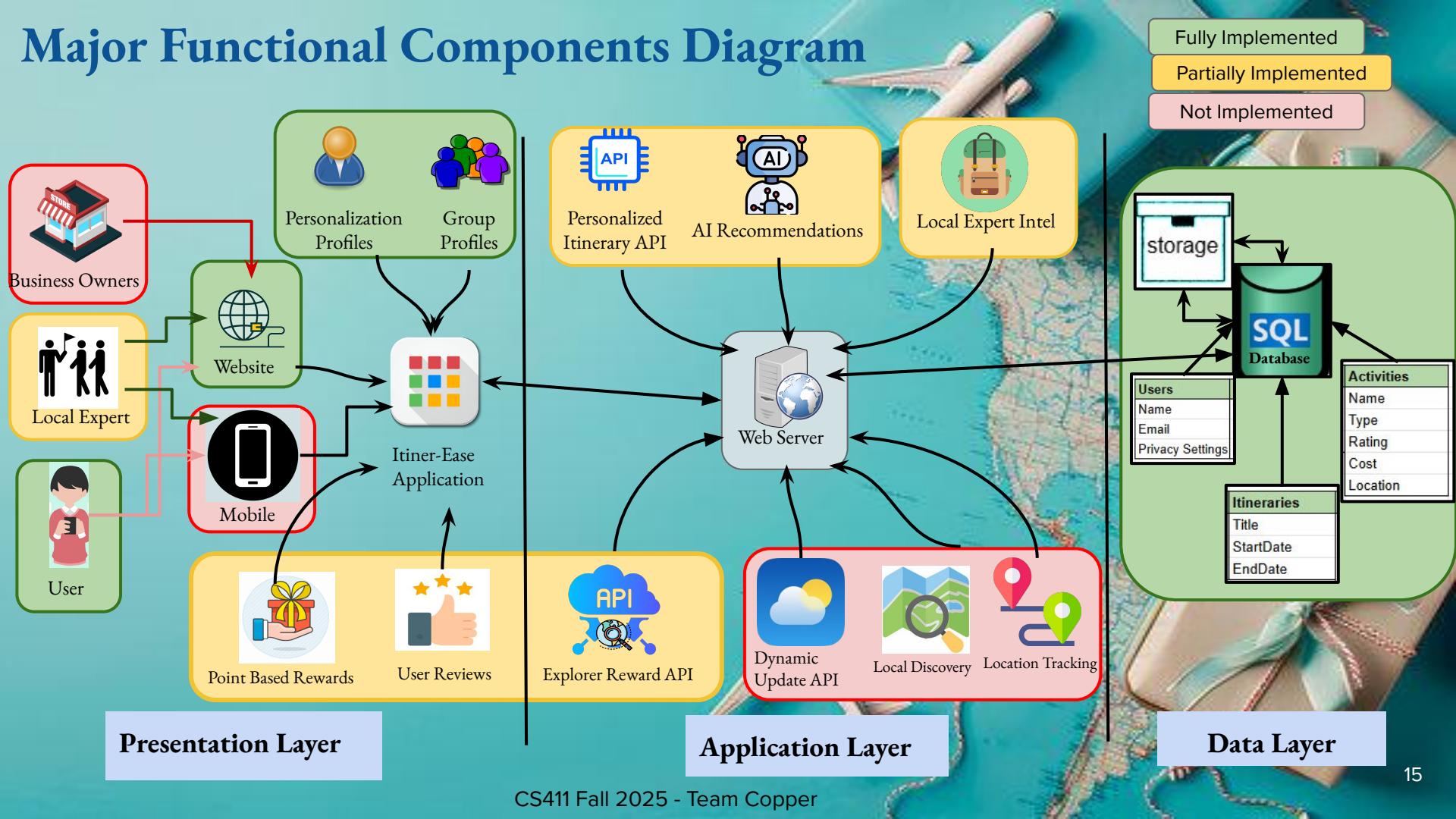
Local Discovery: Users can create positive reviews for their favorite locations and earn rewards if other travelers also end up enjoying the experience.

Sponsored Businesses: Itiner-Ease will partner with local businesses to increase their visibility in exchange for benefits to our rewards members.

Reward Benefits: Users can use their rewards to spend on our premium content such as discounts at participating locations, local expert guidance, and more.



Major Functional Components Diagram



Presentation Layer

Application Layer

Data Layer

Development Tools

Frontend Languages	HTML, CSS, JavaScript
Backend Languages	PHP
Integrated Development Environment (IDE)	Visual Studio Code
AI Development Tool	OpenAI
Version Control	Git through GitHub
Continuous Integration / Deployment (CI)	GitHub Actions and Workflows
Collaboration	Jira
Database	MySQL
Documentation	PHPDoc, JSDoc

Development Dependencies

UI Framework	Filament
Web Framework	Laravel
Testing Frameworks	PHPUnit
General Libraries	Laravelshift
Web Scraping API	Google Maps Extractor
Web Server Software	Nginx
Server Hosting	Laravelforge

User Roles

Role	Admin/Developer	Traveller	Local Expert	Business
Tasks	<ul style="list-style-type: none">• Resolve user issues• Keep app content up to date• Assist in local expert and business verification• Ensure user data privacy• Data analysis on app usage and trends	<ul style="list-style-type: none">• Create account as a traveller• Provide personal preferences and interests• Explore destinations and create itineraries• Read and leave reviews• Create group itineraries with other travellers	<ul style="list-style-type: none">• Create account as local expert• Provide verification of residence in area• Create itineraries based on customers' preferences• Lead travellers out on tours• Read reviews on destinations as well as themselves	<ul style="list-style-type: none">• Create account as local business• Provide proof of ownership for verification• Register and inform travellers of events• Advertise business• Read reviews on themselves

Feature Table

Feature Groups	Features	Real World Product	Initial Prototype	Initial Plans	Current Status
Account Management	Login/Authentication	Fully Implemented	Fully Implemented	Demo 1	Completed
	Account Creation/Deletion	Fully Implemented	Fully Implemented	Demo 1	Completed
	Account Management	Fully Implemented	Partially Implemented	Demo 1-2	Completed
	Notifications	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Payment Information	Fully Implemented	Eliminated	Post Prototype	Post Prototype
Itinerary Creation	Personalized Profiles	Fully Implemented	Fully Implemented	Demo 1-2	Completed
	AI Recommendations	Fully Implemented	Partially Implemented	Demo 1-2	Completed
	Business/Location Reviews	Fully Implemented	Partially Implemented	Demo 2-3	In Progress
	Itinerary Customization	Fully Implemented	Partially Implemented	Demo 2-3	In Progress
Public/Group Profiles	Joint Itineraries	Fully Implemented	Fully Implemented	Demo 3	In Progress
	Plan Sharing	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Choice Voting and Selection	Fully Implemented	Eliminated	Post Prototype	Post Prototype
Dynamic Itinerary Support	Weather Updates	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Local Event Tracking	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Dynamic "Hot Spot" Advocacy	Fully Implemented	Eliminated	Post Prototype	Post Prototype

Feature Table Continued

Feature Groups	Features	Real World Product	Initial Prototype	Initial Plans	Current Status
Explorer Rewards	Discounts and Coupons	Fully Implemented	Fully Implemented	Demo 3	To Do
	Review Goals	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	User Ratings	Fully Implemented	Eliminated	Post Prototype	Post Prototype
Data Analytics and Reports	AI Preference Learned Behavior	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Profitability Metrics	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Income Summary	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Popularity Trend Visualization	Fully Implemented	Eliminated	Post Prototype	Post Prototype
System and Data	Review Moderation Tools	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Algorithm Updates	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Health and Security Monitoring	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Full Database Access	Fully Implemented	Fully Implemented	Demo 1	Completed
	Local Expert Selection	Fully Implemented	Fully Implemented	Demo 3	To Do
Local Expert	Local Expert/User Correspondence	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Local Expert Reviews	Fully Implemented	Eliminated	Post Prototype	Post Prototype
	Character Reviews	Fully Implemented	Eliminated	Post Prototype	Post Prototype

Stories to Features: Account and Services

Currently Implemented
Planned Implementation
RWP Implementation

Feature Group	Feature	User Story
Account and Services	Login Authentication	As a traveler or local expert, I would like my account to have security measures to prevent unauthorized access.
	Account Creation/Deletion	As a traveler or local expert, I would like an account to store my information
		As a traveler or local expert, I would like to be able to delete my account if I no longer have need of it.
	Account Management	As a traveler, I would like to be able to go back and change my preferences after account creation.
		As a local expert, I would like a way verify my expertise so that potential travelers know the quality of my advice.
		As a local expert, I would like a way to be able to update my specialities after account creation and expert verification.
		As a local expert, I would like a way to manage my availability so people only request my services when I am available.
Notifications		As a local expert, I would like to be notified when a user has requested my advice so I can get back to them.
		As a traveler, I would like to be notified if there had been any changes made or recommended for my itinerary.
	Payment Information	As a user, I would like a way to securely book and pay for services through the platform.

Itinerary Creation

Currently Implemented
Planned Implementation
RWP Implementation

Feature Group	Feature	User Story
Itinerary Creation	Personalized Profiles	As a local expert, I want to know if a group needs special provisions for children or other members.
		As a traveler, I want to record my preferences so that I am recommended things that I want to do or see.
		As a traveler, I want to be able to indicate activities that I do not wish to do or want to avoid.
		As a traveler, I want to indicate any allergens, sensitivities, or intolerances that I have.
		As a local expert, I want to be able to view my traveler's preferences so that I may make specific recommendations.
	AI Recommendations	As a traveler, I want to be able to rate and give feedback on recommendations so the AI can improve its recommendations
		As a traveler, I want to receive AI-generated activity suggestions based on my previous trips
		As a traveler, I want to only be offered activities and locations that actually exist and not "AI hallucinations"
		As a traveler, I want to set budgets that will be taken into account with my recommendations.
		As a local expert, I would like to see the recommendations the AI made for the traveler I'm assisting.
	Business Location Reviews	As a traveler, I want to leave reviews on places I have been to help other users.
		As a traveler, I want to be able to anonymously review locations.
		As a traveler, I want to be able to include pictures in my reviews to give better context.
		As a traveler, I want to be able to read reviews from other travelers and locals.
		As a business owner, I want to read reviews to see what people like and what I can improve on.
	Itinerary Customization	As a traveler, I want to be able to input preferences for users who do not have an account.
		As a traveler, I want to have trip specific preferences without having to override my existing preferences.
		As a traveler, I want to search for businesses that participate in the rewards program so that I can maximize my points.
		As a traveler and local expert, I would like tools to add, remove, and move around activities on the generated itinerary.

Group Profiles and Local Experts

Currently Implemented
Planned Implementation
RWP Implementation

Feature Group	Feature	User Story
Group Profiles	Joint Itineraries	As a traveler, I want to have my activity recommendations be based on all groupmates preferences. As a local expert, I want to know the size of a group before I recommend them anything.
	Plan Sharing	As a traveler, I want to be able to share my itinerary and view others. As a traveler, I want to invite others to my itinerary or trip.
	Choice Voting	As a traveler, I want to have a way for my group members to vote on activities.
Local Experts	Expert Selection	As a local expert, I want to display my specialties so that I can be matched with travelers who need my expertise. As a traveler, I want to access a list of local experts, so that I can choose someone who best matches my needs.
	Two-Way Correspondence	As a local expert, I want to be able to suggest real-time changes to a traveler's itinerary when I see opportunities. As a traveler, I want to be able to communicate with my local expert if I have any questions about their recommendations.
	Expert Reviews	As a local expert, I want to be able to leave reviews explaining my choices and changes to an itinerary. As a traveler, I would like an easy to reach location to view the expert reviews that I have paid for.
	Character Reviews	As a traveler, I would like a way to review local experts directly to rate the advice that they offer. As a local expert, I would like to access my reviews and ratings to see how I can improve my services.

Dynamic Updating and Explorer Rewards

Currently Implemented
Planned Implementation
RWP Implementation

Feature Group	Feature	User Story
Dynamic Updating	Weather Updates	As a traveler, I want to be notified in advance when weather conditions would disrupt my plans.
	Congestion Tracking	As a traveler, I want my itinerary to offer alternatives if a location or activity is going to be overcrowded.
		As a business owner, I would like to see levels of congestion in the area around my business.
	"Hot Spot" Advocating	As a traveler, I would like my itinerary to update if a better option becomes available before my trip.
Explorer Rewards	Discounts and Coupons	As a business owner, I want to offer group packages to larger group sizes.
		As a traveler, I want to a way to be rewarded for being an Itiner-Ease customer.
		As a traveler, I want to view my reward point balance so that I can track my progress toward rewards.
		As a business owner, I want to offer special promotions or bonus points so that I can incentivize repeat visits.
	Business Interface	As a business owner, I want to manage my business rewards profile on the platform
		As a business owner, I would like to claim a business if it is mine and verification process to ensure it is not falsely claimed
	Review Goals	As a traveler, I want to be rewarded for taking the time to leave reviews and improve Itiner-Ease

Data Analytics, Reports, System, and Data:

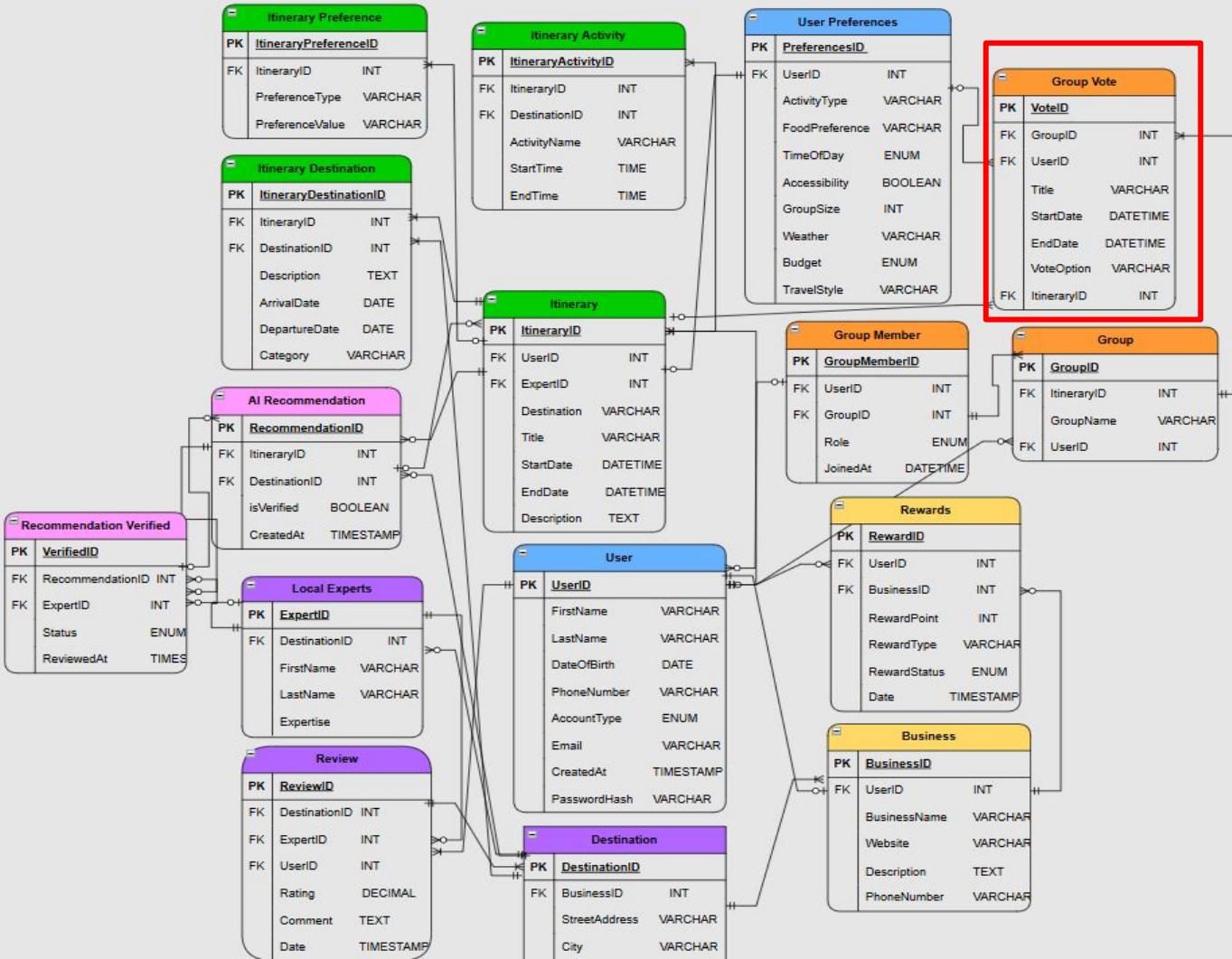
Currently Implemented
Planned Implementation
RWP Implementation

Feature Group	Feature	User Story
Data Analytics and Reports	Learned Preference Behavior	As a business owner, I want to focus on advertising my business to users who are interested in it already.
	Profitability Metrics	As a business owner, I want to see analytics on customer engagement through the reward program.
	Local Expert Interface	As a local expert, I would like a way to view and analyze my earnings from giving local expert upgrades.
		As a local expert, I would a way to view how often travelers view my profile versus choose my services.
	Popularity Trends	As a business owner, I want to see the preferences of travelers who visit nearby so I can tailor my offerings.
		As a local expert, I want to track trending reviews to find new places.
System and Data	Health/Security Monitoring	As an administrator, I would like a way to monitor when Itiner-Ease data is being accessed.
		As an administrator, I would like a way to monitor the uptime of various Itiner-Ease services.
	Full Database Access	As an administrator, I would like a way to access entries in the database directly so that I can manage them properly.

User Stories to Tasks

	Feature	User Story	Task
Currently Implemented	Login Authentication	As a traveler or local expert, I would like my account to have security measures to prevent unauthorized access	<ul style="list-style-type: none"> • Login/Authentication Service
	Account Creation	As a traveler or local expert, I would like an account to store my information	<ul style="list-style-type: none"> • Account Creation Service • Account Management Service
	Personalized Profiles	As a traveler, I want to record my preferences so that I am recommended things that I want to do or see.	<ul style="list-style-type: none"> • Personalized Profile Creation Service • Personalized Profile Interface
	Business Location Reviews	As a traveler, I want to be able to read reviews from other travelers and locals.	<ul style="list-style-type: none"> • Review Interface
	Itinerary Creation	As a traveler, I want to view all the activities and locations I will visit in one package	<ul style="list-style-type: none"> • Itinerary Creation Interface
	Itinerary Customization	As a traveler, I want to be able to input preferences for users who do not have an account	<ul style="list-style-type: none"> • Itinerary Management Interface
	Joint Itineraries	As a traveler, I want to have my activity recommendations be based on all groupmates preferences.	<ul style="list-style-type: none"> • Group Itinerary Feature
	Expert Selection	As a traveler, I want to access a list of local experts, so that I can choose someone who best matches my needs.	<ul style="list-style-type: none"> • Local Expert Itinerary Feature
	Full Database Access	As an administrator, I would like a way to access entries in the database directly so that I can manage them properly.	<ul style="list-style-type: none"> • Admin Panel with Database Access

Database Schema



Database Schema



Phase 1 : Demo 1

Sprint 1 (Week 1-2)

Initialize project tools

- Create git repository
- Setup Jira board
- Decide on tech stack and framework for frontend and backend

Sprint 2 (Week 2-3)

- Setup development environment
- Deploy initial server on DigitalOcean

Create initial UI mockups

- Build Filament blueprint
- Frontend login forms

Sprint 3(Week 3-5)

Implement core user functionality

- Registration flow (frontend + backend logic)
- Profile update & delete

Manage user preferences

- Store preferences in database
- Update schema, migrations, and seeders

Phase 2 : Demo 2

Sprint 4 (Week 5-7)

Continue development of core features

Account Setup

- Allow user to select type(traveler, local expert, business)
- Expand preferences for user to select (database seeder)

Itinerary Creation

- Basic Itinerary (create, add time, date, location)
- Added location data (database seeder)

Sprint 5 (Week 7-8)

Interface updates

- For profile preferences
 - Improved visual style: app buttons and layout
- Added team bio section in main page
- Added Itiner-Ease Logo

Reviews Data

- Acquire review data (web scraping)
- Added review data into database

Initial AI implementation

Sprint 6 (Week 8-10)

Location and review tagging

- Tag locations associated with reviews

Development Changes

- Switch deployment to Laravel Forge

Itinerary Customization

- Option to select preferences or saved preference profiles
- Itinerary Viewer

Phase 3 : Demo 3

Sprint 7 (Week 10-12)

Continue Itinerary Customization

- Refine UX for editing, updating, itineraries

Joint Itineraries

- Enable users to create and manage shared itineraries
- Allow collaboration from multiple users

Explorer Rewards

- Introduce discount and coupon options from businesses

Local Expert

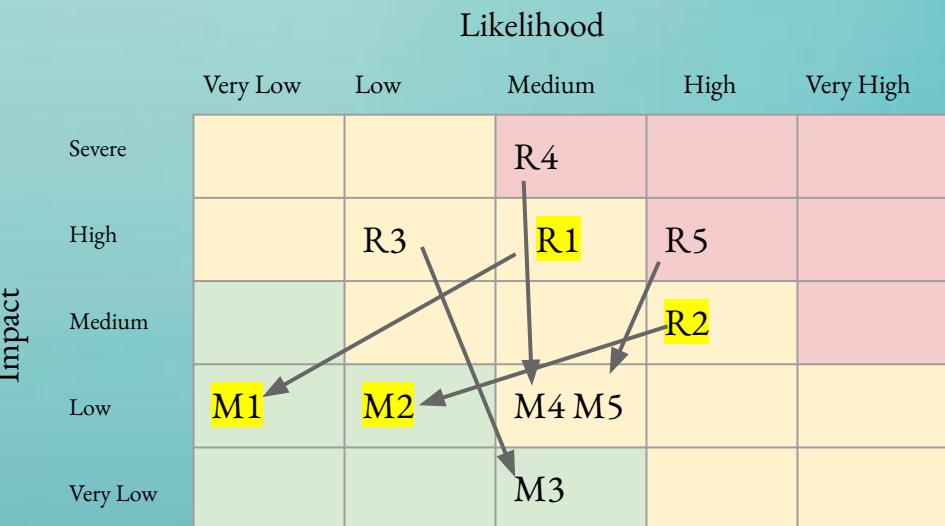
- Add ability to select a local expert

Sprint 8 (Week 12-14)

- Prepare for Demo 3 Presentation

- Final deployment
- Clean up codebase and documentation
- Polish user interface and experience

User Risk Matrix



Risks

Prototype Risks

R-1: User finds the app overwhelming or confusing to use.

R-2: User receives recommendations that don't match preferences.

R-3: User is in an area with poor internet connectivity.

R-4: Users abandon the app due to lack of engagement.

R-5: Users won't trust strangers to give advice and personalized tours.

Mitigation

M-1: Ensure an intuitive UI/UX with guided onboarding and simple navigation.

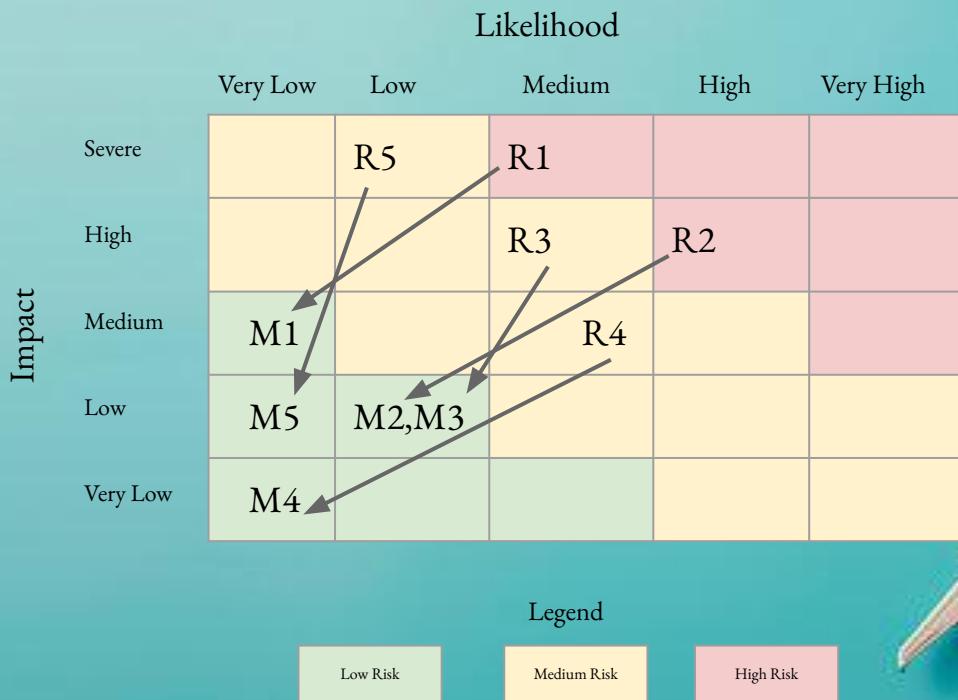
M-2: Allow users to personalize preferences and provide feedback to improve recommendations and we will work on AI optimization.

M-3: Implement offline mode with cached recommendations and maps.

M-4: Implement push notifications, gamification, or incentives like discounts to keep users engaged. Integrate these features with our premium services and our commercial partners to reward users and drive revenue.

M-5: Provide local expert verification and reviews similar to Uber/Lyft.

Customer Risk Matrix



Risks

R-1: Investors see the app as too niche or risky to fund.

R-2: Businesses/advertisers don't see value in paying for promotion.

R-3: Businesses feel underrepresented or struggle to get visibility on the platform.

R-4: Advertisers worry about ad placements being ineffective or intrusive.

R-5: Local experts try to refund products to cut out Itiner-Ease.

Mitigation

M-1: Present clear market research, growth potential, and revenue streams (ads, partnerships, premium features).

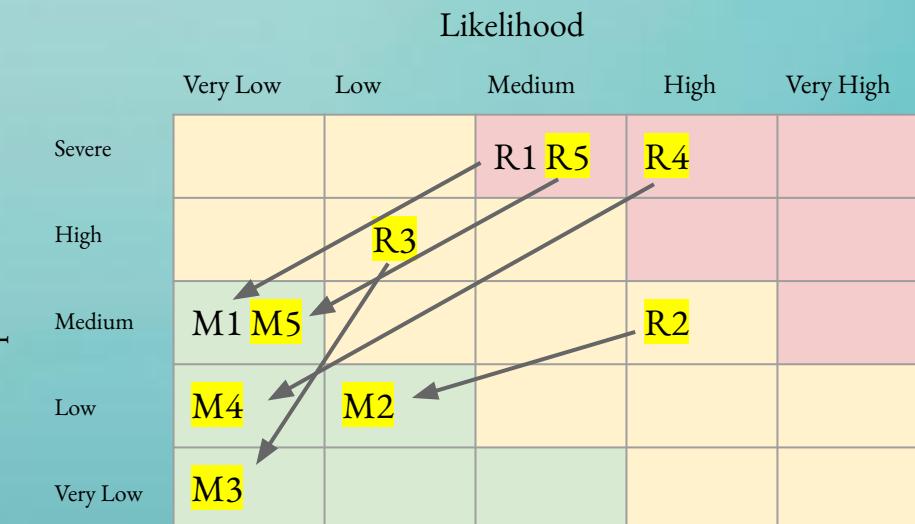
M-2: Offer analytics on user engagement, conversion rates, and ad performance to prove return on investment.

M-3: Provide affordable listing options, featured spots, and local partnerships.

M-4: Use non-intrusive native ads and give businesses targeting options to reach the right audience.

M-5: Strict refund policy preventing unpaid use of itineraries.

Technical Risk Matrix



Risks

R-1: Not enough local support to find obscure locations.

R-2: Application software issues.

R-3: User declines to share location/GPS services.

R-4: Security breach or data leak.

R-5: AI hallucinations and made up data.

Mitigation

M-1: Integrate with existing services like Google Maps, employ web scraping, hire/incentivize local experts to gather data on obscure locations. Offer deals with local businesses.

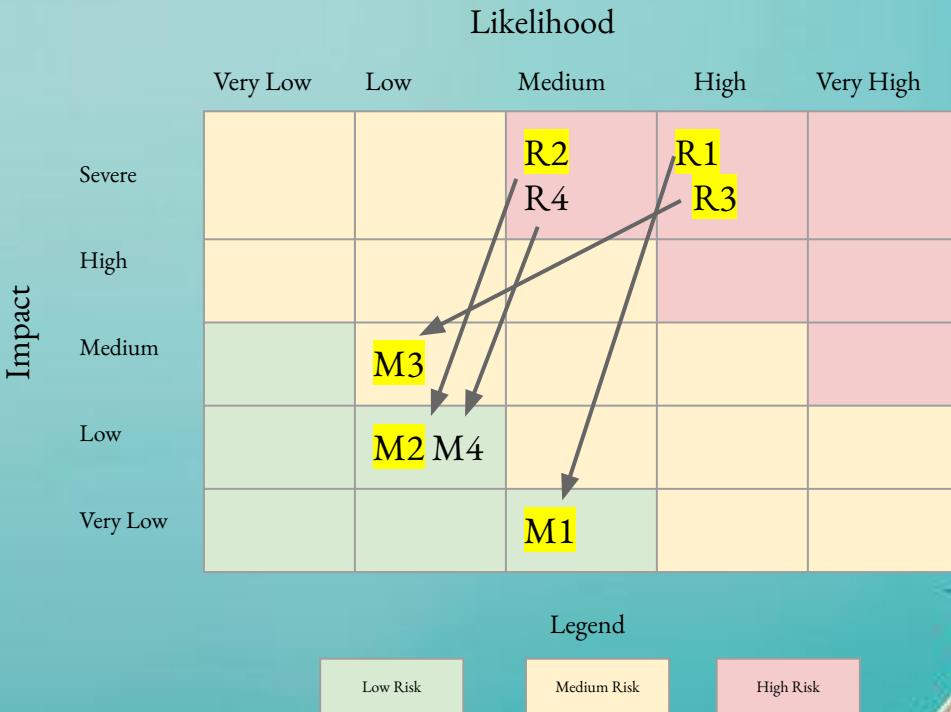
M-2: Prioritize application performance.

M-3: Allow users to search by city/zip code.

M-4: Practice cybersecurity hygiene.

M-5: Focus on specific pulled data set and expand as we continue to refine.

Legal & Security Risk Matrix



Risks

R-1: Unauthorized sharing of sensitive user data, including age, location, and preferences.

R-2: Potential legal issues arising from differences in religious beliefs, customs, and local laws.

R-3: Health risks related to pre-existing medical conditions, such as allergies or injuries from recommended activities.

R-4: Users' events get cancelled after they already paid for a local expert.

Mitigation

M-1: Itiner-Ease will collect only the necessary data with explicit user consent.

M-2: Users will be encouraged to research local laws, while the app will provide relevant legal and cultural information.

M-3: Itiner-Ease will not be liable for any health concerns. Itiner-ease will make publicly available allergen information available to the user, but it is up to the user to verify this information themselves.

M-4: Intiner-Ease will only provide refunds for any cancellations with a minimum of 48 hours notice.

Learning Progress

- Learning a new programming language PHP
- Learning about the Laravel Breeze framework
- Learning about the database management (mysql, migrations, seeders)
- Learning about deploying to the Digital Ocean Droplet
- Learning how to implement openAI's library
-



Repository Setup Status

During Sprint 1, the team already established a Jira board and a GitHub repository. Source code management, issue tracking, and development collaboration are all done through the repository. A solid basis for iterative development has been formed through the establishment of first commits, branching strategy, and code standards.

Github Repository: <https://github.com/jandraarias/f25-Copper>

Team Website: <https://willpatpost.github.io/Itiner-Ease/>

Prototype Status

Admin Dashboard:

<https://itiner-ease.on-forge.com/admin>

Create/Login: <https://itiner-ease.on-forge.com/>

Ambitious Goal Follow-Up

Update for demo 3



Technical Issues/Concerns/Challenges

- Update for demo 3
 - had a just-barely functional prototype from demo 2
 - didn't have enough personalization
 - needed to make the processes more transparent
 - refining the application prototype

Prototype Presentation

Q&A

**“Guided by Locals.
Designed for Explorers.”**

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