SW Engineering CSC648/848

Project Name: globetrottr

Section Number: 01

Team Number: 03

| Name: | Role: |
| --- | --- |
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Milestone 1

Date: 2/20/2023

History Table (Revisions)

### 1. Executive Summary

There are many places in the world. Many people have it as their life goal to travel to these places, to experience new cultures, forge new connections, and make memories that last a lifetime. However, many don’t have the time to plan out a trip, or they are on a tight budget and are unsure of whether they can afford to travel. And even with enough time and money on one’s hands, it is often a chore to figure out how to maximize one’s experience, from which landmarks to see to which restaurants one should go to. The existing solutions either overwhelm users with too much information, or they don’t plan out the full trip (only individual parts). That is why we created globetrottr: traveling is one big algorithm, with many variables such as transportation, places to go to, duration of stay, budget, etc. Computers are great at executing algorithms, which leads to the question, why don’t we use them to come up with our schedule? Our users can spend less time on the minute details of their trip, and more time on having the best experience possible. Seeing the world should be a privilege that anyone can enjoy, without any hassle!

Our application will be extremely simple to use. Users will simply input where in the world that they would like to go, and input values such as what their budget is, how long they will be staying, preferences such as types of restaurants, hotel ratings, etc. Then, the app will use information from APIs to come up with a variety of schedules (each given a final rating based on the user’s inputs) that encompass their entire trip, from start to finish. These schedules will cover aspects such as what flight the user will take, what hotel they will stay at, what landmarks they will see at a given time, what time they will need to be at a given train/bus station, etc. All of the work of planning out the trip will be abstracted away, and users simply will need to choose a schedule that fits their needs the most, and pay for the associated hotel bookings, plane seats, etc. Our app is unique in this way, as we will provide the entire experience from start to finish, with no need to know what places you want to go to. Other apps assume you know where you want to go, and provide minimal suggestions on their end.

Our team is composed of university students who want to use their skills in computer science to make people’s lives better. We recognize that time is one of the most valuable currencies in today’s world, and our app will save people a lot of time and stress when it comes to planning their trips. As a small startup, we welcome user feedback as it allows our application to grow in its capabilities. We use the Agile methodology to quickly iterate and produce working prototypes that allow us to continuously add new features. Furthermore, we are very interested in learning new technologies and ideas; this drive to become better software engineers means our product can only get better in the future.

### 2. Personas and User Stories

**Devino Kernos**

Fifty-nine-year-old Devino Kernos is the father of 10 children and the grandfather of 23. He lives in Kefalonia, Greece with his thirty-two-year-old wife, Kevina Liunos. Devino loves playing his classical guitar that he picked up somewhere along his travels in Spain many years back. He sometimes likes to play for an audience whenever there is some sort of festival going on in Kefalonia.

Every morning, Devino walks to the beach and relaxes under some shade while sipping Greek mountain tea and has some eggs and pita bread drizzled with olive oil and topped with oregano. For lunch, his go-to is a traditional Greek salad consisting of cucumbers, feta cheese, olives, tomatoes, all drizzled with olive oil and with a side of tzatziki sauce. His dinner is always had with his sweet, dear, beloved Kevina, where they usually eat gyros topped with tzatziki and olive oil, stuffed in pita bread.

Devino is an upper-class gentleman who is the CEO of a very large olive oil producing company in Greece that ships all over the entire world. The thing about Devino is that he loves to travel. He’s traveled to Spain, Egypt, France, Belgium, you name it, since he was a young man. The only issue is that he is quite old fashioned and isn’t very good with technology. These days, travel guides are a lot more useful than just calling up a place you want to travel to as that would require a lot of phone calls. Unfortunately, a lot of these travel guide apps these days are just so hard to use for Devino. It’s unclear to him how to use them and there is just way too much information on a single page for him to even begin to navigate the app. Devino wants an instruction guide and less clutter on the app screen to be able to easily use a travel guide app to travel to more places in an easier and more efficient manner.

**Justine Wong**

Twenty-five-year-old Justine Wong is a newlywed. She lives in San Francisco, California with her (also newlywed) twenty-eight-year-old husband, Esau Husarez. Justine is a dog mom of two golden retrievers and a yorkie and she absolutely loves drawing. She’s drawn multiple portraits of her dogs, her husband Esau, relatives, the Golden Gate Bridge, you name it. She is so good at drawing, in fact, that she has had some of her work displayed in the San Francisco Museum of Modern Art.

Every morning, Justine takes the dogs for a walk around the city with her hubby, Esau. They frequent Peet’s Coffee where Justine usually orders a Golden Chai Latte with oatmeal, and Esau orders a Golden Cold Brew Oat Latte with a Chicken Chorizo Flatbread sandwich. For lunch, they typically frequent In-N-Out where they both have the same exact order of two Double-Doubles, a side of animal fries, and a strawberry milkshake. Dinner is always homemade with the couple eating a Chinese-Mexican fusion meal.

Justine is an upper-middle class woman who works as a part-time employee at a local boba shop. Her lovely, handsome husband, Esau is a software engineer at a very large FAANG company, so Justine is only working out of boredom. Esau’s company allows him a lot of vacation time, so he and Justine love traveling together in these periods. Since they are both newlyweds, they’d like to take a honeymoon vacation using a travel guide app. The issue is that they had a horrific experience using one of them. The one they used failed to inform them that a hotel they wanted to stay at had a no-pet policy. They unfortunately did not know this and brought their pets only to find out that the hotel could not accept their three dogs. What a disastrous day that was. A lot of travel guides don’t make mention of certain policies that locations have regarding pets and other such things. And while it is true that they can check these policies on the hotel’s websites, the point of travel guides is to make such things available on those travel guides for convenience’ sake! So, Justine wants a way to know certain policies that may apply to most people (such as no-pet policies) before traveling and booking into a hotel so that using a travel guide won’t result in stress and dissatisfaction with a trip, as the point of trips is to have fun.

**Brandy Al-Khoury**

Thirty-two-year-old Brandy Al-Khoury is the mother of a baby girl. She lives in Dearborn, Michigan with her husband of six years, Jayed Al-Guptari. Brandy is obsessed with classical architecture. She loves learning about historical buildings such as the Empire State Building in NYC, towers such as the Big Ben in England and the Leaning Tower of Pisa in Italy, and even churches such as the Westminster Abbey in England and the Sistine Chapel in the Vatican.

Every morning, Brandy and her beloved husband Jayed eat breakfast together, with breakfast usually consisting of eggs, pita bread, olives, and za’atar. Lunch is usually skipped as they head to the gym three hours after breakfast and workout hard for a solid two hours doing free weights and cardio. For dinner, Brandy makes anything she has the ingredients for, but usually makes shawarma or falafel wrapped in pita or lavash bread since those are Jayed’s favorite meals.

Brandy is a lower-middle class woman who photographs professionally and has personal photography projects. Jayed is a construction manager who doesn’t have too many hours of vacation time, so when the couple do go on vacation, they make the most of it. Unfortunately, travel guide apps don’t always allow them to make the most of it. One time, they had used a travel guide app to take a trip to London in order for them to explore the city, but primarily for Brandy to work on a personal photography project which was to take pictures of, you guessed it, classical architecture, specifically of the Westminster Abbey. She’s always wanted to photograph the inside of it for years. Woefully, no one is allowed to photograph the inside of the abbey. The guide did not mention this. Brandy’s mood was soured and her whole trip had been ruined to a large degree as she couldn't fulfill her goal. They are not very financially well off so the trip was a waste of money and Jayed barely has vacation hours, so this was most certainly a waste of vacation hours. Now one could make the argument that she should have done research prior to taking on this endeavor, however, the point of a travel guide is to guide one and inform one of the dos and don’ts of a particular place. There are many travel guides that don’t inform people of things such as policies forbidding people from taking photos. Hence, Brandy wants more robust information on a location including the dos and don'ts of a particular spot so that using a travel guide won’t result in stress, lost money, and lost time.

**USER STORIES**

Format:

(ID). User Story

1. Priority
2. **Devino** *wants an instruction guide and less clutter on the app screen* so that he can easily navigate the app.
   1. High priority
3. **Brandy** *wants to get detailed schedules from inputting variables such as duration of stay and budget*, so that she can save time and money.
   1. High priority
4. **Justine** *wants a way to know certain policies that may apply prior to traveling and booking into a hotel* so that there will not be surprise unknowns when on the trip.
   1. Low priority
5. **Brandy** *wants more robust information on a location including the dos and don’ts of a particular spot* so that she can respect cultural differences and maximize her experience.
   1. Low priority
6. **As a person who can’t speak/read English too well**, *I want suggestions and results to pop up as I type in a location that I’m searching for* so that my limited English doesn’t prevent me from using the app.
   1. Low priority
7. **As an elderly person**, *I want a search history to be able to type less, find what I need much quicker, and find where I left off last time I used the app* since I type very slow because of my age.
   1. Medium priority
8. **As a disabled user**, *I want text-to-speech capabilities* so that I can understand what is on the screen.
   1. Low priority
9. **Brandy** *wants to dynamically edit the schedule (such as switching out midpoints) to get new schedules based on that edit*, such that changes of plans don’t affect her experience.
   1. Medium priority
10. **Devino** *wants to sort schedules by factors such as total cost, average restaurant quality, and overall score*, so that he can save time and pick the schedules that fit his needs the most.
    1. Medium priority

Organizing User Stories into a Similar Activity:

1. Making Search Easier:
   1. 5
   2. 6
2. Information on a Trip:
   1. 3
   2. 4
3. Accessibility:
   1. 1
   2. 7
4. Finding the right Schedule:
   1. 2
   2. 8
   3. 9

### 3. Data Definitions:

**Query**

A query is a form we let the user fill in and will be used to produce the output (schedules). Potential data fields of a query include: destination, budget range, party size, expected duration of trip (how many days and nights), a series of selected hashtags that would describe the trip, desired midpoints (if any) etc.

**Schedule**

A schedule is the app’s main output. It contains all the midpoints to be visited, routes connecting all midpoints, time and dates when the midpoints are planned to be visited, expected budget, total duration, a state (planned / active / past), an overall rating (how recommended is the schedule). Active schedules can be modified at any point.

**Midpoint**

A midpoint is a place where the user would stay. This does not include stations as they’d be a part of routes connecting midpoints. It can be described with the following attributes: type (i.e. hotel / restaurant / point of interest / shops…), rating (from 1 star to 5 stars), open hours (if available), a collection of hashtags, contacts (phone number, websites etc), a brief list of dos and don’ts (extracted from the associated article if available), and an associated FAQ section.

**Hashtag**

A single word that describes the midpoint. Hashtags will be used to facilitate faster search for midpoints, to better recommend midpoints to users, or to let users filter midpoints. For the simplicity of this project, a fixed preset of hashtags will be used across the entire project. Users won’t be able to input custom hashtags. Some example hashtag can be: #pet-friendly, #relaxing, #historical…

**Route**

A route is what connects two midpoints. This could include the means of traveling between the midpoints, such as airplane / ship / train / light rail / metro / bus / car or taxi ride etc. Routes can be acquired from Google Maps API. Additional information may be appended to routes based on the way of traveling. For example, fare information would be added to those with travel requiring tickets; travel distance and projected toll fares would be added to car rides.

**Party**

A collection of users that would go over the same schedule. Can be described with size (number of users) and an array of users.

**User**

Any individual that could be planning or participating in a schedule, or simply registered to our app. Can be described with a persona, their displayed username, user ID, password, user type (guest or registered), and schedule history.

**Persona**

A persona is a detailed description of a user other than their username and password. This could include their gender, age, favorite hashtags etc.

**Schedule Collection**

A collection of schedules that the user plans to go on; schedules can be added to this collection, which the user can view anytime they like.

**Schedule History**

A history of all of the schedules that a user has been on. Will be displayed in the user’s history section.

### 4. Initial List of Functional Requirements

Format:

(Requirement ID) Title of the Requirement:

* description
* priority
* user story to be referenced

1. Schedule Variables:
   1. Users will be able to input values for variables such as budget, duration of stay, preference for hotel and restaurant quality, etc and receive several schedules that fit or closely match their preferences.
   2. High
   3. 2
2. Detailed Instructions:
   1. Detailed instructions on how to use the application, as well as tips and helpful tooltips will be provided throughout the application workflow.
   2. High
   3. 1
3. Important Information for each Schedule:
   1. Each schedule will detail the total estimated cost, important notes for each part of that specific schedule (for instance, a no-pet policy or no smoking policy in a hotel/restaurant).
   2. Medium
   3. 3
4. Dynamic Midpoint Switching:
   1. users will be allowed to swap out midpoints dynamically, and the application will recalculate potential schedules for the remainder of the trip.
   2. Low
   3. 8
5. Schedule Search and Sort Functionality:
   1. A user will be able to search through schedules went on by other users in a given region; furthermore, in these search results, as well as results given from generated schedules, users can sort by overall schedule score, total cost, average restaurant rating, etc.
   2. Medium
   3. 9

### 5. List of Non-Functional Requirements

* Development:
  + Data:
    - Data should be stored in the database server on the team’s virtual machine.
    - The chosen database for this project is MongoDB.
  + GitHub:
    - Master branch should be the latest stable version of the project.
    - Branches should be merged from child branches to parent branches, with the master branch being the root branch.
    - Code passes tests upon upload and is tested before each upload to ensure that it is stable.
* Compatibility:
  + The site should function in all chromium and firefox based browsers.
  + The site should be cross-platform compatible.
* Accessibility:
  + Visually Impaired Users:
    - The site will support text to speech and navigation via speech.
    - The HTML in the page should be labeled with meaningful names and descriptions. It should also have meaningful alt-text tags on the non-decorative elements of the pages.
  + Languages:
    - The site should be served in the user’s preferred language.
    - Requirements listed in the visual impairments section should be supported in all languages.
* Maintenance:
  + The site should be easily maintainable; new features should be easily added and bugs should be handled without much downtime.
  + Limit the number of external 3rd party API calls, to reduce latency and ensure that development costs are low.
* Server performance:
  + Host 600 concurrent users at most.
  + Connections will only be established in approved locations.
  + The site should load in under 5 seconds and the server should respond to requests in under 500 ms under normal conditions.
* Security:
  + User data and connections should be encrypted and the encryption functionality should not add more than 1 second to any single function call.
  + Logs of user activity will be anonymized.
  + A secure (encrypted) connection with the client should be established.
  + Making a search query will require the user to pass a captcha test. Passing this test will clear the user to use the site for 24 hours before another captcha test is required.
  + Privacy:
    - Stored user information will conform to the law in the user’s location.
    - The user’s privacy will be respected.
    - Team 3 will not sell the user’s data.
* Safety:
  + The site will change recommendations depending on the age of the user.
  + The site will not recommend the user to enter places with conflict.

### 6. Competitive Analysis

Features: UX and design, Recommendations based on location, Knowledge of policy in advance

| Booking | Wanderlog | Yelp | Our Website |
| --- | --- | --- | --- |
| * Allows the user to book their hotels/flights on the website * Recommends locations to see the main attractions * Allows for members to put up airbnb locations for others to stay at * Displays whether there are deals for the location in place * Allows the user to check off what they are looking for in a hotel/flight | * Allows the creation of guides from the community * Provides the user the ability to plan their trip in advance * Gives recommendations to users on where to visit * Allows the creation of guides from guests without signing up first * Allows the optimization of a user planned trip | * Shows ratings of locations from other users * Shows estimated price through the use of dollar signs * Gives user-taken photos of the place * Provides a large variety of places depending on the needs of the user * Caters towards business owners and their establishments | * Cater towards the less tech-savvy user base, very simple to navigate * Displays a variety of planned out schedules based on user search * Hotel & restaurant policies presented in each schedule * Negates the need for importation of flight/hotel reservations * Users can readjust travel schedule mid-trip; application will automatically calculate new schedules |

Summary: What our website will feature is an easier interface to interact with in comparison to the alternatives. We are going to cater towards the needs of users that do not have as much experience with technology. We also plan on providing recommended guides that cater towards the user’s preferences based on the information that they have provided in their user profile or through the use of search terms. The policies that the hotels/restaurants have will also be displayed initially rather than after everything has been planned in order to prevent the need to replan everything from scratch. In case the user needs to replan while in the middle of a schedule, they can do as such, and request new schedules to be generated for the remainder of their trip.

### 7. High-Level System Requirements

* **Server Host**: Google Compute Engine 2vCPU 2 GB RAM
* **Operating System**: Ubuntu 18.04 LTS
* **Database**: MongoDB 6.0
* **Web Server**: nginx 1.23.3
* **Server-Side Language**: JavaScript
* **Web Application Framework**: Express 4.18.2
* **Front-End Framework**: React 18.2.0
* **API:** Google Maps API
* **IDE**: Visual Studio Code
* **Browsers:** Chrome, Edge, Firefox, Safari

### 8. Team:

* Team Lead: Jay Gupta
* GitHub Master: Devin Kern
* Scrum Master: Essa Husary
* Backend Lead: Justin Wang
* Frontend Lead: Kevin Liu
* Backend/Frontend Developer: Brandon Khuu
* Study Groups and Milestones:
  + Google Compute Engine: The study group comprises the whole team. Milestones included having the website deployed on a virtual machine instance by the due date of Milestone 0, and the next milestone is to use process management and various other tools to horizontally scale on Compute Engine, such that many users can simultaneously run the application without significant delay. We plan to complete this milestone by the due date of Milestone 2.
  + Database/Backend: Justin, Brandon, and Devin are going to be part of a study group for the topics pertaining to Node, MongoDB, and Express. They will work on the first milestone of serving data from the MongoDB database to the frontend; for instance, sending an example schedule in the form of a JSON object to the frontend. Then, the next milestone will be working on sending a query to the backend, which will supply this query to the database and return the appropriate results to be shown on the frontend.
  + Frontend: Kevin, Essa, and Jay are going to form this study group; the first milestone was creating the initial website for Milestone 0, displaying information on each member and the team. The next milestone will be setting up more pages on the frontend, such as a registration/login screen for users, and search functionality to generate schedules based on variables. This initial milestone will consist of understanding React fundamentals such as state; the variables will be used and create sample schedules that incorporate these variables somehow (backend won’t be involved initially). Then, the next milestone will be sending these variable values to the backend in the form of a query, and then getting the resulting schedules in the form of a JSON object and changing the frontend state to show these schedules.

### 9. Checklist

* Team found a time slot to meet outside of class (DONE)
* Scrum Master shares meeting minutes with everyone after each meeting (DONE)
* GitHub master chosen (DONE)
* Everyone sets up their local development environment from the team’s git repo (DONE)
* Team decided and agreed together on using the listed SW tools and deployment server (DONE)
* Team ready and able to use the chosen back/front-end frameworks (DONE)
  + for each technology, team decides who will lead the study of each technology and what will be the specific goal of study within one month from the M1 announcement (DONE)
  + study plan: in team section (DONE)
* Team lead ensured that all team members read the final M1 and agree/understand it before submission (DONE)