Townie

Team 27 - Product Backlog

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Problem Statement

Friends and families are always hard-pressed to get time to spend together, and when they do, there is often pressure to do something that vindicates having that time. Our project aims to give groups and individuals alike a means of spending that time in a fun and exploratory way. We want to develop a platform that surprises users with exciting and engaging opportunities while encouraging them to be adventurous and spontaneous.

Background Information

Audience

People everywhere are looking to create memorable experiences with their friends and family, whether it be planning huge trips or small outings. The world is a smaller place, and the possibilities are seemingly endless, so this app is for anyone who wants a day focused on having a great time instead of weighing the costs and benefits of their plans.

Similar Platforms

There are several platforms in existence with the goal of helping people plan trips. Wanderlog is an app that allows a user to enter a city and pick locations, which it will then map out for a road trip. It also allows the forming of groups. Tripadvisor gives rating-based recommendations for fun things to do in an area with themed searches like restaurants or museums.

Limitations

These apps are very useful in their own right for planning trips, but they still place the decision on the user. Our app is fundamentally different in this way, as it compiles a day, with a customizable time frame, of activities in an area. Not only this, but it creates a game out of this by not handing over its compiled day immediately, but rather rewarding users for finding the locations and exploring the surrounding area.

Requirements

Functional:

1) As a user, I would like to create an account.
2) As a user, I would like to add/change my profile picture.
3) As a user, I would like to sign into and manage my account.
4) As a user, I would like the game to remember a previous login and start at the home page.
5) As a user, I would like to delete my account.
6) As a user, I would like the option to reset my password if I forget it.
7) As a user, I would like to view my profile.
8) As a user, I would like to know if anyone I might know also has an account and befriend them.
9) As a user, I would like to provide two-factor authentication.
10) As a user, I would like to verify my account email on creation.
11) As a user, I would like to choose if my exact location remains private.
12) As a player, I would like to input a location as a parameter so the system can narrow its focus in picking locations.
13) As a player, I would like to input themes as a parameter so the system can parse through locations with an emphasis on those themes.
14) As a player, I would like to rate specific themes.
15) As a player, I would like to have a random theme chosen that could be chosen as a result of satisfaction rates with previous themes.
16) As a player, I would like to specify a budget so the system can steer away from locations that would violate that budget.
17) As a player, I would like to specify a time frame so the game knows how many locations to pick and roughly how far apart those locations can be.
18) As a player, I would like the search radius to shrink proportional to the time frame.
19) As a player, I would like points earned to scale with time spent searching (more points for quicker times) .
20) As a player, I would like a timer for how long it has taken both for the whole game and for the location at hand.
21) As a player, I would like to specify a general radius.
22) As a player, I would like to specify a mode of transportation.
23) As a player, I would like to share my trips online (social media platforms).
24) As a player, I would like to gain points for each successful guess.
25) As a player, I would like to spend points to update the UI.
26) As a player, I would like to have a ranking system based on how many games I have played.

27) As a player, I would like to be given the opportunity to "pause" the game to enjoy the location.
28) As a player, I would like to be given the opportunity to skip a location.
29) As a player, I would like the ability to change the time frame after starting the game.
30) As a player, I would like to "peek" at a location in exchange for a number of points I have earned.
31) As a player, I would like to export the general radius of a location to google maps so I can use navigation.
32) As a player, I would like a viewable log of my trips.
33) As a player, I would like the game to curate some fully premade levels.
34) As a player, I would like the ability to end the game early.
35) As a player, I would like the destination radius to shrink as I approach the destination.
36) As a player, I would like the game to notify me when I have reached the location.
37) As a player, I would like to rate my satisfaction with the destination.
38) As a player, I would like to know an estimation of how long it would take to get to the first location.
39) As a player, I would like to know some fun facts about the location in which I have arrived.
40) As a player, I would like the game to form days for me without my instantiation, serving as an impromptu adventure. I would like the game to do this once a week.
41) As a player, I would like a casual version which puts together a fun day with or without a theme, without hiding anything (like an impromptu itinerary for the day).
42) As a player, I would be alerted if any friend, past acquaintance, or friend of friend happens to be on the app and would like to form a group.
43) As a player, I would like to see the map with my current location and the destination radius.
44) As a player, I would like for the game to have a tutorial with the ability to replay the tutorial using a help button.
45) (If time allows) As a player, I would like to use my points to earn gift cards from locations.
46) As a group player, I would like to add other users as friends.
47) As a group player, I would like to be able to share a day with friends and family.
48) As a group player, I would like to be able to keep track of where my friends are.
49) As a group family player, I would like to form groups online with family.
50) As a group player, I would like to form groups with other people looking to play the game.
51) As a group player, I would like to discuss with other people on where to meet up to play the game.
52) (If time allows) As a group player, I would like to have a chat for me and my friends to communicate.

Nonfunctional:

Performance: Architecture, Scalability, & Hosting.

In order to ensure that our application remains performant as it scales, we have devised the following system architecture.

To produce our frontend, we will be using Svelte, a JavaScript framework that will compile our code directly to highly optimized, imperative JavaScript. Svelte, unlike other JavaScript frameworks, does not rely on the virtual DOM and because of this, is one of the most performant frameworks out there for creating web UIs. As for hosting our Svelte application, any web hosting service, such as AWS Lightsail, should be able to scale quickly and efficiently.

For our backend, we will be using Django, a python-based web framework promising exceeding scalability and boasting a wide range of security features. This server will enable clients to set up a web-socket connection for group sessions, respond to client requests, and occassionally trigger our location-to-itinerary web-scraper which will be baked into the server's codebase. To enhance user authentication speeds and enable group WebSocket functionality during horizontal scaling, we will use a Redis instance, likely on AWS ElastiCache, to cache user authentication tokens and act as a pub-sub system for our Django instances.

This Django backend will be hosted on a cloud service that utilizes serverless computing, such as AWS Lambda, meaning that the application will automatically scale horizontally and utilize additional resources as it needs. Additionally, as is the case with AWS Lambda, we will also have the option to scale our instances vertically if need be. We are striving to maintain a server response time within 300 ms, allow users 24 hours a day, and be able to handle 10,000 to 15,000 simultaneous requests.

For our database, we will be storing 2 items: user data (account info, relationships, past itineraries) and past itinerary information from the web scraping layer (act as a cache of sorts to avoid triggering the slow web-scraper). Because of the various social aspects we have planned for our application, we would like our database to make storing and acting upon relationships like friend circles and past groupmates exceptionally performant. Because of this we are opting for a graph database, such as Neo4j, to store user information. Neo4j will be a good option for a graph database as it is one of the most popular out there, and boasts an "unbounded architecture" that ensures seamless horizontal scaling and manages to be ACID-compliant. As for storing "cached" itinerary information, this will also live on Neo4j as it will allow us to easily tie users to their past routes and itinerary preferences. For hosting this database, we plan to use AuraDB, Neo4j's own product that aims to take full advantage of their fast, scalable technology.

Security

Security is imperative for Townie, since it will deal with personal information and location data. The Django framework is equipped with several security features, such as Cross site scripting protection, cross site request forgery protection, SQL injection, and several others. Additionally, we plan to use OAuth 2.0 to authenticate requests with a token and ensure our site is not being abused. As the application does not require any roles besides players, permissions in the app will be consistent for everyone, and players will only be given the tools to play, nothing that can be used more maliciously.

Usability

The interface should be simplistic and intuitive to use with minimal clutter. We plan on using Svelte Material UI to design the app's interface. The initiation of the game will move in a linear fashion that will guide the user through the process. Once a game has been started, it will be presented front and center, taking a greater priority of the space on the site while still allowing other features to be accessed midgame.