Abstract

Date-Market: A Solution to Date Repetition

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Date-Market is a crowd-sourced marketplace for personalized date itineraries. The aim of the project is to solve the all too common issue of repeating dates when creativity is lacking or when novel ideas seem risky. With a reputation based, review-centric marketplace, the stress associated with planning a date will be alleviated as users can choose and be sure that they will be provided with an enjoyable itinerary.

Date-Market is composed of two types of users, requesters and planners. Requesters are users of the site that request date itineraries from planners. Planners are users of the site that plan itineraries for requesters for a fee. By default, users of the site are requesters, but every user has the option to activate a planner account.

Throughout the development process, Date-Market has been built with scalability and security in mind. To allow for future scaling, Date-Market has been built on the MEAN Stack as a REST API making it platform independent. Asynchrony underlies the majority of this API. To ensure security, careful authentication and meticulous validation of user input has been implemented at both the server and database level.

Date-Market has the potential to revolutionize date planning. Rather than settling for the status quo and ones classic dates, users will be inclined to try new, fun activities. In addition, Date-Market will facilitate travel planning by providing users with locally sourced itineraries. Best of all, Date-Market is a source of income for planners.
Date-Market:

A Solution to Date Repetition

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Contents

Acknowledgements v

1 Features 1
  1.1 All Users/Requesters ........................................... 1
  1.2 Planners ......................................................... 1
  1.3 Requests ......................................................... 2
  1.4 Itineraries and Events .......................................... 2
  1.5 Reviews .......................................................... 3

2 Technology 4
  2.1 Data Model ....................................................... 4
    2.1.1 User .......................................................... 5
    2.1.2 Planner ....................................................... 5
    2.1.3 Request ....................................................... 5
    2.1.4 Itinerary ...................................................... 5
    2.1.5 Event .......................................................... 5
    2.1.6 Place .......................................................... 6
    2.1.7 Specialty ..................................................... 6
    2.1.8 Category ..................................................... 6
    2.1.9 Message ....................................................... 6
    2.1.10 Itinerary Review and User Review ......................... 6
2.2 Passport.js and Hackathon-Starter Kit  ..................... 7
2.3 Google Places API  ............................................. 7
2.4 Testing  .......................................................... 7

3 Scalability  .................................................. 8

4 Security and Validation  ........................................ 9

5 Future Work  .................................................. 10
  5.1 Development of User Interface  ................................. 10
  5.2 Payment System  ............................................... 10
  5.3 K-means Clustering  ............................................. 11
  5.4 Foursquare, Yelp, Instagram Integration  ..................... 11
  5.5 Elite Status for Planners  ..................................... 11
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Chapter 1

Features

Date-Market requires the creation of an account to access any/all of the features. Currently, Date-Market offers the following features:

1.1 All Users/Requesters

- Create/edit a personal profile
- Link social media accounts
- Forgot/Reset password
- Link account to significant others account
- Request, finalize, and review date itineraries from planners
- Favorite/unfavorite planners
- Create planner account

1.2 Planners

- Deactivate/reactivate planner account
• Create/Edit/Delete pitch text

• Add/delete locations and specialties to/from profile

• Accept/decline itinerary requests

• Create events for itineraries

• Publish/unpublish itineraries

• Review requesters served

1.3 Requests

In order to receive a personalized date itinerary, a requester must first choose a planner based on ratings, specialties, price, and pitch text. The requester must then send a request to the specific planner. This request contains information pertinent to the planner and includes the city, date, start and end times, average activity level, maximum travel distance, and budget. Based on the sent request and the requesters average rating, the planner then chooses to accept or decline the request. Upon acceptance of a request, a blank itinerary is created for the planner to begin working on.

1.4 Itineraries and Events

In Date-Market, itineraries are structured as a list of events. Events have a title, a location, start and end times, planner notes, and a price (amongst many other attributes). Once a planner has prepared an itinerary with at least one event, the planner may publish the itinerary to the user. This allows the requester to view

1. Only one unanswered request to a specific planner can exist at a time. This prevents spamming.
the itinerary and to either finalize it or ask for a revision (if revisions are allowed). After a requests end time passes, if an itinerary is published, the itinerary will be automatically finalized. In the future, once an itinerary is finalized, payment will occur.

1.5 Reviews

Upon finalization of an itinerary, interacting users have the opportunity to rate one another. Requester reviews of planners and their itineraries are public, whereas planner reviews of requesters are private, and can only be viewed by other planners when a request is made. This system is intended to ensure user quality and allow discrimination of good and bad users.
Chapter 2

Technology

Date-Market was built on the MEAN Stack, which is composed of MongoDB, Express.js (back-end web app framework), AngularJS (front-end MVC framework), and Node.js (scalable server platform). Rather than interface with MongoDB directly, however, Date-Market utilizes Mongoose.js, a schema-based, object-modeling wrapper written for Node.js. Outside of Mongoose, a number of packages were utilized to increase security and reliability. Packages of importance are Passport.js and Google Places. In addition, development of the application began as a fork of the hackathon-starter kit, which was changed completely to support a REST API and testing. To test the API in a behavioral driven way, Mocha, Chai, and SuperTest packages were used.

2.1 Data Model

While MongoDB does not require or truly support schemas, as it is a non-relational database, Mongoose.js (a popular MongoDB wrapper for Node.js) interfaces with MongoDB using schemas and queries similar to those in a relational database. All data within the application is included in 11 schemas: User, Planner, Request, Itinerary, Event, Place, Specialty, Category, Message, Itinerary Review, User Review.
2.1.1 User

The User model holds each users personal information, social media tokens, reference to linked significant other, and references to other data models, including the users planner account, received reviews, favorite planners, requests made, and itineraries received.

2.1.2 Planner

The Planner model holds the planners pitch text, price, allowed number of revisions, status, and references to the planners user account, locations, specialties, itineraries created, and received reviews.

2.1.3 Request

The Request model holds pertinent data like start time and date, max budget, and activity level as well as references to the planner, requester, and location.

2.1.4 Itinerary

The Itinerary model contains event list versions, which are arrays composed of references to individual events. It also contains status of the itinerary and references to the planner, requester, request, and reviews (itinerary and user).

2.1.5 Event

The Event model contains references to the planner and itinerary as well as relevant data such as notes, location, title, and event times.
2.1.6 Place

The Place model contains a reference to the creator as well as location information and the corresponding Google Id for the place.

2.1.7 Specialty

The Specialty model contains a reference to the creator as well as a lowercase name for the specialty.

2.1.8 Category

The Category model contains a lowercase name for the category.

2.1.9 Message

The Message model contains message text and references to the author and the associated itinerary.

2.1.10 Itinerary Review and User Review

The Itinerary Review and User Review models contain message text and references to the author, the user being reviewed, and the associated itinerary.

Figure 2.1: UML Diagram of Schema Relationships
2.2 Passport.js and Hackathon-Starter Kit

In order to create a secure authentication system capable of linking social media accounts, Date-Market began as a forked version of the hackathon-starter kit. This kit contained authentication schemes for major social media outlets through Passport.js. Passport.js is the standard authentication package for Node.js, and so, in keeping with Node.js standards, this authentication scheme was kept and the workflow around it largely refactored to be RESTful and testable.

2.3 Google Places API

The Google Places API and package are instrumental to Date-Market. To prevent fake locations being inputted into the application, all place user input data is verified and/or replaced by the Google Places API result. Some of the data from this service is cached, but is refreshed every 30 days in order to follow the terms of service.

2.4 Testing

Node.js and Express.js are built to be easily testable using TDD/BDD with SuperTest, Mocha, and Chai. As such, all routes of the API, all validation functions, and some models are tested using Behavioral Driven Development. The tests ensure that only valid use of routes and valid input by authenticated users is permitted. At the time of writing, there exist more than 260 passing tests corresponding to the features listed above.
Chapter 3

Scalability

Date-Market was built to be scalable not only in terms of community, but also in terms of users. At the foundation of Date-Market is crowdsourcing, which is inherently scalable because it relies on the knowledge/use of a large, diverse population. In this way, the general structure of the Date-Market lends itself to international expansion with little to no change to the codebase because in all places the same general idea of leveraging knowledgeable locals to plan date itineraries is true. With regard to user base, Date-Market should be able to scale to tens, if not hundreds, of thousands of users easily. A strength of Node.js is the scalability inherent to its asynchrony, and this fact played a crucial role in the decision of using the MEAN stack.
Chapter 4

Security and Validation

Date-Market was built with security in mind. As such, the Date-Market API is secure and requires user authentication with each API call in order to prevent unwanted activity from the internet at large. In addition, all user input and route parameters are validated before reaching a state where are saved into the database.

Outside of user authentication and automated validation, functionality for flagging users, planners, reviews, request, events, places, categories and specialties was started and could be easily finished. The decision to leave this as future work, however, was made after the realization that allowing flagging would require a manual review process which is not scalable/possible as of now.
Chapter 5

Future Work

While Date-Market is currently limited to an API, there is a lot of passion behind the project and hopes to make it into a full-fledged web application by the end of Fall 2015. Significant progress has been made during this semester, but there is still a long road of development ahead. Future work includes:

5.1 Development of User Interface

A sleek, minimalist design for the web application has been mocked out on paper, but needs to be further explored in digital renderings. Once the design is validated and finalized through user testing, it will be translated into a functional, front-end in HTML5 and AngularJS.

5.2 Payment System

A payment system similar to that used by Uber still needs to be implemented for Date-Market. Two potential options that have been explored are Stripe Connect and Braintree, both of which allow for automated payouts to a large number of users. Payment details will definitely be handled by one of these third party services to
reduce the liability of and implementation overhead for Date-Market. User accounts with these payment services will be linked to user profiles. A verified account with the payment service will be required before a request to a planner can be made because payment will occur automatically upon creation or finalization of an itinerary.

5.3 K-means Clustering

To help requesters find planners that have similar interests to themselves, all users will be clustered. The results of this clustering will influence the order of planners presented to users on the search page. During this semester, k-means clustering was researched, and a variety of packages exist that should make it a quick addition.

5.4 Foursquare, Yelp, Instagram Integration

Users can already link their Foursquare and Instagram accounts, but to provide requesters and planners with more information about and memories from events and locations, truly integrating these social media apps into the site has been considered.

5.5 Elite Status for Planners

In order to provide requesters with more information on planners specialties, creating functionality to make planners become elite in certain areas based on their ratings and itineraries has also been considered.