Product Backlog - Team 14

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Problem Statement:

The Chicago Police department is interested in understanding trends and making correlations based on the data they have collected over the past few years. Thus, we are developing an application which will conduct data aggregation and analysis on the collected data. Then, providing heat map visualizations that allow comparison of multiple clustering results, this will enable the police department to identify and visualize relationships and patterns more efficiently.

Background Information:

Audience

Our target users consist of both the general public and police officers. The general public is interested in criminal activity information and looking for relatively safe homes in Chicago area through the application. The police officers can obtain valuable information and learn about different patterns and density regarding crime in the district by filtering using race, gender, age, crime type, time range, and so forth.

Similar Applications

There is an existing application called CLEARMAP Sex Offenders which enables the user to search the Chicago police department's database for registered sex offenders. Trulia is mainly focus on theft, assault and arrest rate to help users while they search for house purchasing. Chicago Data Portal separates different types of crime such as gun crime and general crime in several pages to provide more distinguish functions according to the type that the user would like to search for.

Limitations

The limitations of the various applications we have listed above are mostly just missing some functionality that we think would help improve the overall usage and efficiency of the application. CLEARMAP Sex Offenders does not differentiate the users. Besides that, Chicago Data Portal and Trulia lacks different user filters.

Requirements

Functional

1. As a user, I would like to log into my account.
2. As a user, I would like to logout of my account.
3. As a user, I would like to see a dashboard containing crime categories on the main page.
4. As a user, I would like to switch between different crime categories first, for example sex offenders, burglaries, shootings, etc.
5. As a user, I would like to view the different categories' crime data as a heat map.
6. As a user, I would like to see crime density from the heat map based on color.
7. As a user, I would like to see crime occurrence pattern from the heat map.
8. As a user, I would like to see the trending of a certain crime type and frequency.
9. As a user, I would like to be able to see different types of points with the longitude, latitude and time.
10. As a user, I would like to the maps to have basic map functionality like Google map where you can see street addresses, Satellite images, zoom in, zoom out and selectable.
11. As a user, I would like a different zoom in view from the zoom out view.
12. As a user, I would like to be able to export the maps I have aggregated in PDF.
13. As a user, I would like to filter crime data by race.
14. As a user, I would like to filter crime data by gender.
15. As a user, I would like to filter crime data by age.
16. As a user, I would like to filter crime data by crime type.
17. As a user, I would like to filter crime data by crime occurrence.
18. As a user, I would like to filter crime data by time range(crime occurs within certain days or between certain customized dates)
19. As a user, I would like to filter crime data by area given center and radius.
20. As a user, I would like to have either thematic/reference type of maps as visualization of crime data after filtering.
21. As a user, I would like to be able to do multiple aggregations (filters).
22. As a user, I would like to be able to upload heatmap points, which builds a temporary entity with mapping section id.
23. As a user, I would like to see the map rendered with the section id.
24. As a user, I would like the geocoding engine to check if it is a purified address (eg. 3500 S Michigan is actually 3500 S Michigan Ave) and if this address exists in the database.

25. As a user, I would like the geocoding engine to be able to save the non-purified address as an alias of the address.
26. As a user, I would like to like the purified address and all its aliases to have one id number.
27. As a user, I would like to be able to cache the address if repeated calls are made to the address.
28. As a user, I would like to be able to define polygons of different districts such as US postal, zip code, police district etc.
29. As a user, I would like to pre-calculate all the zones that the address(longitude and latitude) belongs to.
30. As a user, I would like to see what polygon contains the uploaded / inputted point/address.

Non-Functional

1. As a developer, I would like the server to be able to deny any unauthorized requests
2. As a developer, I would like the application to be maintained easily
3. As a developer, I would like the framework to be reusable
4. As a developer, I would like the developed APIs to be general to other crime data
5. As a developer, I would like the APIs to be deliverable
6. As a developer, I would like the data to be securely protected
7. As a developer, I would like the application to be hosted on a cloud provider
8. As a developer, I would like the database to be hosted on a cloud provider.
9. As a developer, I would like to be able to extract and read the data provided by the company.
10. As a user, I would like the application to be user-friendly
11. As a user, I would like the application to respond in a timely manner.
12. As a user, I would like the application to be available 99.99% of times that I try to access it.
13. As a user, I would like an easy to use interface.
14. As a user, I would like to have an instruction manual.
15. As a user, I would like the application to return meaningful error message for any inappropriate user action.

Scalability
Since we separate frontend and backend, backend will be developed in a way that it provides API for access and thus may be connected and used by platforms other than the websites, such as apps on smartphones, software on PC.
Because we will deploy MongoDB for our backend and MongoDB is a NoSQL database, we can add any feature to the data later easily.

Usability
We should develop a friendly interface as frontend as well as eliminate unhelpful features that mostly exist among our competitor applications to make the whole website easy for average users to understand and use.
Based on the most recent voted predefined map of the users, we will automatically generate a set of predefined maps and quick access of different type of filters, which will make filtering process faster and easier.

Response time
The backend system will use object relational mapping classes to manipulate data. We have to decide essential classes to make, which will not hurt the comprehensiveness of our product nor the speed of retrieving data. For retrieving address, the average response time is supposed to be less than 5 seconds even through our database is huge and the response can increase as the database grows.

Security
We really handles all information carefully since all of the data are very critical and sensitive. Therefore, to use the site, we cooperate with the Chicago Police Department and instead of getting their credentials, we will add our test credentials into the their database to ensure to both ensure the site running security but not exposing their credentials.