Moving Towards City Data Transparency and Neighborhood Awareness

Category: **Software as a Service**

Problem Definition

The City of Chicago open data portal provides various types of data about the city.

There are millions of records and it is consistently updated.

However, this massive data source cannot be used without expertise.

Chicagoans have to rely on experts to make reports about the data and gain useful insights.

Chicagoans want to be able to follow and be aware of what is happening in their neighborhood on a daily/weekly basis.

Our solution

- Observing the immense data sources on Chicago's daily problems and how insufficiently they are being used, we propose a framework to help non-experts gain useful insights and subscribe to receive notifications based on analyzing the available data.

- Our solution uses data on Chicago problems to address the transparency issue and provide direct engagement with residents of Chicago to increase their awareness of what is happening in their neighborhood through a simple and user-friendly interface.

City of Chicago Open Data Initiative

The Open Data Executive Order (No. 2012-2) issued on 12/04/2012 states that:

> "The City of Chicago is committed to creating an unprecedented level of transparency, honesty and accountability to the public in City government"

> "Each city agency shall, …, make available online, through the City of Chicago data portal required under Section 6 , …, all appropriate data sets and associated metadata, …"

> "the timely online publication of public data will empower Chicago's residents by providing them with information necessary to participate in government in a meaningful manner, to assist in identifying possible solutions to pressing governmental problems, and to promote innovative strategies for social progress and economic growth"

Achieving transparency by publishing the data remains incomplete without mechanisms that allow members of the society to understand and get meaningful insights from the published data, therefore allowing the public to participate, be aware and possibly find solutions to the problems in the city.

OpenGrid

OpenGrid is an open-source, interactive map platform that allows users to explore multiple data sources. It was developed by Chicago's Department of Innovation and Technology to support situational awareness, incident monitoring and responses, historical data retrieval, and real-time advanced analytics.

Drawbacks:

❏ Requires knowledge of database domain-specific language such as SQL
❏ Does not keep users updated about changes

Chicago Data Portal

The open data portal was established under an Executive Order signed by Mayor Rahm Emanuel on December 10, 2012.

It is the basic data source used in OpenGrid. It contains a broad collection of data sets on different departments of the city.

Drawbacks:

❑ Shows raw collected data without giving insights or tools to manage the immensity and complexity of that data

311 Service Request

Through this tool, Chicagoans can request, track, and explore Chicago non-emergency services. It contains three sections: one for requesting a service, one for exploring requested services all around the city, and one for articles about the problems reported.

It also has many different departments such as Animals, Health, Public Safety, and etc.

Drawbacks:

- ❏ Lists the results on a map
- ❏ No aggregated results or insights are shown

CHI ★ 311

NextDoor

Nextdoor is a privately-held company based in San Francisco founded in 2011.

It provides a social network for the neighborhoods enabling local conversations among neighbors through which they can know each other and build communities.

Drawbacks:

- ❏ **Depends on neighbors cooperation**
- ❏ **Does not rely on data**
- ❏ **Relies on messaging others similar to a social network**

NeighborhoodScout

provides a platform for crime, demographic, housing, school performance, real estate trends, and forecast analytics with a focus on neighborhood values and investments.

Drawbacks:

- ❏ Only useful for experts
- ❏ Limited categories
- ❏ No reporting tools
- ❏ High cost

UChicago Urban Labs

works with partners to address the challenges across five dimensions of urban life: crime, education, health, poverty, and energy & environment.

Drawbacks:

- ❏ Useful for city-wide projects
- ❏ Does not provide insights for individual users
- ❏ Specific to five categories

Block Club Chicago

Block Club Chicago is a nonprofit news organization dedicated to delivering nonpartisan and essential coverage of Chicago's diverse neighborhoods.

It strives to build community through providing local news and ground-level reporting of the city's neighborhoods.

Drawbacks:

❏ Stories are picked at the editor's discretion. It does not cover all the problems that are reported by Chicagoans.

THE BLOCK CLUB
a blog about Chicago neighborhoods

Existing Competitions

❏   **Neighborhoodscout is mainly used for real estate purposes.**
❏   **NextDoor is used as social networks for different neighborhoods.**
❏   **Book Club Chicago is a news outlet.**
❏   **UChicago Urban Labs partners with groups for specific projects.**

Therefore, the main competitors are Chicago Data Portal, 311 Service Request, and OpenGrid.

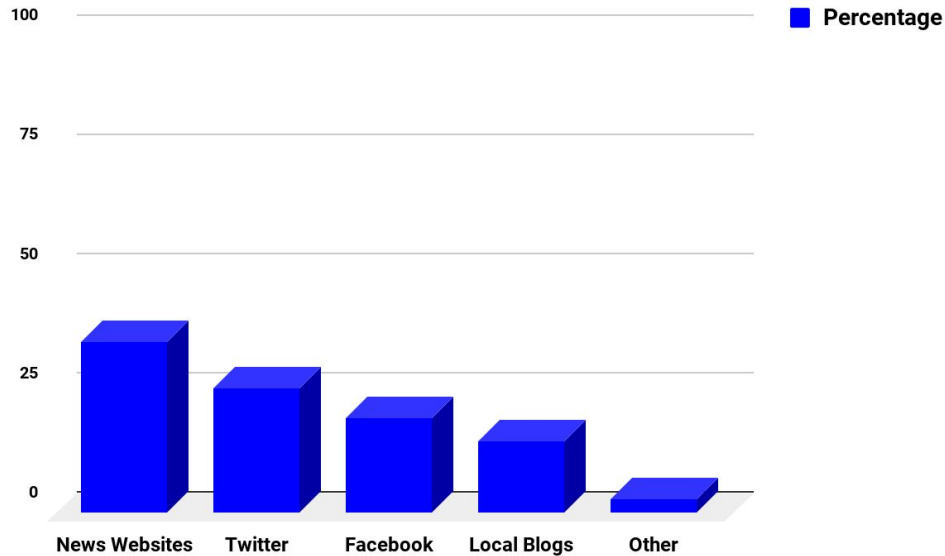**We interviewed 30 Chicagoans who have lived in Chicago for more than 5 years to see what they think of these three cases.**

11

Have you ever heard of Chicago Data Portal, 311 Service Request, and OpenGrid?
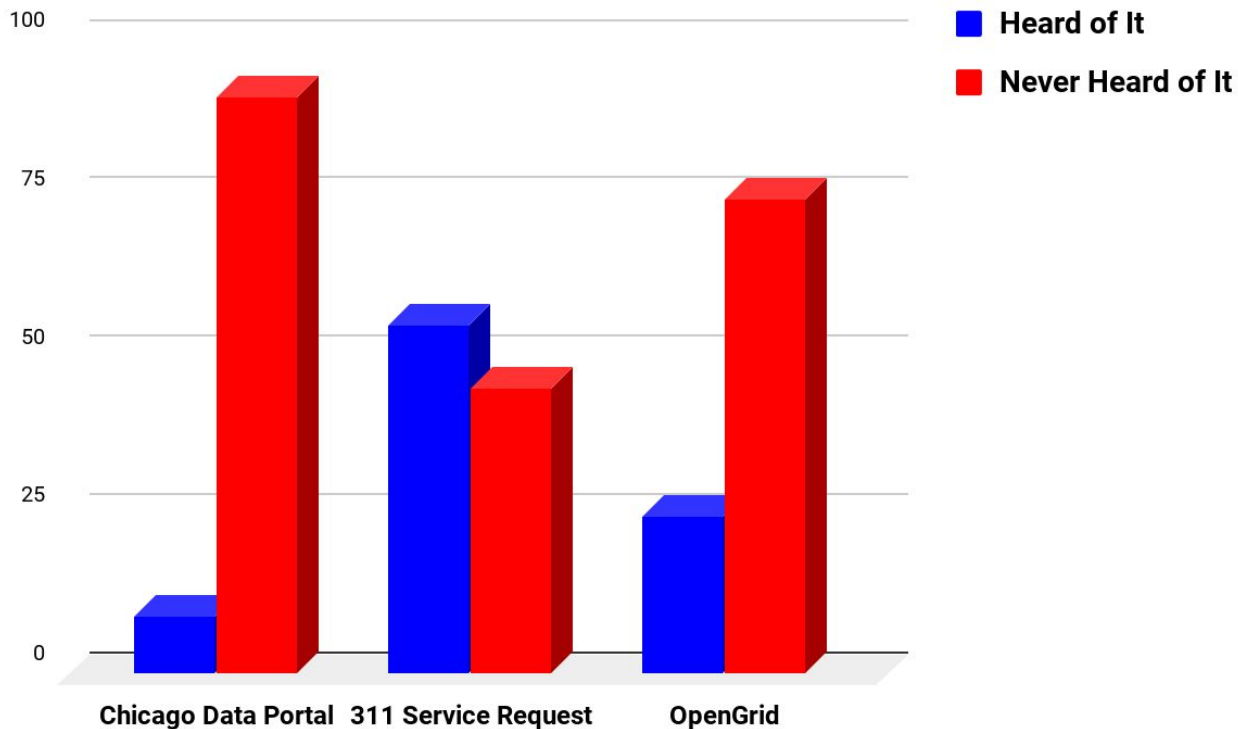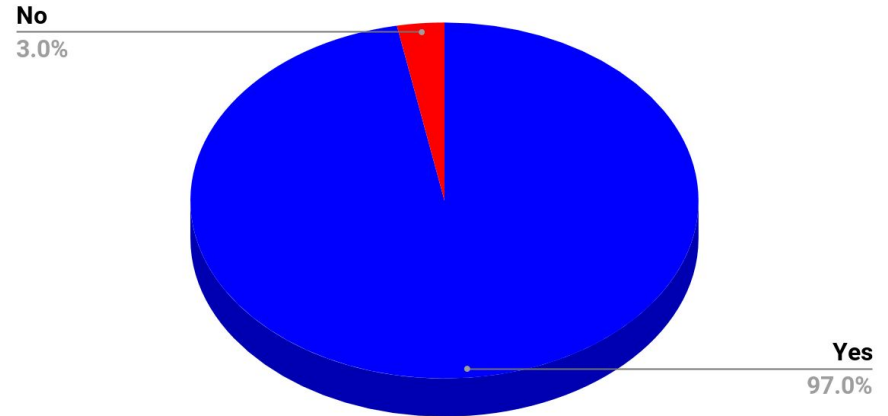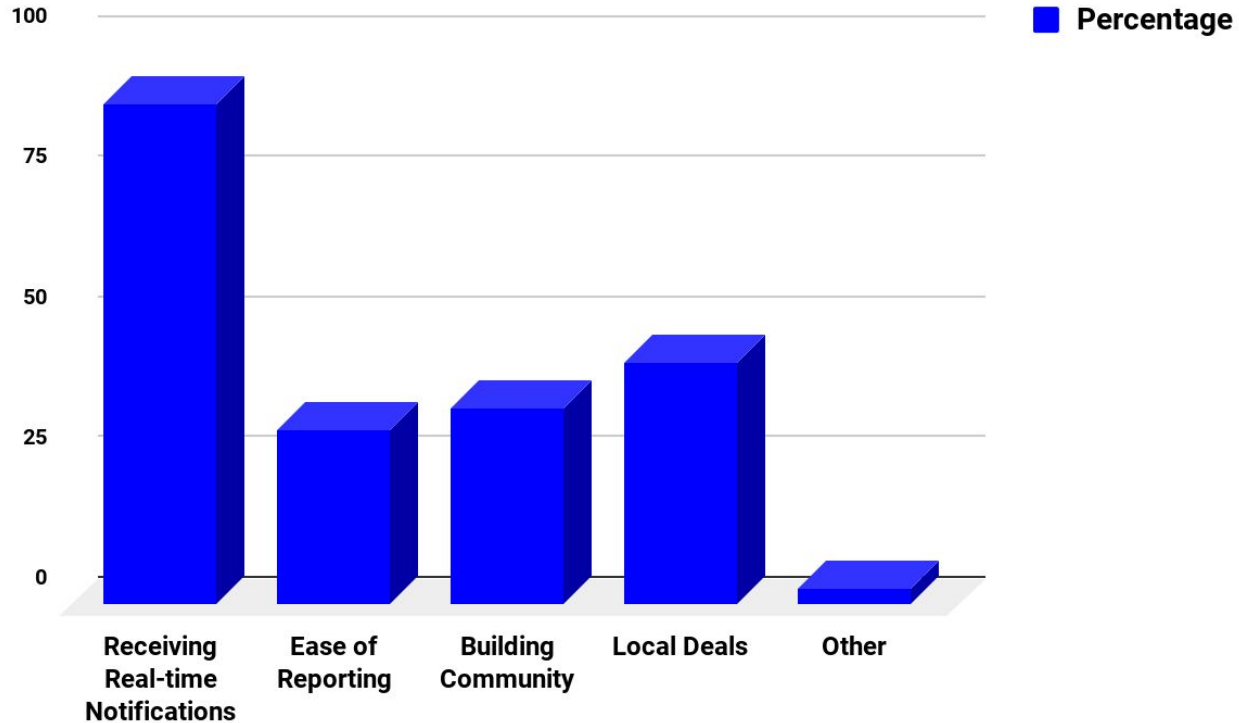
If you have heard of it, have you ever used it?
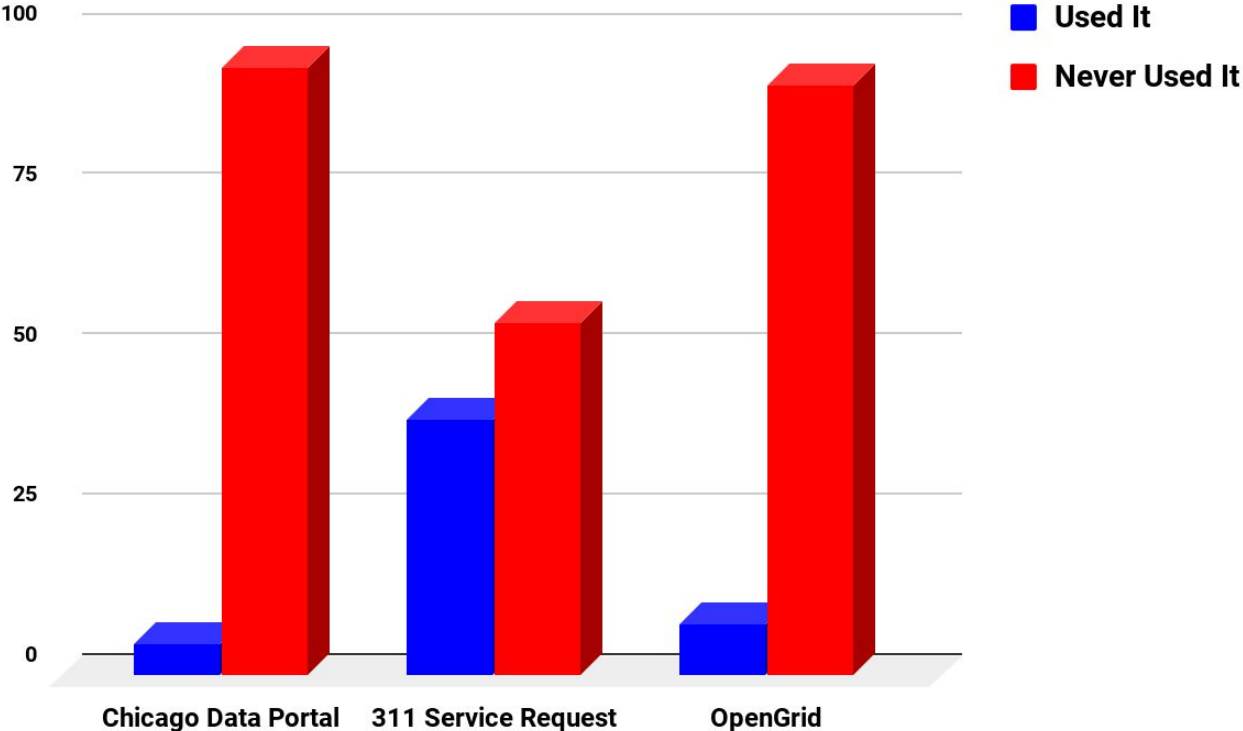
Where do you get your local news?

Would you like to receive more insights about your neighborhood?

Percentage

100

75

50

25

0

News Websites   Twitter   Facebook   Local Blogs   Other

No
3.0%

Yes
97.0%

What do you think needs to be improved when it comes to awareness about your neighborhood?

Synthesis

The reality of a neighborhood can be described more accurately when we use data. When the members of a neighborhood are better and more accurately informed, it creates possibilities that allow the society to function better and ultimately improve the lives of the people in that neighborhood.

Journalism & Awareness

- Journalists start noticing an issue when it is known to a sizable portion of citizens.

- It is a long process to gather data and analyze it to write an article about a problem in a city.

- Usually extracting hidden facts takes even longer.

- Smaller problems specific to one neighborhood may never be reported.

- There are issues that are not news but are important to know, for example, public safety alerts.
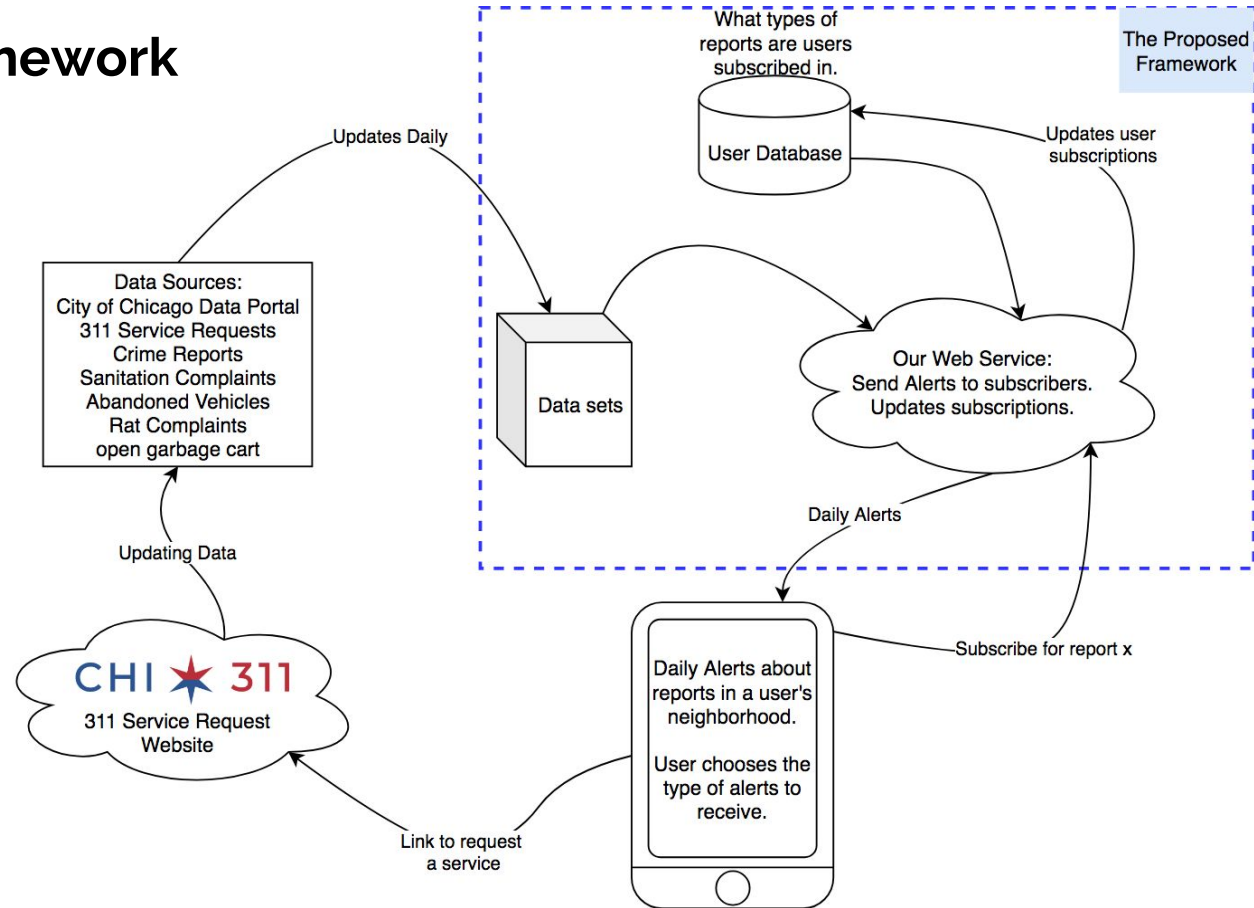
17

Journalism & Awareness II
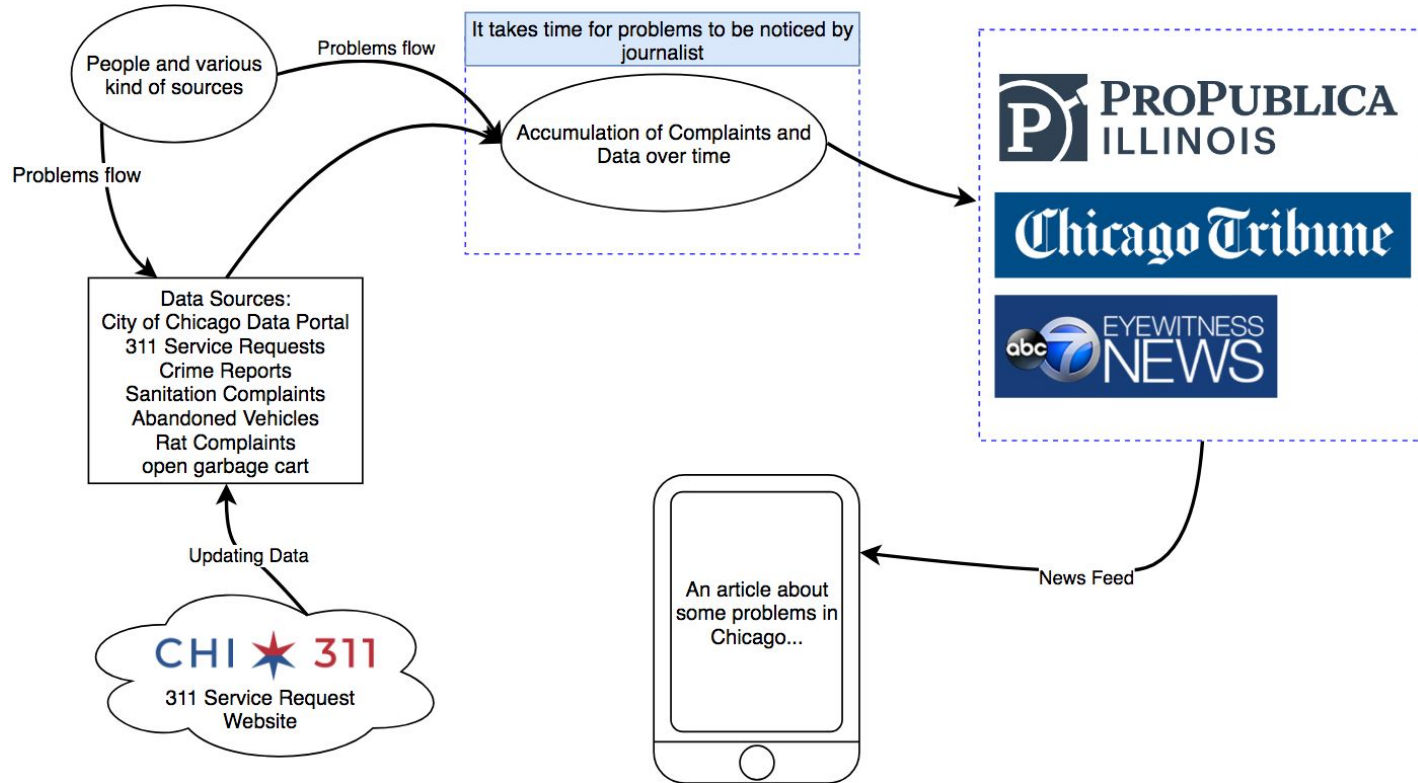
Our Proposed Framework

This diagram shows the flow of data from the various data sources to our platform and user.

The main data source is the public data available on City of Chicago Data Portal which itself feeds from CHI-311.

Our platform connects the user in real-time to the available data on Chicago portal.

Intellectual Property Research

Looking at previous software patents, we recognize that there are multiple hurdles that software must pass to be patentable.

However a patent opportunity could apply for our process of communicating relevant alert and aggregated scoring information to remote connected computer devices.

Software IP exists in this area. An example of patent *US20160328810A1* is shown here on the right.

Our solution is differentiated by aggregating data from multiple data sources and giving insights based on the user's subscriptions.
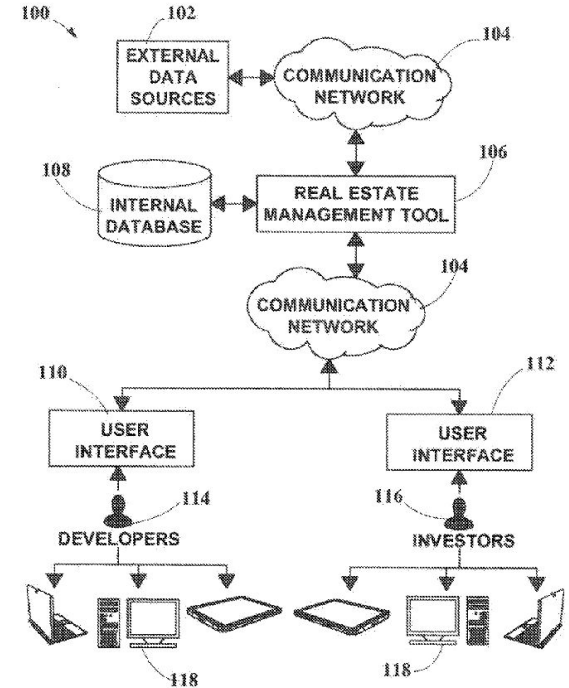
A case-study: Chicago Crime

Assume that a user is subscribed to our platform to receive alerts for Chicago Crime for "West Garfield Park" neighborhood.

Besides daily alerts, which the user gets on their phone using our app, they can also look into historic data to get insights.

Using a series of charts and graphs, we show how the user can gain insights about crime and safety in their neighborhood.

Case-study: Chicago Crime

Using our service, the following questions can be answered for a user who is living in West Garfield Park:

1. **What crimes constitute the highest frequency in this neighborhood? (ref. slide 23)**
2. **How does the frequency of crime change each month in this neighborhood? (ref. slide 24)**
3. **What are the patterns of change of top frequent crimes in this area? (ref. slide 24. You can see the dynamics of 4 types of crime and how the frequency of these crimes changes each month. For example, it seems that Narcotics are reported more in Summers compared to Winters, but for Criminal Damage, it is not the case.)**
4. **What month of the year is most likely for each crime to happen? (ref. slide 24)**
5. **Which streets are mostly known for what type of crime in this neighborhood? (ref. slide 25)**
6. **Selecting a crime type *x*:**
    a. **Which weekdays are common for crime *x*? (ref. slide 26)**
    b. **In which streets crime *x* occurs the most? (ref. slide 27)**
    c. **Which hour of the day is most likely for crime *x* to happen? (ref. slide 28)**

Chicago Crime, West Garfield Park
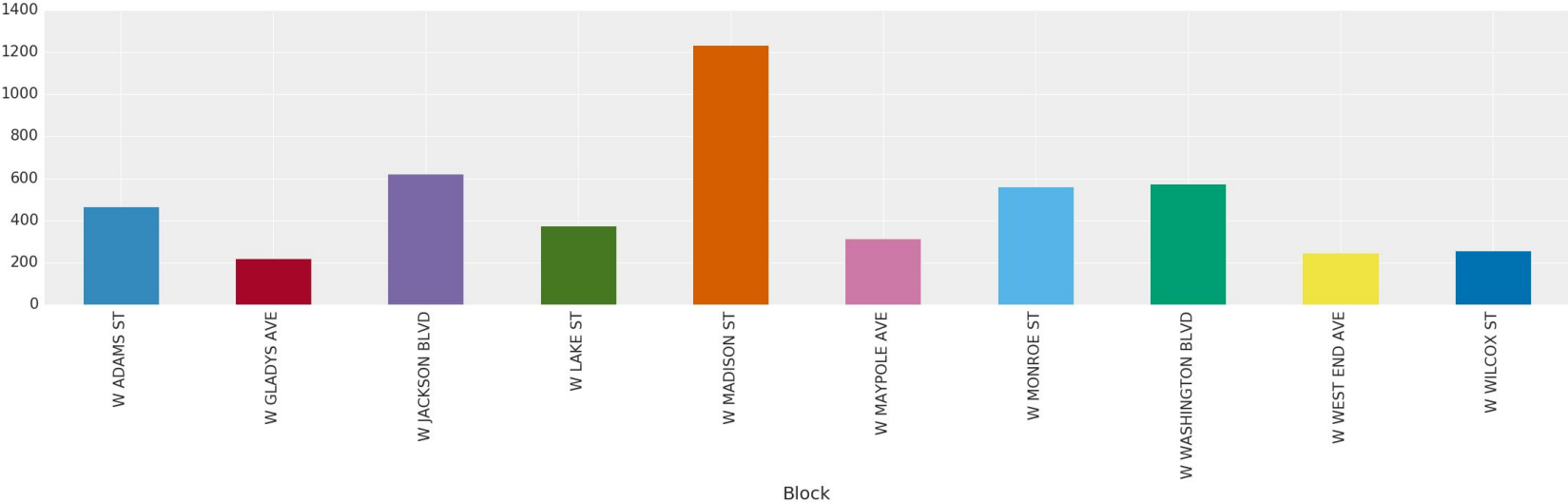# Frequency of Crimes by Type in 2018

23
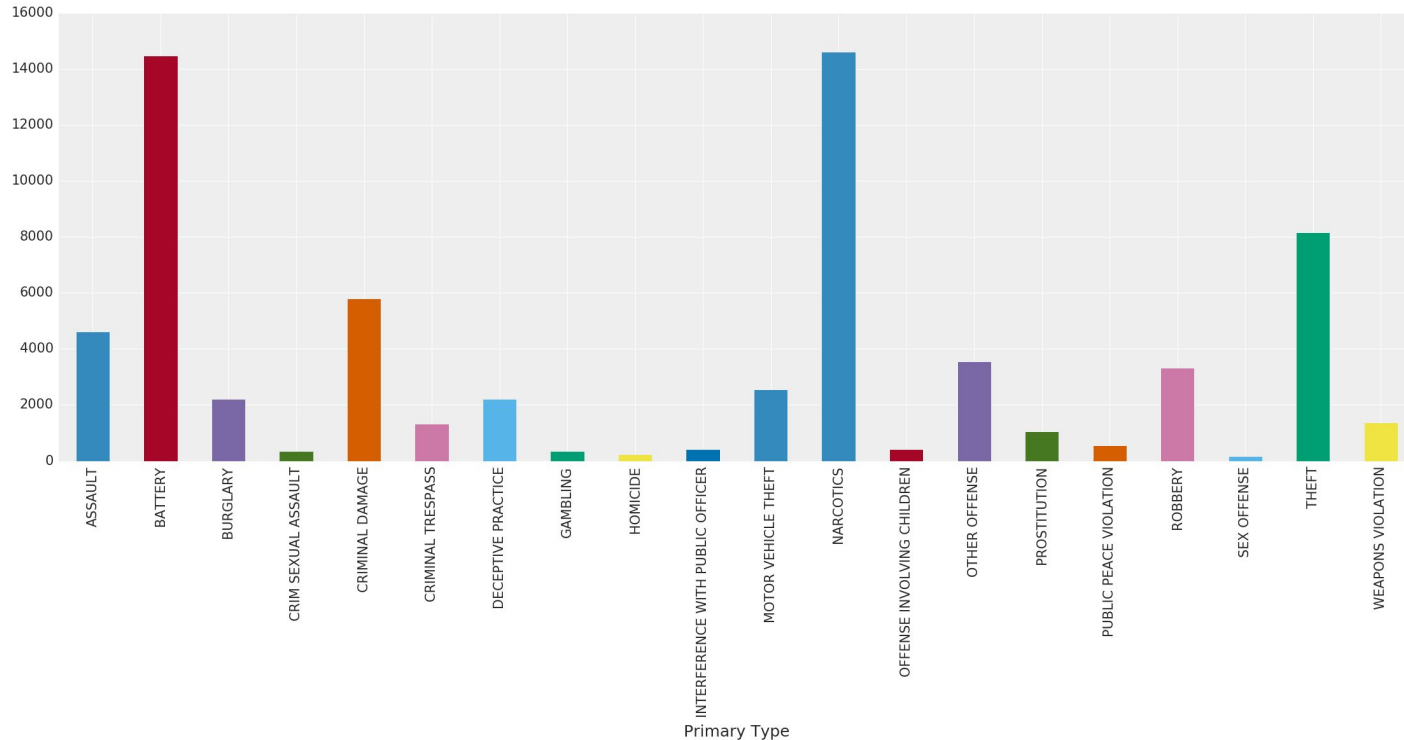
Top Frequent Crimes Over Time in West Garfield Park

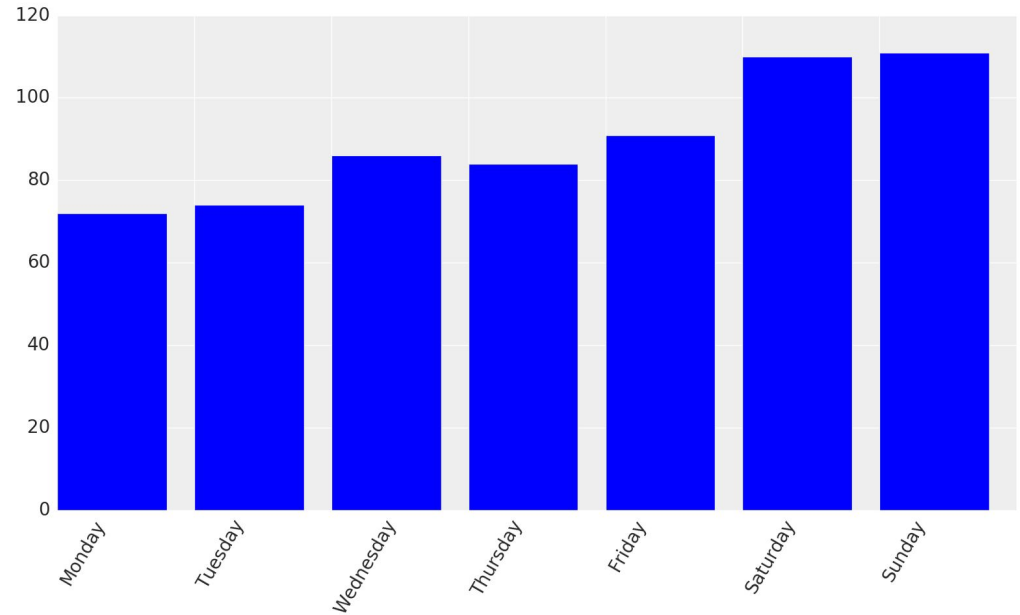**The following figure shows the number of times that each crime is reported, aggregated over all months of 2018..**
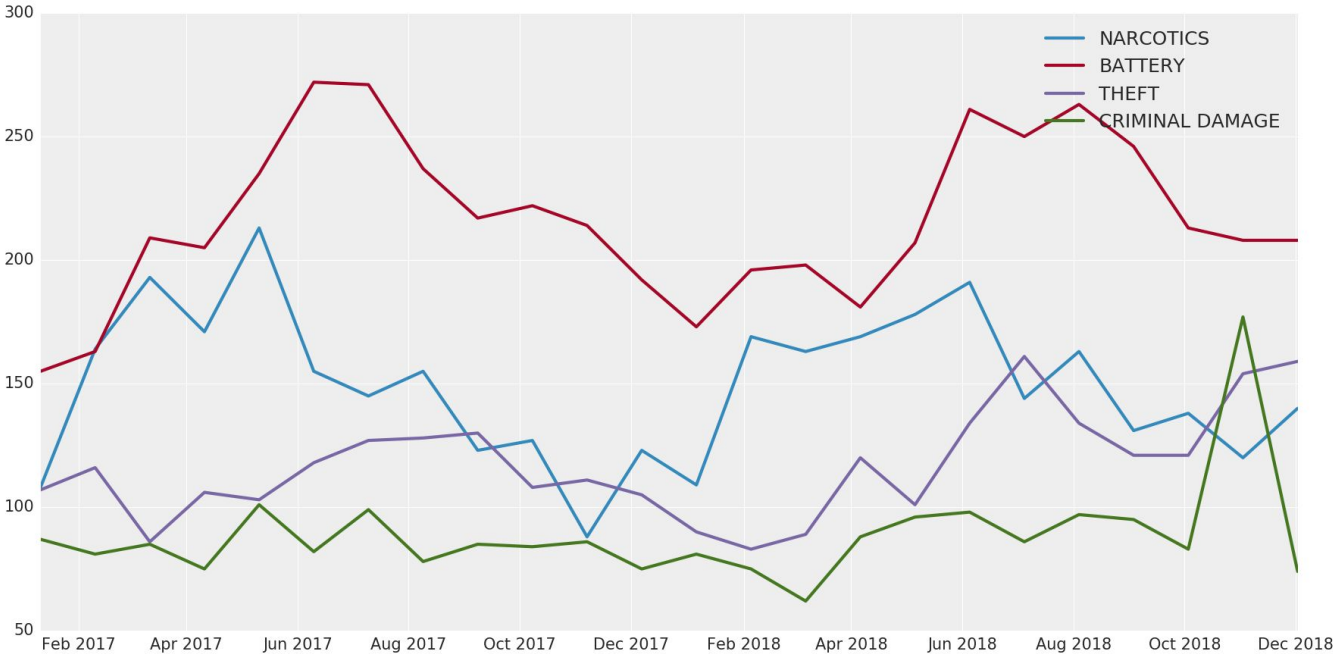
Crime in Garfield Streets
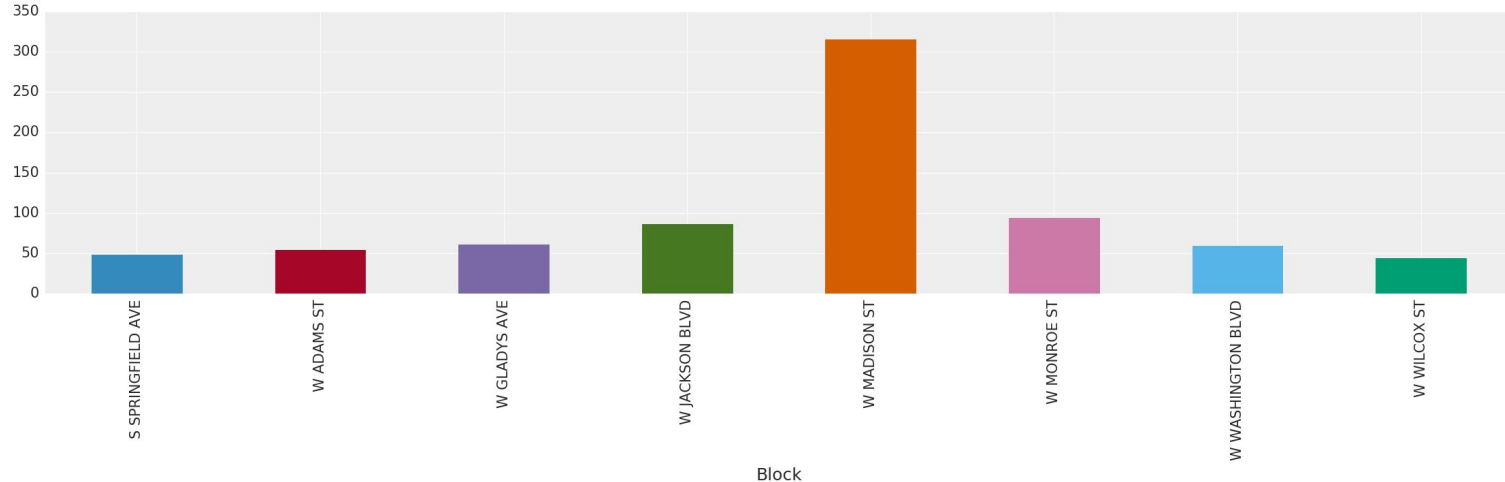
The most crime-frequent streets of West Garfield Park.

Robberies on Weekdays

Number of times Robbery is reported on each day of week over a whole year (2018) in West Garfield Park.
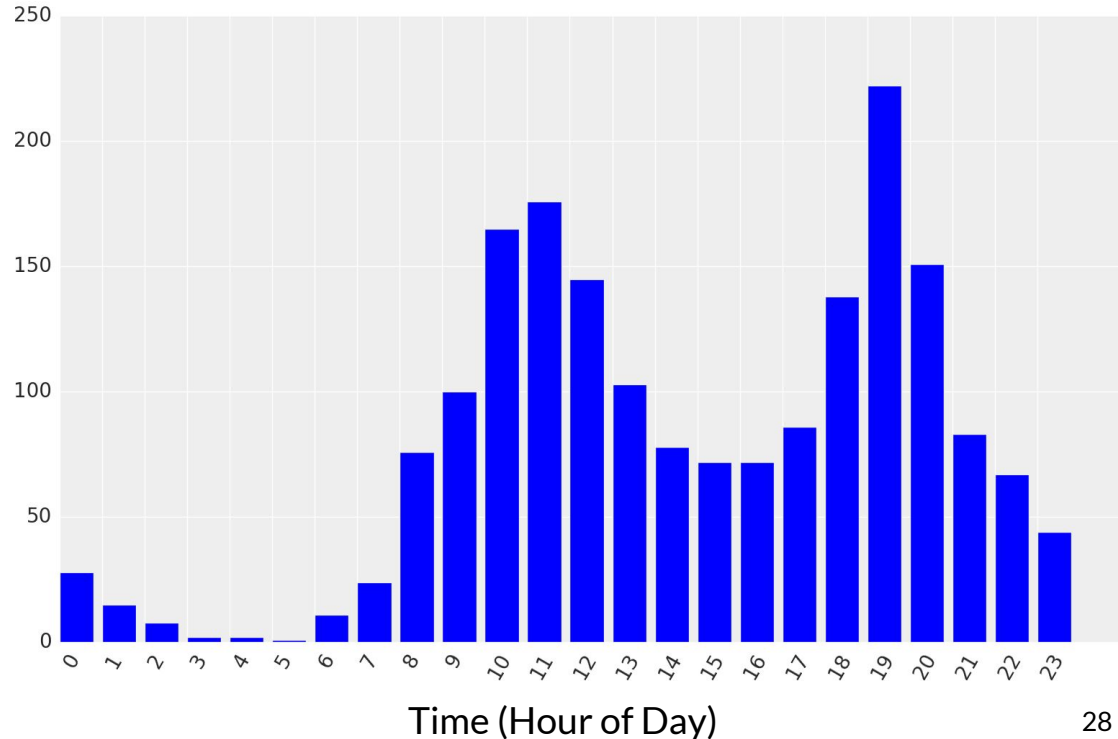
Narcotics in Streets of West Garfield Park

Streets in West Garfield Park where Narcotics incidents are reported most frequently.

Narcotics Incidents in West Garfield Park Based on Hour of the Day

Based on the results, Narcotics are more frequent around noon and late evening, and very rare in early mornings.

Time (Hour of Day)

Our Platform (Conclusion)

- **The main goals of this platform are to:**
  a. **Provide customizable periodic notifications on arbitrary issues: informing members of a particular neighborhood about the problems they would like to be informed about.**
  b. **Allow them to gain insights from publicly available data about various aspects and issues of their neighborhood.**
- **As a solution, we propose a service on the web and a client mobile app that increases awareness among citizens of a city.**

References

[1] City of Chicago: Open Data Executive Order (No. 2012-2)
https://www.chicago.gov/city/en/narr/foia/open_data_executiveorder.html

[2] Patent US20160328810A1: Systems and methods for communications regarding a management and scoring tool and search platform

[3] OpenGrid https://opengrid.io/

[4] Chicago Data portal https://data.cityofchicago.org/

[5] 311 Service Requests http://311request.cityofchicago.org/

[6] NextDoor https://nextdoor.com/

[7] Neighborhood Scout https://www.neighborhoodscout.com/

[8] UChicago Urban Labs https://urbanlabs.uchicago.edu/