

Localization and value creation

Table of Contents

1. Localization brings interesting new dimensions	1
a. Example - Facebook Local Awareness Feature	1
b. Example - Placemeter	2
c. Example - Data @GrandLyon	3
2. The visual power of maps	3
a. Map: useful metaphors with a political dimension	3
b. Example: how to explore the real estate market in the Netherlands	4
c. Key resources to work with maps	4
3. How to represent “space” in data format?	5
a. The specificity of geospatial data	5
b. Solutions to store and retrieve geospatial data	6
4. Two friends for localization: personalization and real-time	7
5. Ending with a provocation: Challenging the usefulness of location	8
a. Localization is about people and <i>territories</i>	8
b. Distributed systems – the end of territories?	9
The end	9



1. Localization brings interesting new dimensions

Localization relates activities to physical space, in at least 4 different ways:

Place: Where is this activity happening?

Distance: Are these two agents neighbors?

Movement: Is this agent travelling?

(together with **speed** and **acceleration**)

Structure: How are these agents and activities **configured** in space?

a. Example - Facebook Local Awareness Feature

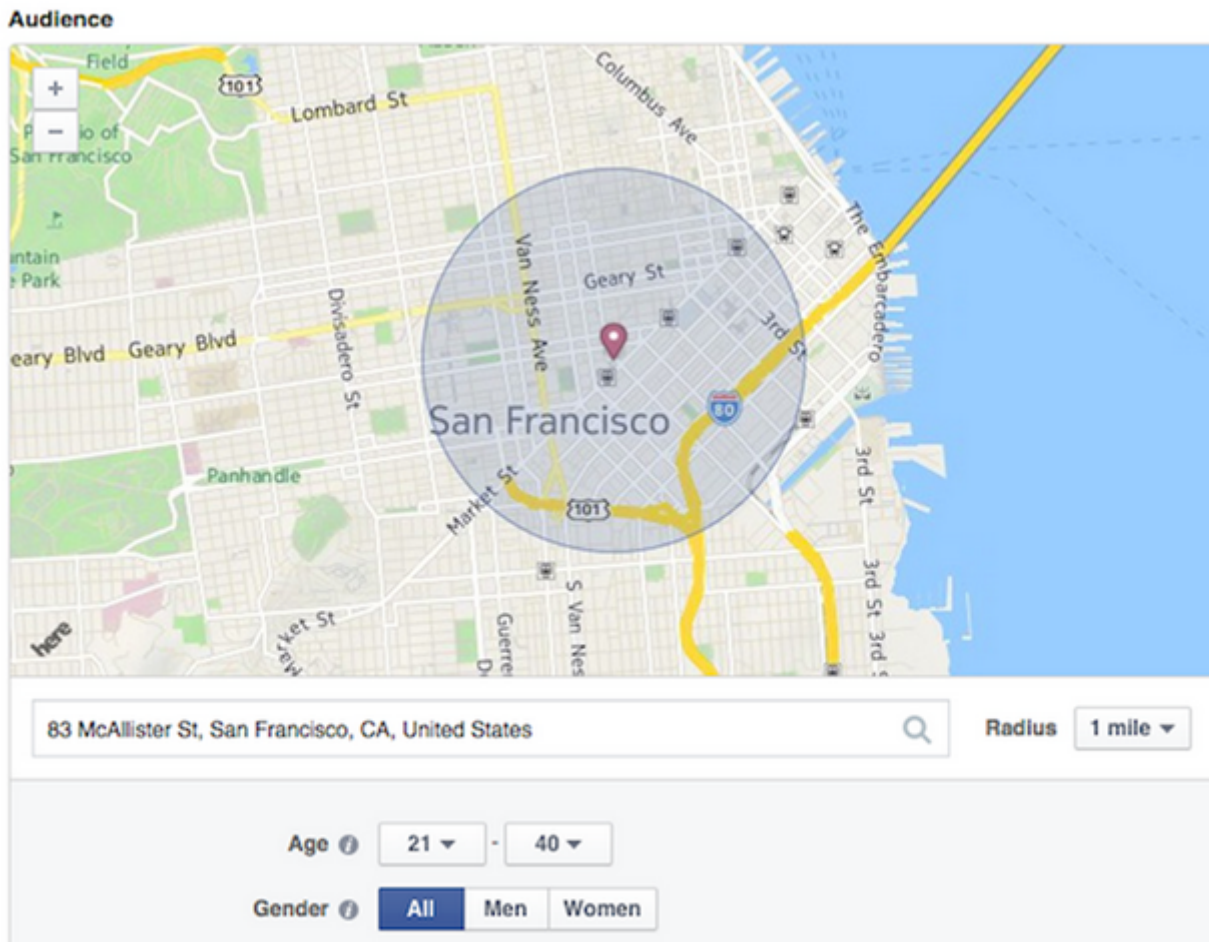


Figure 1. Facebook Local Awareness Ad Feature

“Helping Local Businesses Reach More Customers”:

- Target ads to people living in a radius around your store.
- Can also target people who have been recently in this radius.

→ <https://www.facebook.com/business/learn/facebook-create-ad-reach-ads>

► <https://www.youtube.com/watch?v=-YE90ygsw0U> (YouTube video)

b. Example - Placemeter



Figure 2. Placemeter analyzes pedestrian traffic through video

“Using computer vision to analyze real life activity”:

- Cameras placed in public places (possibly at the windows of private households)
- Video is treated on the device attached to the camera, not saved.
- measures pedestrian traffic in front of stores to provide "main street analytics"

→ <https://www.placemeter.com/>

► <https://www.youtube.com/watch?v=irydHrRdpkY> (YouTube video)

c. Example - Data @GrandLyon

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An initiative by the city of Lyon

- Making data open to foster innovation for citizens and businesses
- Includes many datasets with geographical relevance

Similar initiatives in large cities:

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<a href="https://data.amsterdam.nl/">[amsterdam</a>] <a
href="https://www.beijingcitylab.com/">"
width="112.5" tmp="false">] <a href="http://www.milanosmartcity.org/joomla/">" width="112.5" tmp="false">] <a
href="http://smartcity.jakarta.go.id/">"
width="112.5" tmp="false">] <a href="http://smartcityinnovationlab.com/">" width="112.5" tmp="false">]
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2. The visual power of maps

a. Map: useful metaphors with a political dimension

- The visual metaphor of the map is widely understood
- Makes exploration easy: all visible at once, while zoom allows for details as well
- Multiple information cues (colors, symbols, shapes, layers, etc.)
- Keep in mind: maps are always **political**
- Watch this extract from the TV series "The West Wing", Season 2, Episode 16:

► <https://www.youtube.com/watch?v=vVX-PrBRtTY> (YouTube video)

b. Example: how to explore the real estate market in the Netherlands

- Every single building of the Netherlands on a map
- Colored by year of construction
- With role (retail or housing?) and surface highlighted
- Zoomable and draggable

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c. Key resources to work with maps



Figure 3. Stamen Design

- Agency based in San Francisco
- Famous for cutting research in map design



Figure 4. MapBox

- Mapbox.com
- SaaS to create interactive maps in web pages and mobile apps.



Figure 5. Openstreetmap

- OpenStreetMap
- A crowd sourced open source map of the world. Available through API.

3. How to represent “space” in data format?

a. The specificity of geospatial data

Data is traditionally stored in tables in relational databases, taking this form:

Customer	Address
Customer 1	67 Pelikaanstraat, Leiden 2314 CR
Customer 2	12 Breestraat, Rotterdam 3046 DM

Figure 6. A table with two entries

A table can have millions of rows. How to retrieve information such as "get all customers living in Rotterdam"?

"SQL" (Structured Query Language) is a system to express these kinds of queries.

In the table shown above, a query written in SQL look in the "Address" column and inspect all the text to find if "Rotterdam" is present or not.

This is highly inefficient (slow), and more complex queries would not work.

For example, the table above could not be queried for "get all customers living in a 10 miles radius around Rotterdam".

So how to store geospatial data in a way that makes it easy to retrieve?

b. Solutions to store and retrieve geospatial data

1. SQL solutions

Even if SQL does not perform well on geospatial data "out of the box", extra modules have been developed to deal with it.

Microsoft SQL server since 2008:

- Possible to store and query “geometric” and “geographic” objects
- Possible to use complex queries on these objects

2. NoSQL solutions

Since ~ 2005, new types of databases have been developed, which don't follow a table structure in order to facilitate the query of special kinds of data, like geospatial data or network data.

These new databases are called "NoSQL databases"

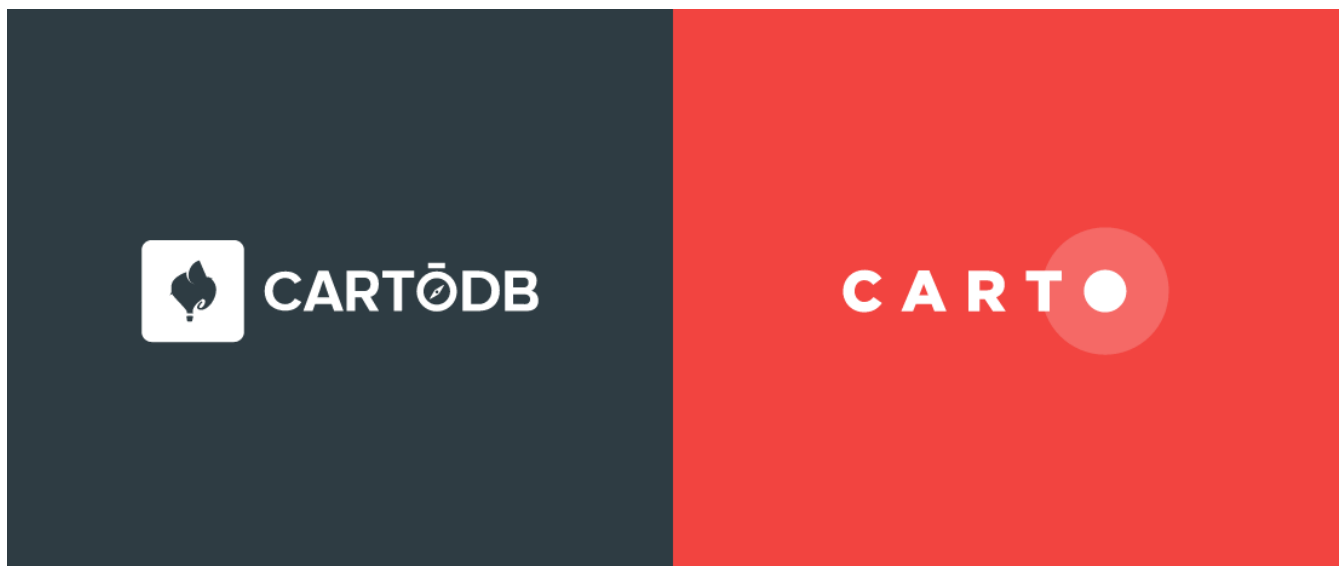


Figure 7. the Carto Platform

[Carto \(ex CartoDB\)](#): specializing in geospatial data + mapping.



Figure 8. Neo4J, a database for networks

[Neo4J Spatial](#) enables to mix the logics of networks with places in the data, so that you can make such queries on your data:

"Select all streets in the Municipality of NYC where at least 2 of my friends are walking right now."



Figure 9. GeoJSON and TopoJSON are derivations of the json formats for geospatial data

GeoJSON and TopoJSON: 2 data formats to represent geometric and geographic data developed for Javascript applications – and beyond.

4. Two friends for localization: personalization and real-time

Knowing the person, its location, at a precise time unlocks meaningful push notifications

Push notifications are these alerts sent by an app on your mobile, visible as transient icons.

Gets “push marketing” back on solid foundations:

Push marketing actions only to the right person, at the right place, at the right time (and at the right frequency!)

5. Ending with a provocation: Challenging the usefulness of location

a. Localization is about people and *territories*

- Data is a fungible and universal material (just 0s and 1s)
- Geographical coordinates are perfectly universal (just need a longitude and latitude)

and yet ...

The logic of territories is shaping data: there is a geography of data.

Cultural, social, political, linguistic, economic dimensions to data.

→ representations with a supposedly universal and transparent coordinate system blinds us to this fact.

This argument is made by Frederic Martel in his book "Smart": Internet does not flatten everything into one big model. There are several Internets with their geography, politics and sociology.

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- Data protection: [not all countries are equal](#)
- Data handling devices

India and Africa have ++ share of mobile devices

- Data production

Amazon Mechanical Turk is a service of data production through the hiring of a distributed crowd of workers. Tends to "erase distance".

Yet, the geographical distribution of workers on Amazon Mechanical Turk is far from even. The following figure is taken [from this study](#):



Figure 1: The number of workers per country. This map was generated based on geolocating the IP address of 4,983 workers in our study. Omitted are 60 workers who were located in more than one country during the study, and 238 workers who could not be geolocated. The size of the circles represents the number of workers from each country. The two largest are India (1,998 workers) and the United States (866). To calibrate the sizes: the Philippines has 142 workers, Egypt has 25, Russia has 10, and Sri Lanka has 4.

Figure 10. Distribution of Amazon Mechanical Turk workers

b. Distributed systems – the end of territories?

The libertarian dream of the cypher-punks: individuals transact without consideration for their nationality, currency, legal system, political regime.

Organizations, banking, voting systems, ... any aggregated human activity could emerge without reference to local territories or institutions. Just groups of individuals transacting voluntarily and securely, without a notion of place or distance.

- Bitcoin: the currency for these transactions?
- Torrent: The exchange platform for numeric goods?
- Ethereum: the platform where contracts are made and executed?

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The end

Find references for this lesson, and other lessons, [here](#).



This course is made by Clement Levallois.

Discover my other courses in data / tech for business: <http://www.clementlevallois.net>

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