Mass Appraisal and Big Data (Thinking)

'Process over Petabytes'

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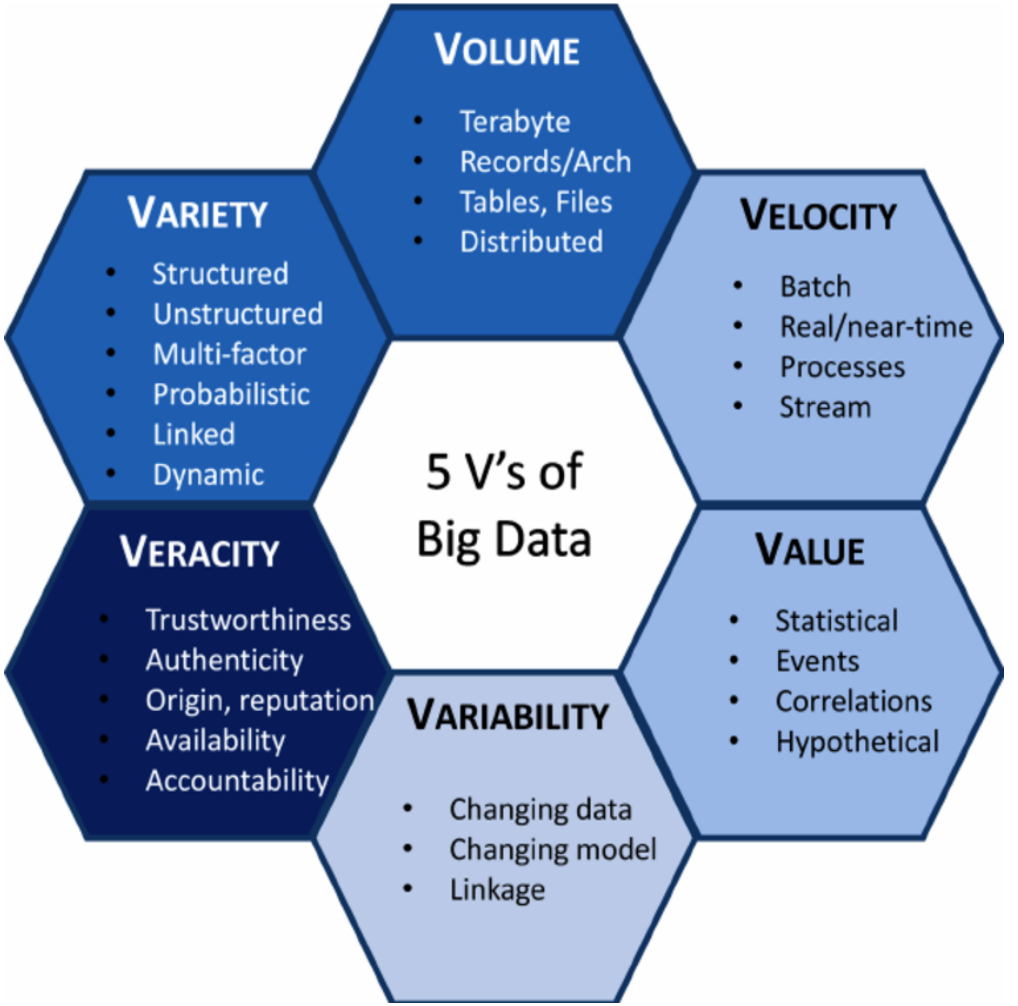


source: Moura and Serrao, 2015

My Background

Greenfield Advisors

Zillow®

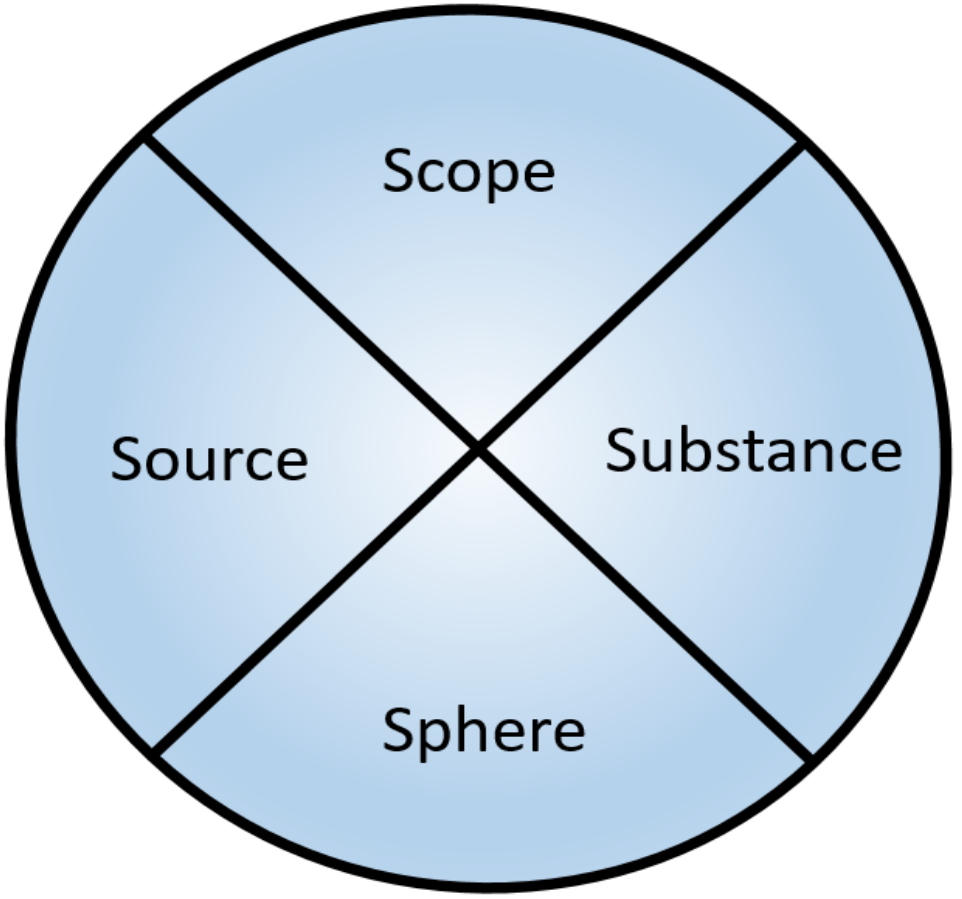
THE UNIVERSITY OF MELBOURNE

Big Data as a Mentality or Process

Big Data as a Mentality or Process

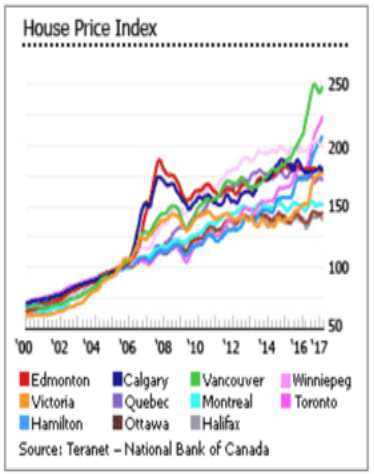
- What *other* data can be used?
- What additional data could be generated by this process?
- How do I measure if this is any good?
- Is this transparent and repeatable?

Four S's of Meta-data

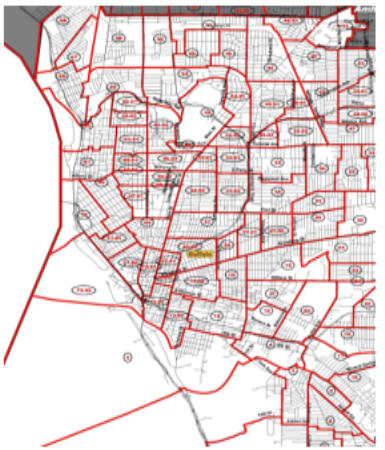


Data Scope

Specific



Intentional



Collateral

OpenStreetMap

Three other Ss

1. **Substance**: What does the data tell us about?
    - Economic
    - Physical
    - Spatial/Temporal
    - Human
2. **Sphere**: What is what the data tells us about?
    - Public Good
    - Private Entity
3. **Source**: Who created and owns the data?
    - Public
    - Private

Creating Data

Creating Data

1. Without measurement improvement is difficult

2. Learning about your own processes

3. Automate systems

4. Logging activities

Is this any good?

Is this any good?

(Doesn't have to be the results!)

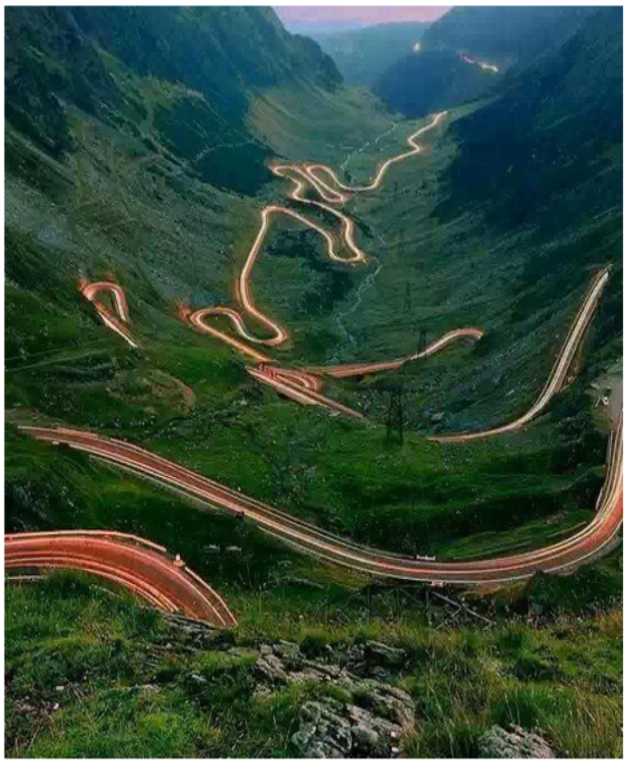
1. Speed of completion

2. Number of complaints

3. Usefulness of expenditures

4. Think about A/B testing

Reproducibility and Transparency



Reproducibility and Transparency

Transparency and Reproducibility

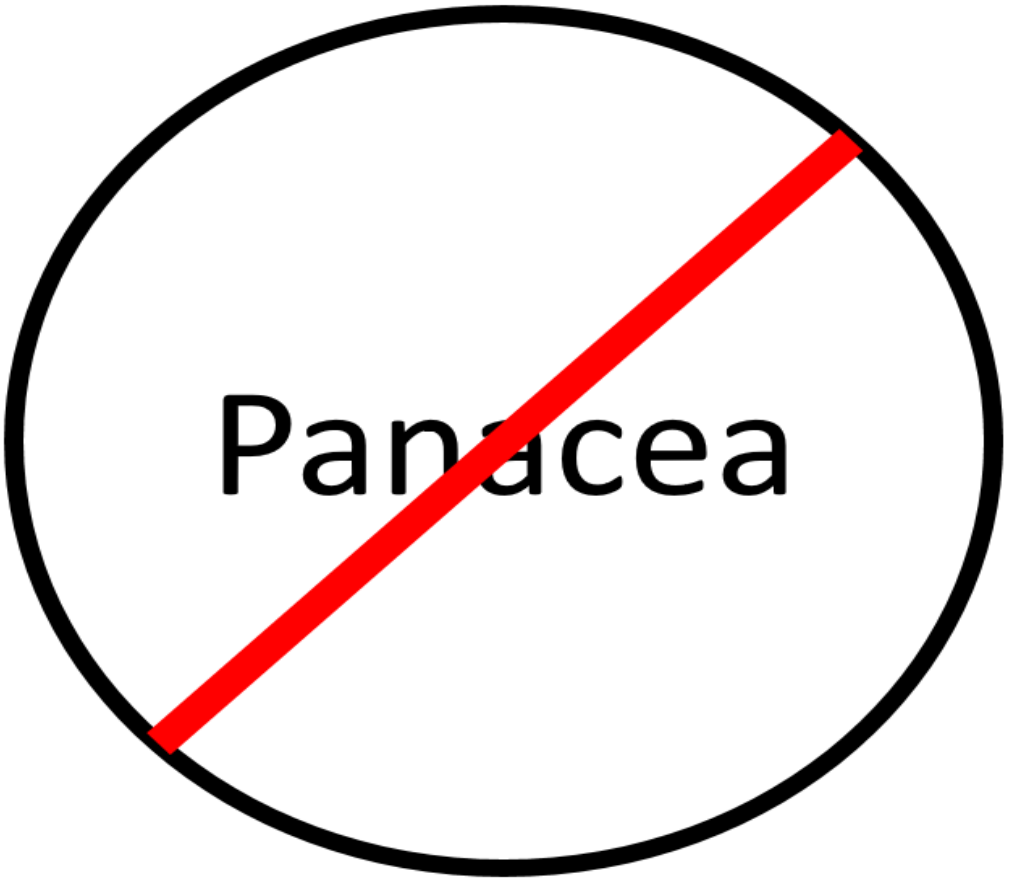
1. Focus on Process to Pipeline
    - Standardization

2. Reproducibility:
    - Efficiency
    - Collaboration
    - Expertise

3. Code, Code, Code
    - No manual analyses

4. Understanding your Data
    - Strengths and Weaknesses

Big Data (Thinking)



Big Data (Thinking)

Verification

- Is this process working as planned?

vs.

Validation

- Is this the right solution for the problem?

Source: Max Tegmark - 'Life 3.0'.

What does this mean for Valuation?

1. Short Term:
    - Better micro-spatial analysis and adjustment
        - Includes changing land values due to changing consumer patterns
    - Faster re-valuations (more time for difficult properties)
    - General efficiency and operational cost savings
    - Measure website activity to anticipate value challenges
2. Medium term:
    - Coalating data from MLS/aggregators
    - Image Recognition
        - (MLAS) Maching Learning as a Service
    - Drone tech for analyzing view quality / changes to properties
3. Long term:
    - Parsing values from Sustainability / Management
    - Crowd-sourcing valuation input
        - More informed property owners? Good or bad?

Case Study

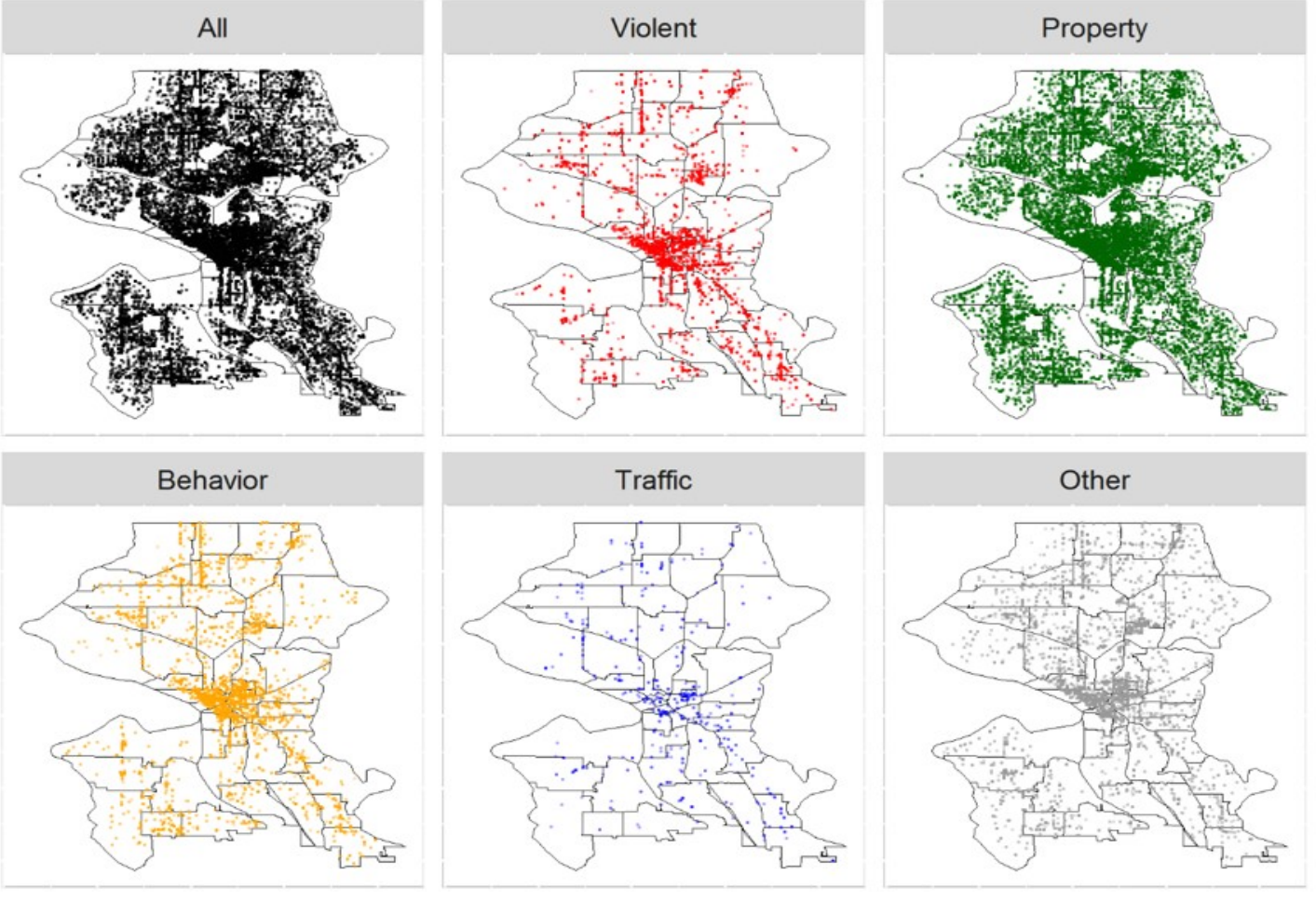
1. Use of Twitter data to inform valuation models in Seattle, WA USA

2. Crime tweets and price appreciation

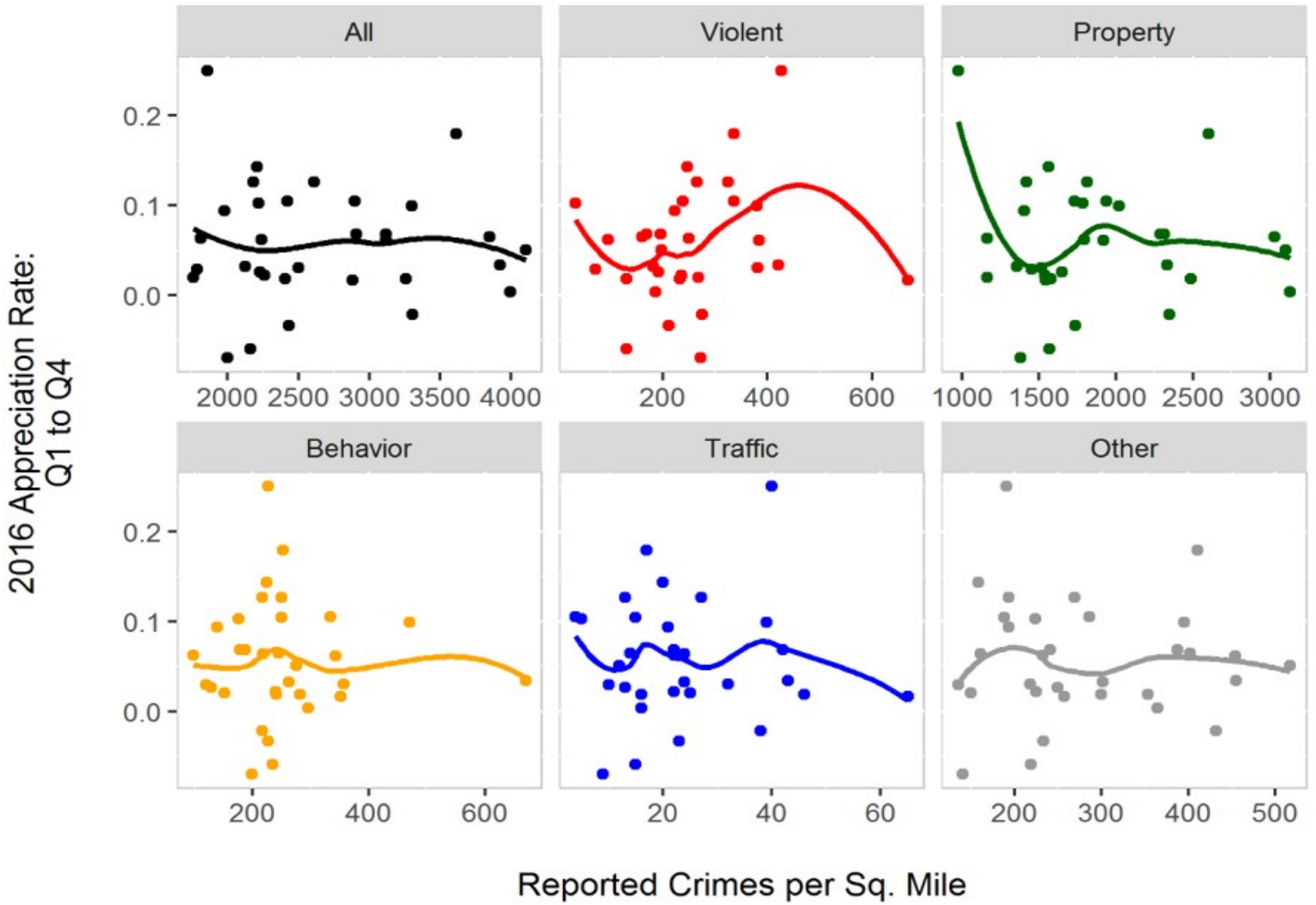
3. Citizen sentiment and price appreciation

4. "Toy example"

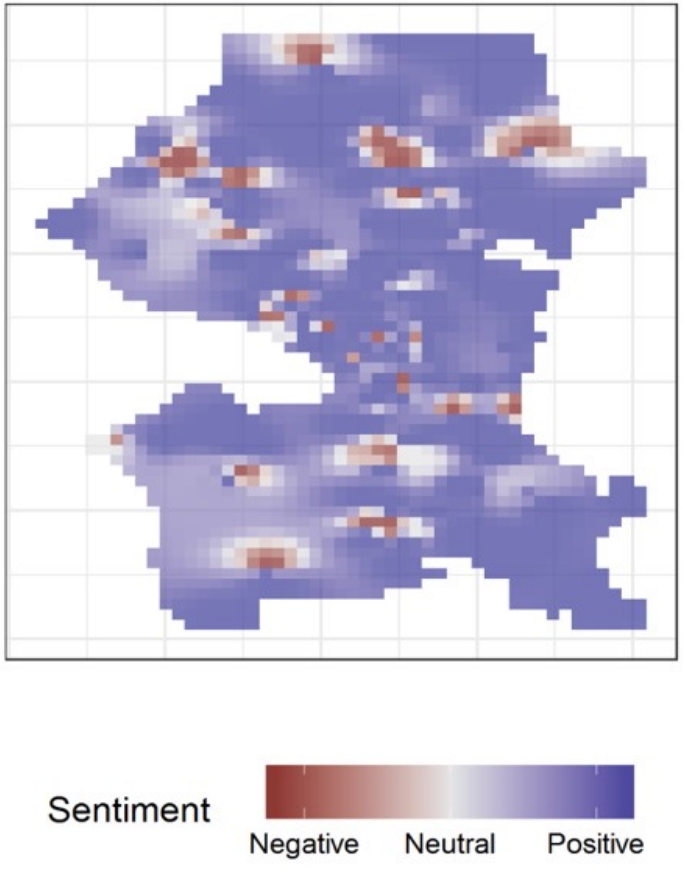
Case Study



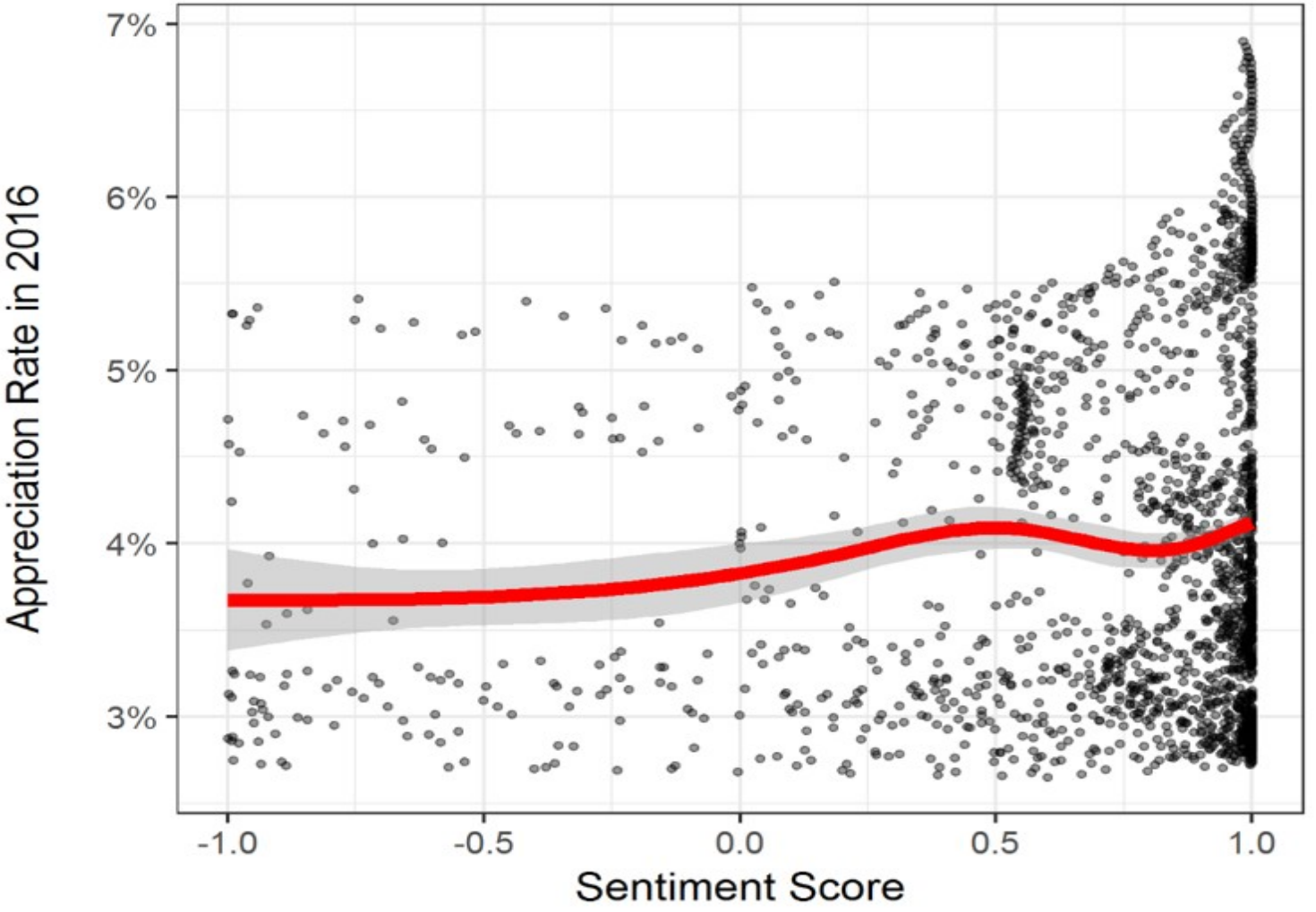
Case Study


All
Violent
Property
Behavior
Traffic
Other
2016 Appreciation Rate: Q1 to Q4
0.2
0.1
0.0
2000 2500 3000 3500 4000
200 400 600
1000 1500 2000 2500 3000
200 400 600
20 40 60
200 300 400 500
Reported Crimes per Sq. Mile

Case Study



Case Study


Appreciation Rate in 2016
7%
6%
5%
4%
3%
-1.0
-0.5
0.0
0.5
1.0
Sentiment Score

Summary

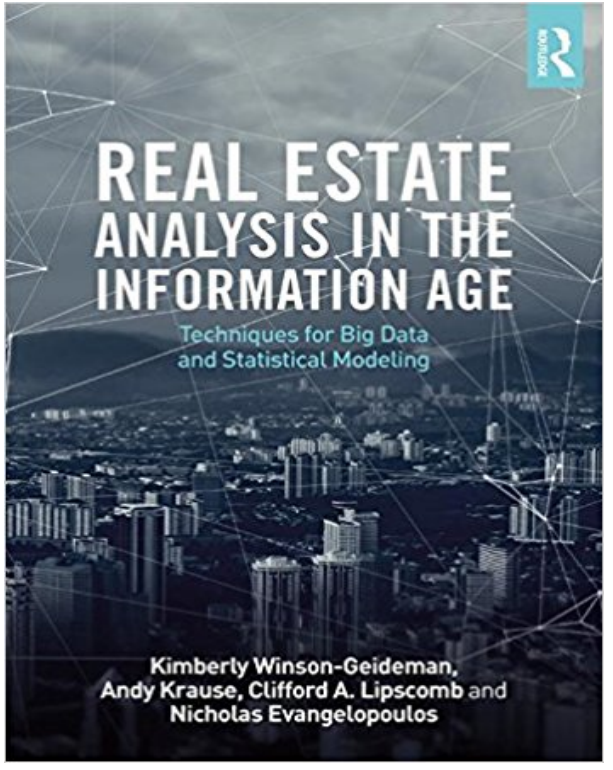
1. Big Data as a mind set

2. New data (ext. & int.), measure, transparent & reproducible

3. Leverage current data and tech

4. Best prepare for future trends

More Resources



https://www.amazon.com/Real-Estate-Analysis-Information-Age/dp/1138232904

https://www.github.com/REAIABook/REAIABook

Thank You!

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