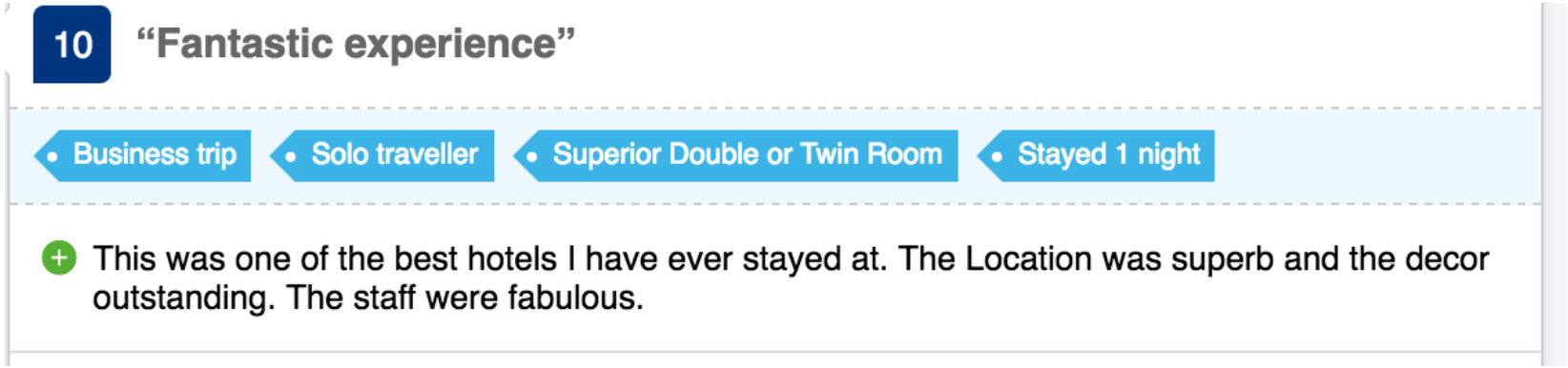

Optimized Hotel Booking
Analyzing Hotel Reviews over Booking.com
kaggle
Booking.com
yelp
Google Maps

SO, WHERE WERE WE?

Booking.com

Around ~1.4K hotels in Europe

Over ½ Million Reviews



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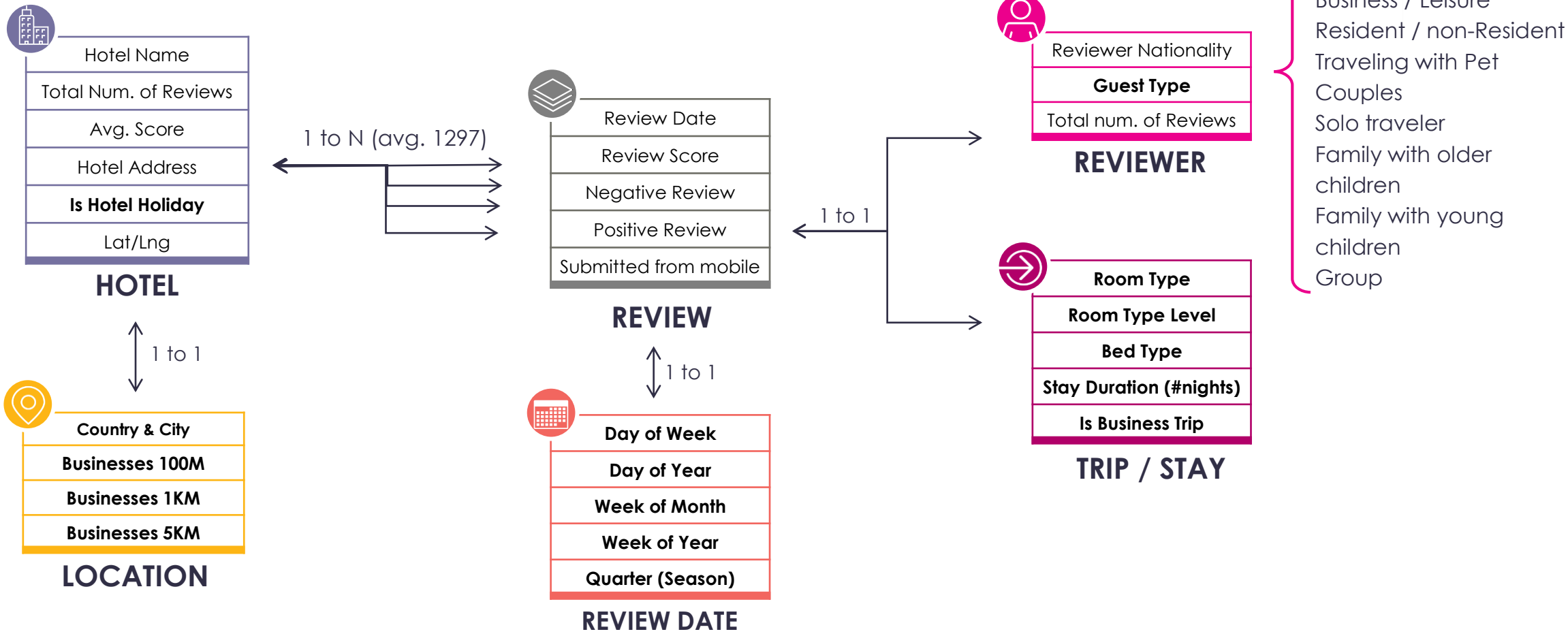
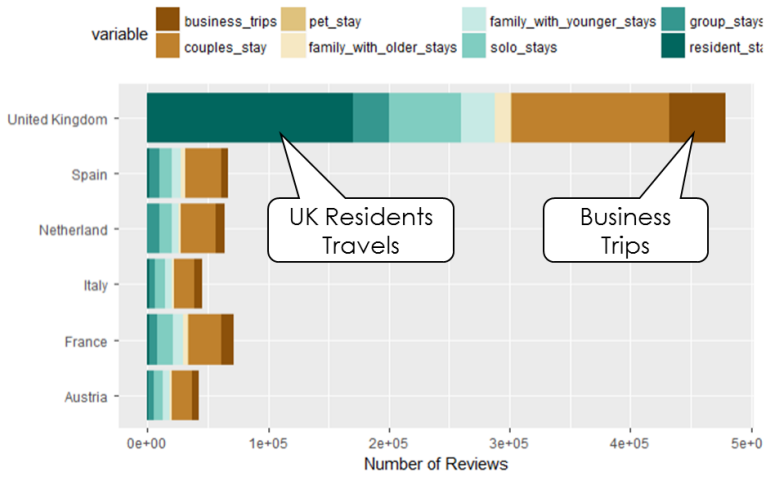
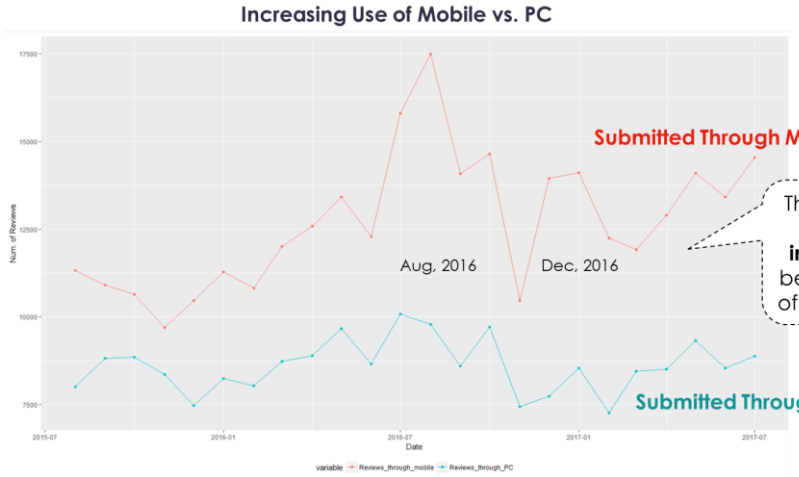
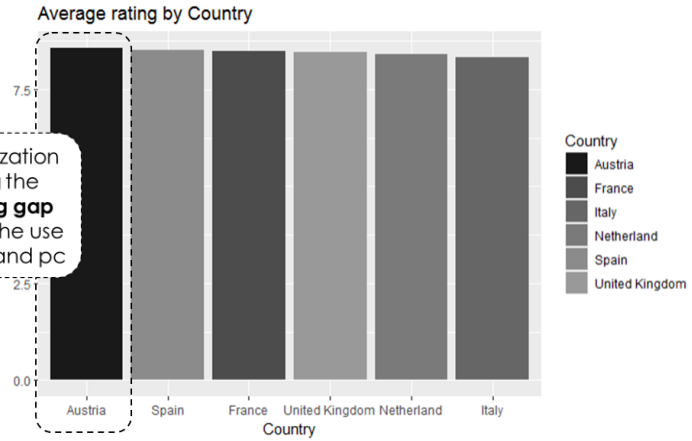


EDA IN ACTION

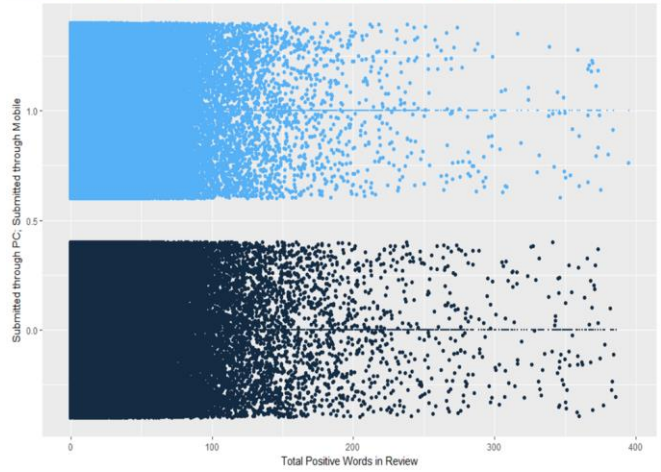




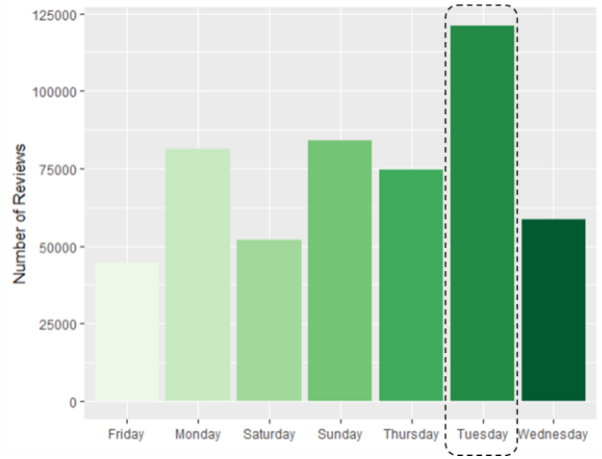
The visualization showing the **increasing gap** between the use of mobile and pc



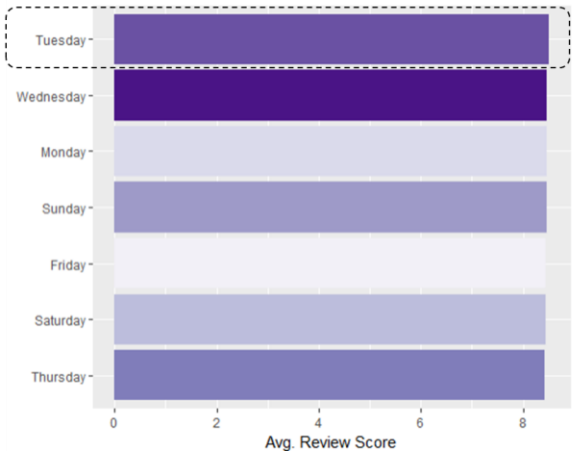
Slight Less Use of words for Positive reviews **Through Mobile**



Tuesday is the Most Popular day to submit a review



...Its also the day the review will be **most positive**



CLUSTERING

CLUSTERING. **BUSINESS GOAL**

Increase Customer Engagement

COMPETITION:

KAYAK

Expedia

tripadvisor

travelocity

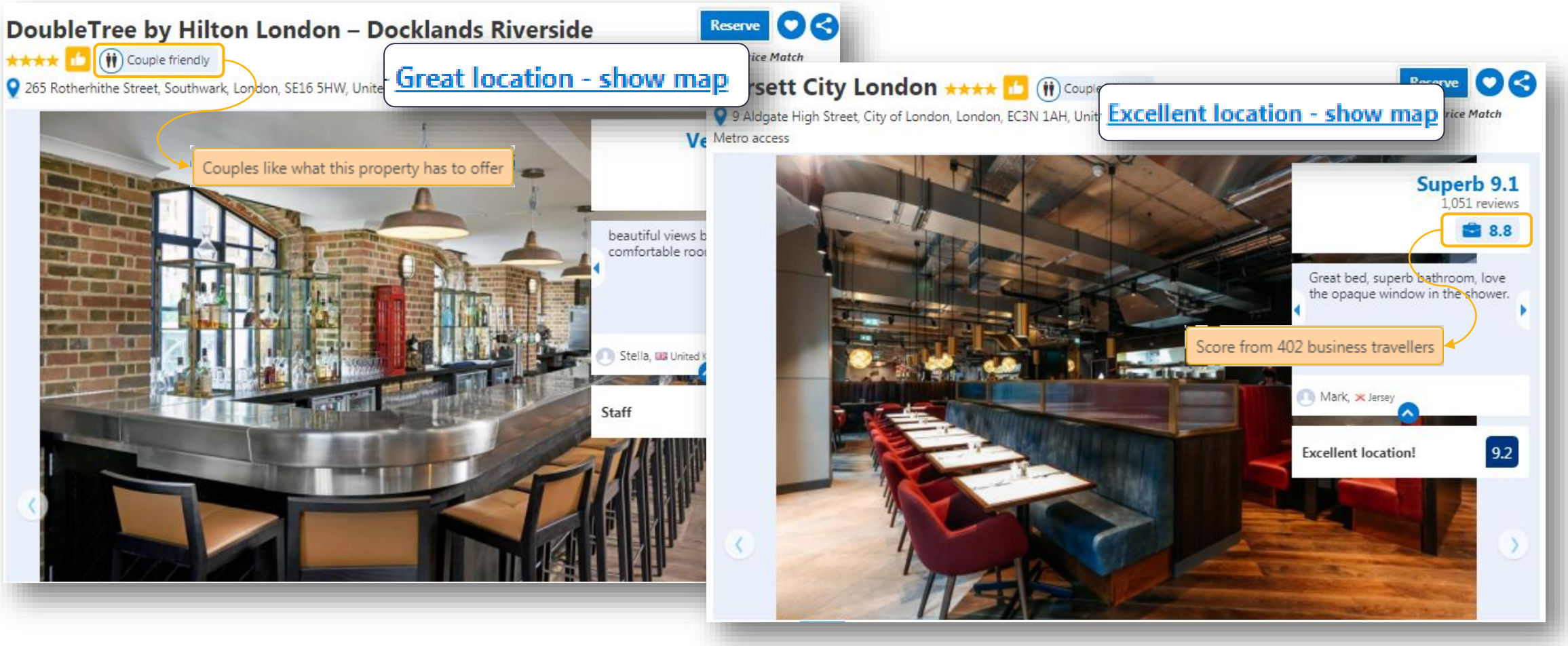
Hotels.com

TRUST

Relevance & Correctness

CLUSTERING. **BUSINESS PROBLEM**

Automatically assign location tag to the hotel



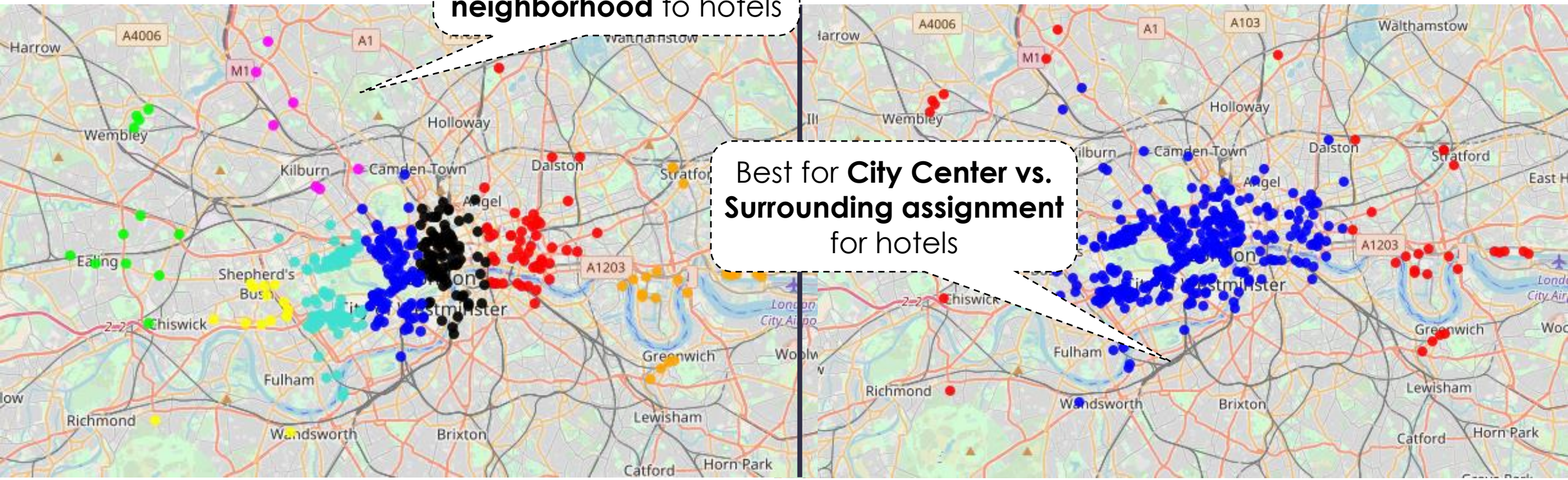
CLUSTERING. **METHODS**

KMEANS

Best for **automated assignment of neighborhood** to hotels

DBSCAN

Best for **City Center vs. Surrounding assignment** for hotels



WHAT ELSE?

BUSINESS INSIDER

TECH FINANCE POLITICS STRATEGY LIFE ALL

Machine learning is driving growth at Airbnb

Stephanie Pandolph

Jun. 16, 2017, 10:43 AM 4,571

FACEBOOK LINKEDIN TWITTER EMAIL PRINT

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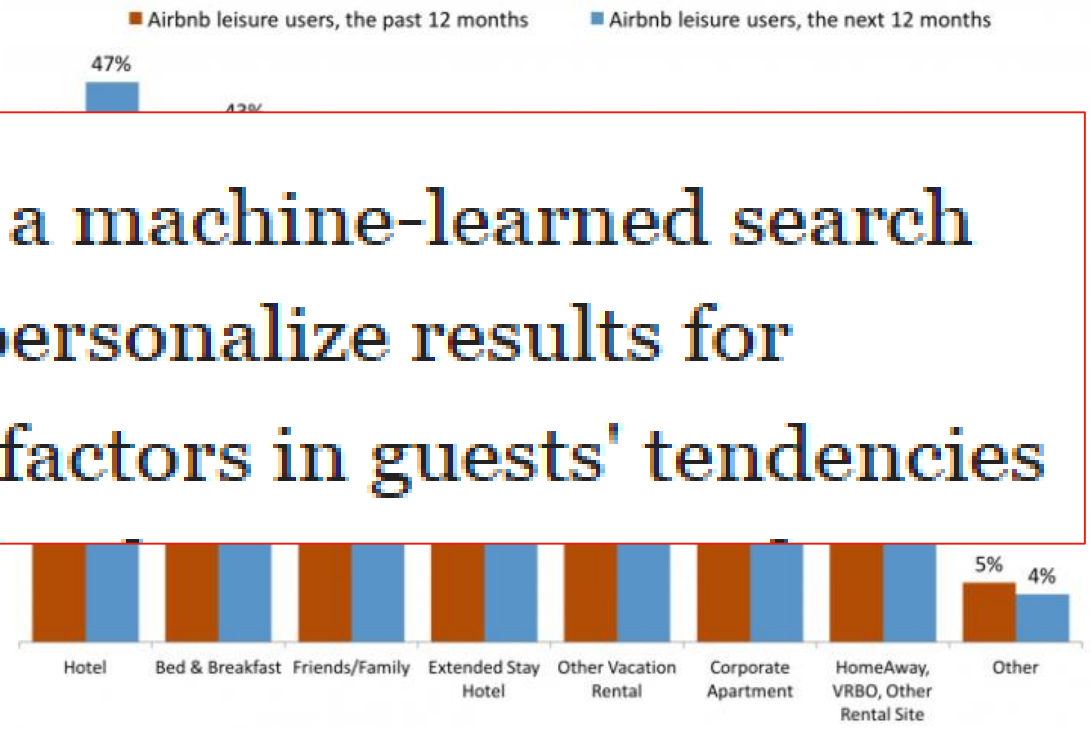
Machine learning (ML) has had a "profound" effect

- The company uses a machine-learned search ranking model to personalize results for guests. The model factors in guests' tendencies

Airbnb might look at whether customers favor specific types of décor in places they book. The company feeds more than 100 characteristics into the model, which then uses the data to identify patterns and personalize search rankings.

Where Global Airbnb Users Are Switching From



Source: Morgan Stanley

BI INTELLIGENCE

BII

CLUSTERING. **BUSINESS CHALLENGE**

Personalize hotel search results / recommendations

Yanir

Kobi

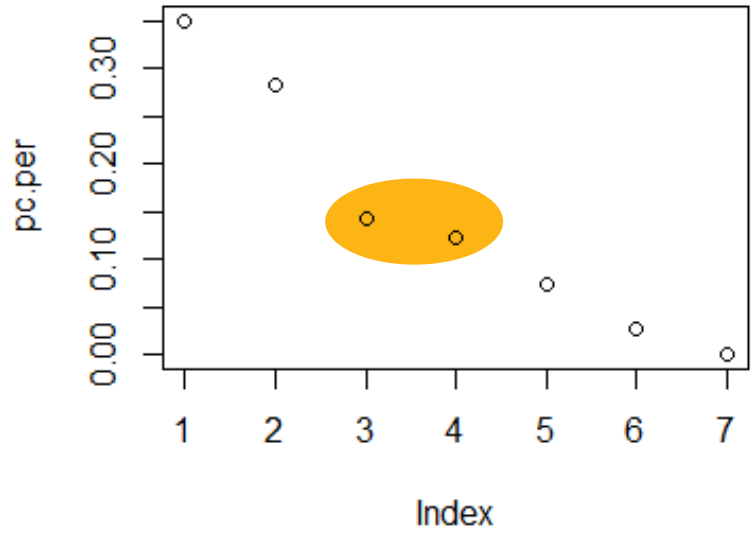
Noa

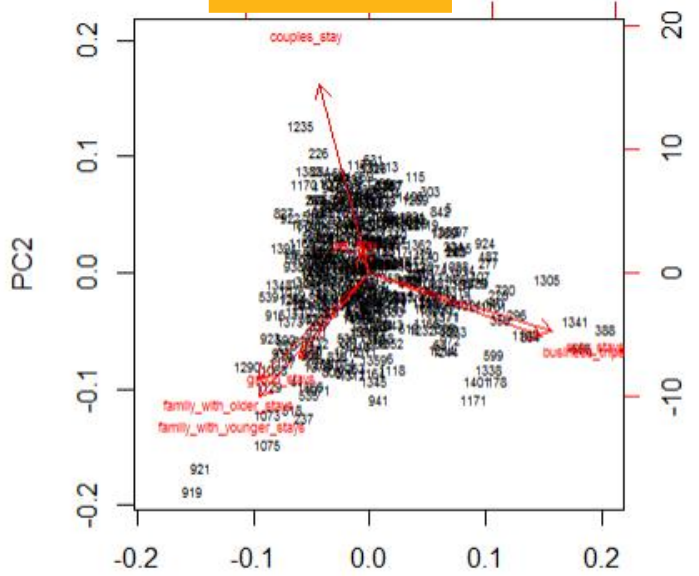
CLUSTERING. **METHODS**

Dimensionality Reduction - PCA

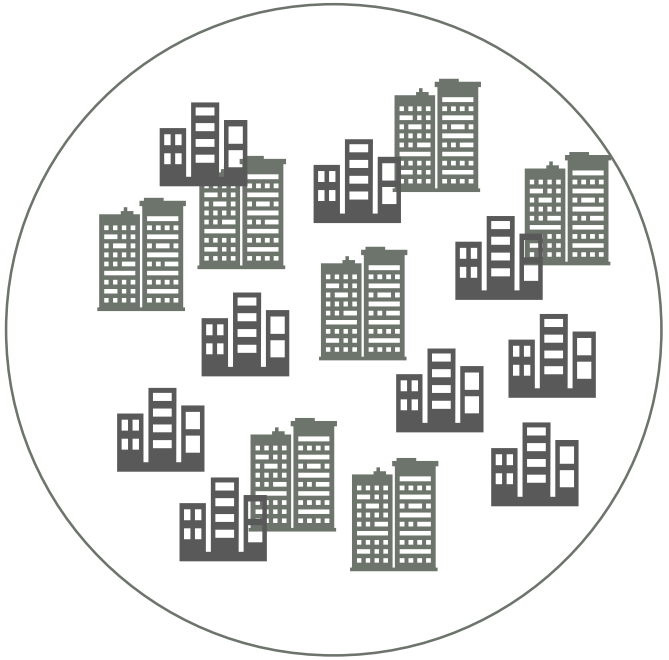
```
Standard deviations (1, .., p=7):
[1] 1.56640718 1.40685881 0.99908959 0.92565552 0.72493386 0.43140421 0.02144696

Rotation (n x k) = (7 x 7):
```

	PC1	PC2	PC3	PC4	PC5	PC6	PC7
business_trips	0.55977527	-0.22907968	-0.06405424	0.08461212	0.05777924	0.78712880	0.001347057
couples_stay	-0.16159414	0.67840677	0.05334131	0.03222923	0.08345737	0.30601295	0.639654996
pet_stay	-0.03539911	0.07769089	-0.98933010	0.06462701	0.08737650	-0.04608224	-0.001449973
family_with_older_stays	-0.36454270	-0.38116160	0.02728986	-0.27986336	0.77503813	0.12345083	0.163804791
family_with_younger_stays	-0.35503287	-0.44382457	-0.10640842	-0.31828719	-0.61029915	0.19299941	0.393227788
solo_stays	0.59072207	-0.21226768	-0.01386827	-0.08819196	0.09234030	-0.48132550	0.598179531
group_stays	-0.22670158	-0.30647822	0.04492096	0.89454869	0.01964406	-0.02230787	0.227065444

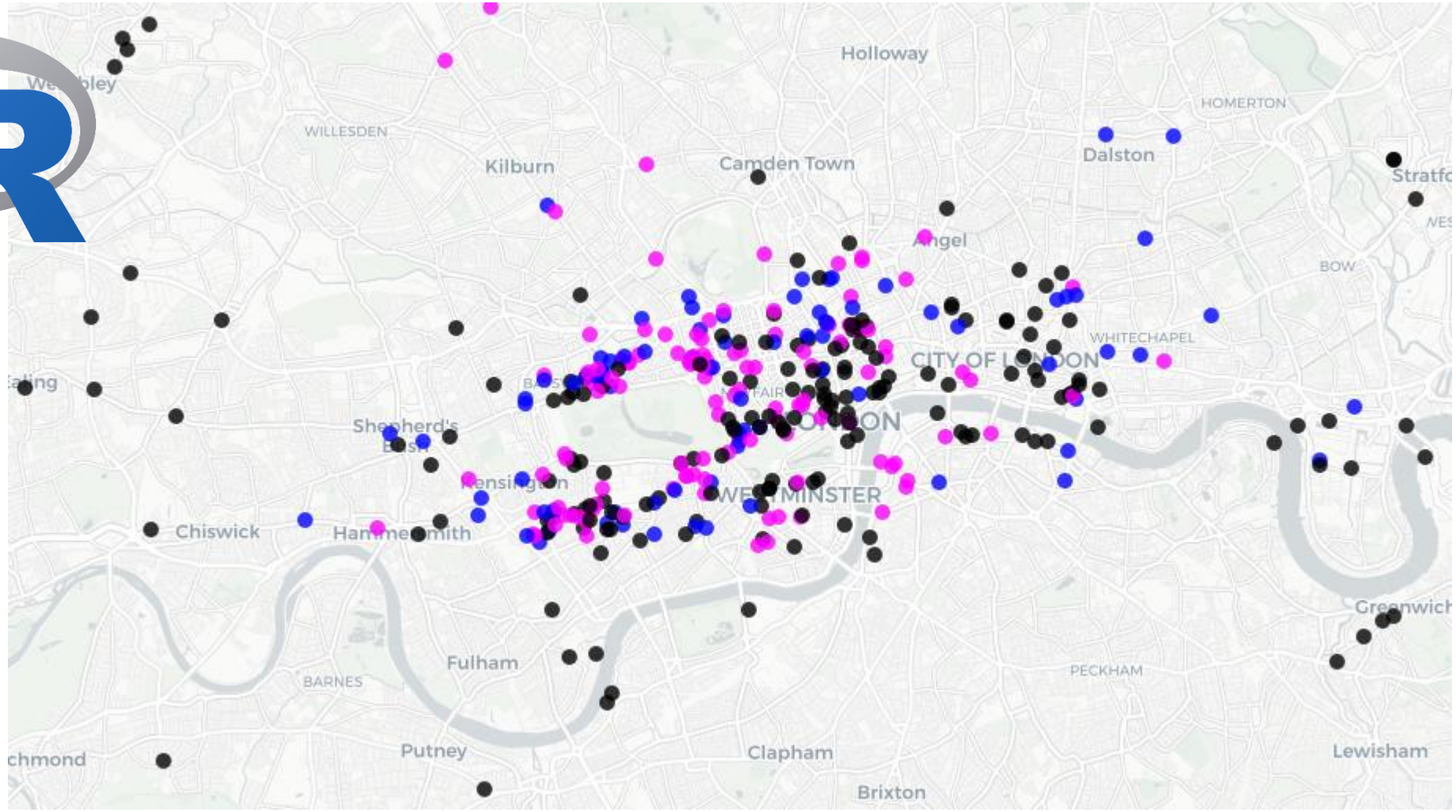




CLUSTERING. **METHOD**



CLUSTERING. **ON MAP**



CLUSTERING. **BUSINESS OBJECTIVES MET**

Which business problems / predictions we could fulfill?

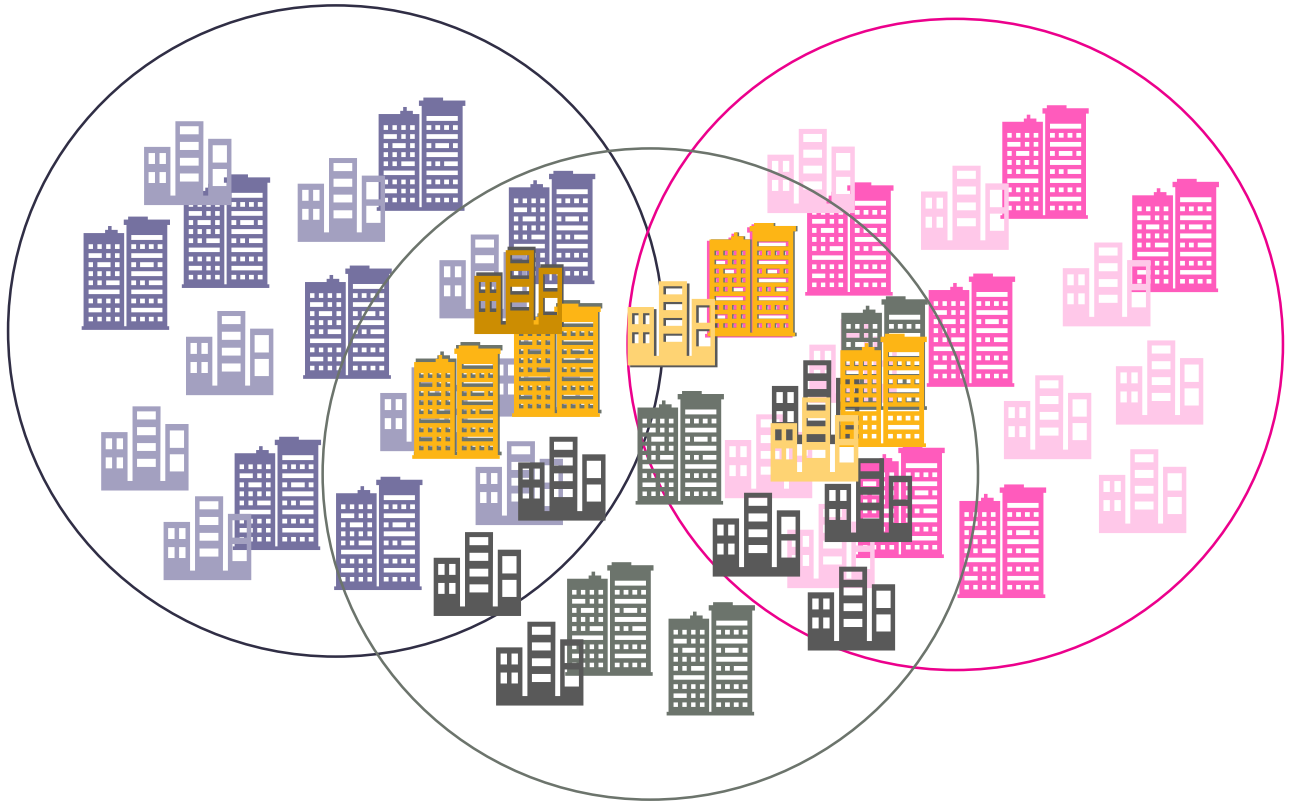
1. Machine Learning model (clustering) to **personalize search results**

2. **Prediction model for Segmentation** correlated to geo-location

3. **Recommendation engine for hotels by proximity** (when one is unavailable)

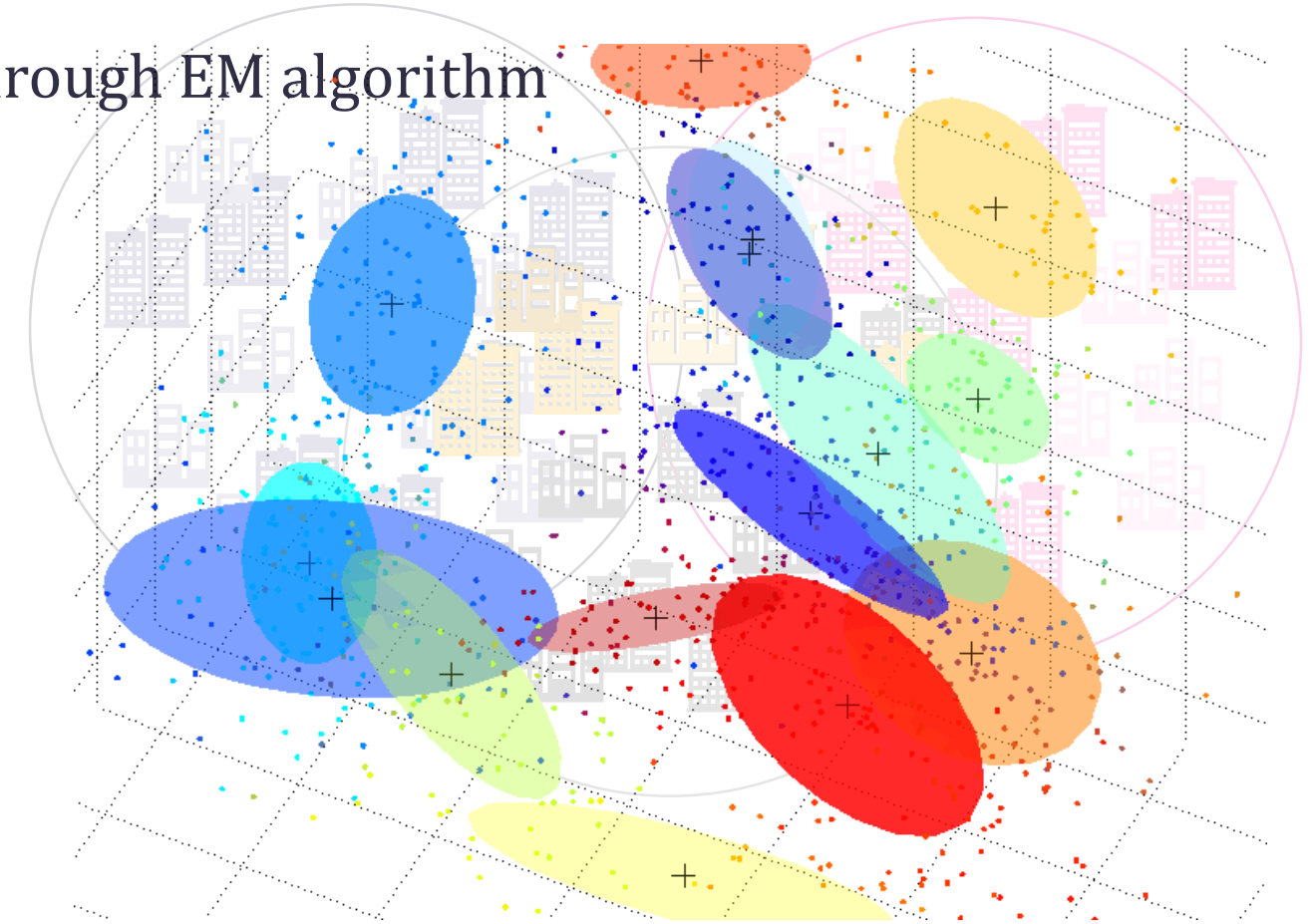
CLUSTERING. **BUSINESS SOLUTION – REVIEW MODEL**

What are we missing with the previous algorithm?



CLUSTERING. **BUSINESS SOLUTION – REVIEW MODEL**

Suggested approach: Maximization of the search results using Gaussian Mixture Model (GMM) through EM algorithm



To Be Continued...