



# 位置智能在零售市场的科学和应用

主讲人：Pitney Bowes首席解决方案架构师 张军

Pitney Bowes产品总监 Sasidhar Perraju Akkiraiu

位置智能在零售市场的科学和应用

# Location Intelligence at the Heart of Retail Marketing

Sasidhar Akkiraju,  
Jun Zhang (张军)

pitney bowes 



# EVOLUTION OF MARKETING





Handwritten text on the left side of the wall.

Handwritten notes and equations in the top left corner.



Handwritten mathematical notes and equations in the top center area.

Handwritten mathematical notes and equations in the top right area.

Handwritten mathematical notes and equations in the middle left area.



Handwritten mathematical notes and equations on the right side of the wall.

Handwritten mathematical notes and equations in the middle bottom area.

Handwritten mathematical notes and equations in the bottom center area.

Handwritten mathematical notes and equations in the bottom right area.



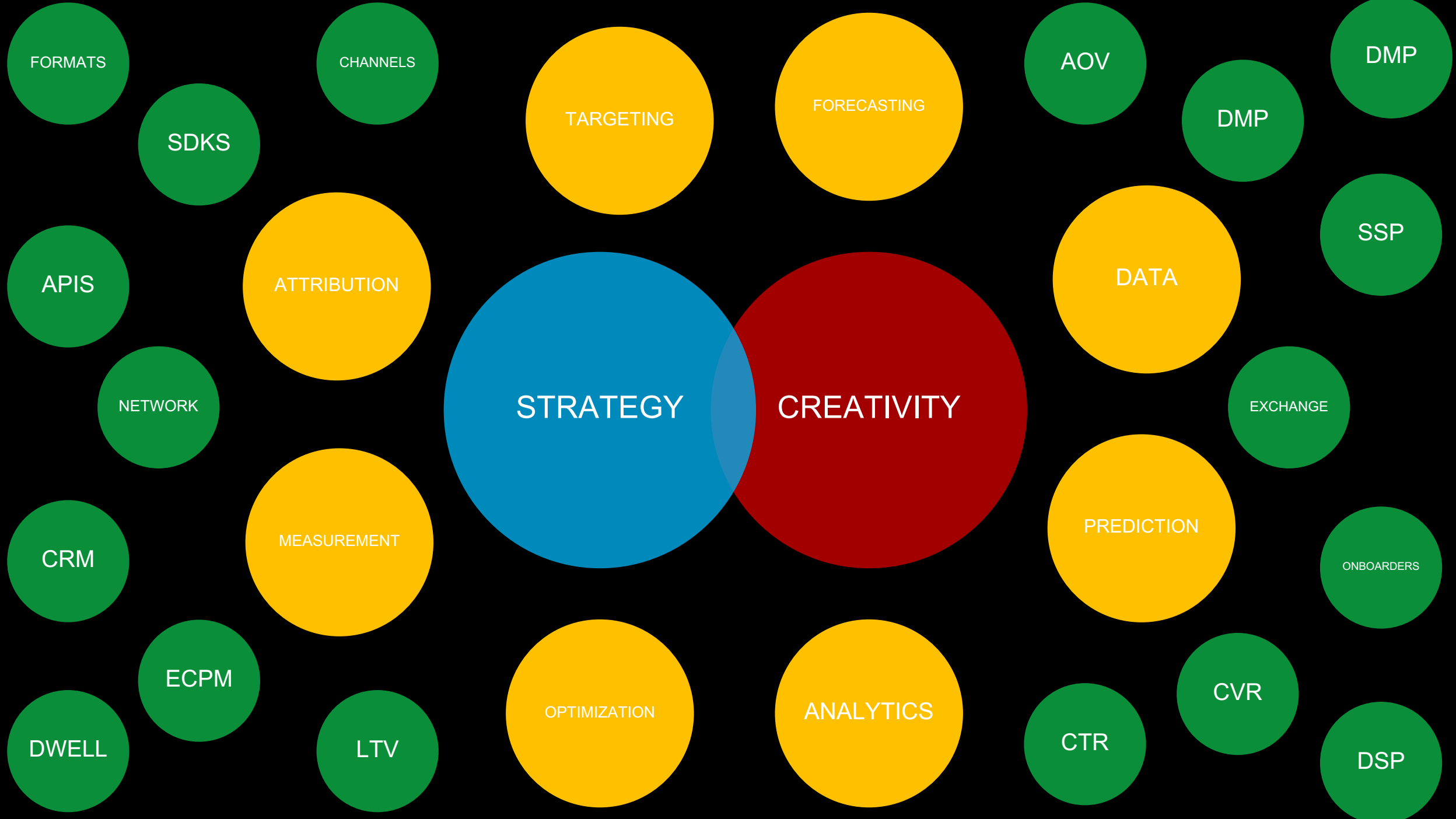
Handwritten mathematical notes and equations below the small pie chart.



Handwritten mathematical notes and equations at the bottom left of the wall.

Handwritten mathematical notes and equations at the bottom center of the wall.

Handwritten mathematical notes and equations at the bottom right of the wall.



# MARKETING TECHNOLOGY LUMAscape



CMO's now have larger technology budgets than CIOs

70% of companies here are < 10 year old

Marketing is more technology driven today, than it has ever been



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# MARKETING CHALLENGES IN CROSS BORDER COMMERCE

# The Modern Day Spice Routes

37 % OF SHOPPERS

HAVE PURCHASED GOODS FROM  
ANOTHER COUNTRY

75 % OF RETAILERS

CONSIDER INTERNATIONAL  
EXPANSION IMPORTANT

2X SPENDS

BY CROSS BORDER SHOPPERS,  
COMPARED TO DOMESTIC SHOPPERS

32 % OF RETAILERS

OFFER INTERNATIONAL  
DELIVERY TO CUSTOMERS

**(1) EXPERTISE AND FOCUS NEEDED IN FAST GROWING I18N MARKETS**



## Consumer Motivations

- ▶ Why did she buy our product?
- ▶ How did she discover us?
- ▶ What are her brand affinities?
- ▶ What cultural nuances should I be aware of?

**(2) UNDERSTANDING CONSUMER MOTIVATION IS HARD**



**(3) COMPETING FOR BRAND RECALL AMONG A CROWDED SEA OF OPTIONS**





# HOW LOCATION FITS INTO THE STORY

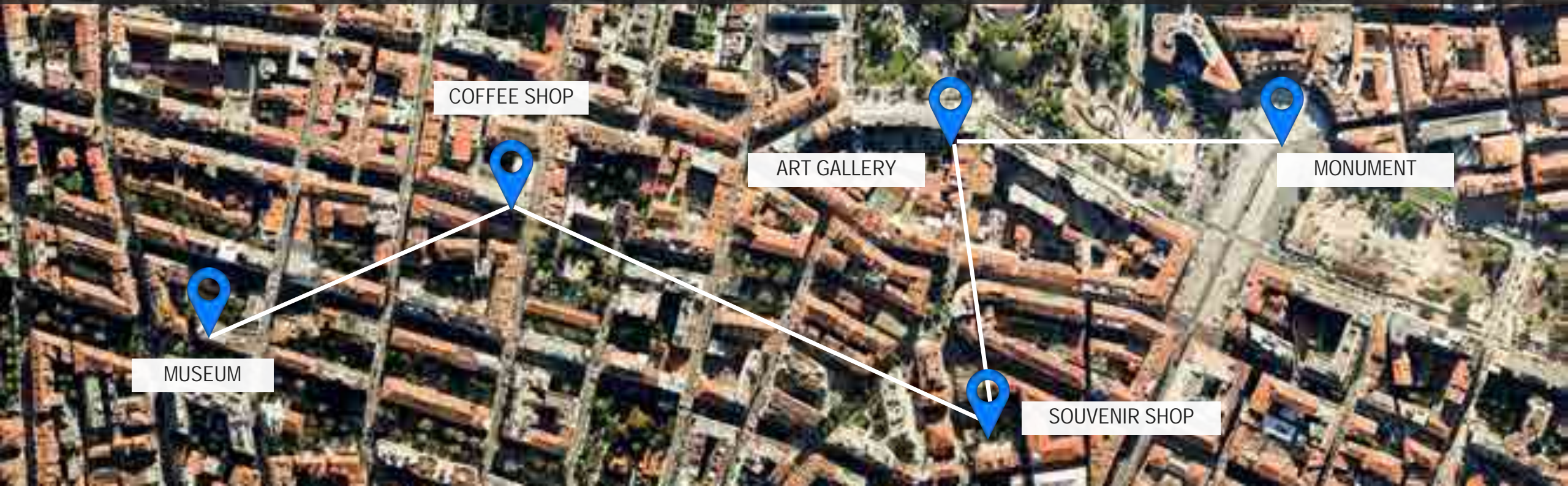
# ACTION EXPRESSES PRIORITIES

*- MAHATMA GANDHI*



# CONSUMERS' REAL WORLD ACTIONS EXPRESSES PRIORITIES THEIR TRUE INTENT

- ~~MAHATMA GANDHI~~ SASIDHAR AKKIRAJU



COFFEE SHOP

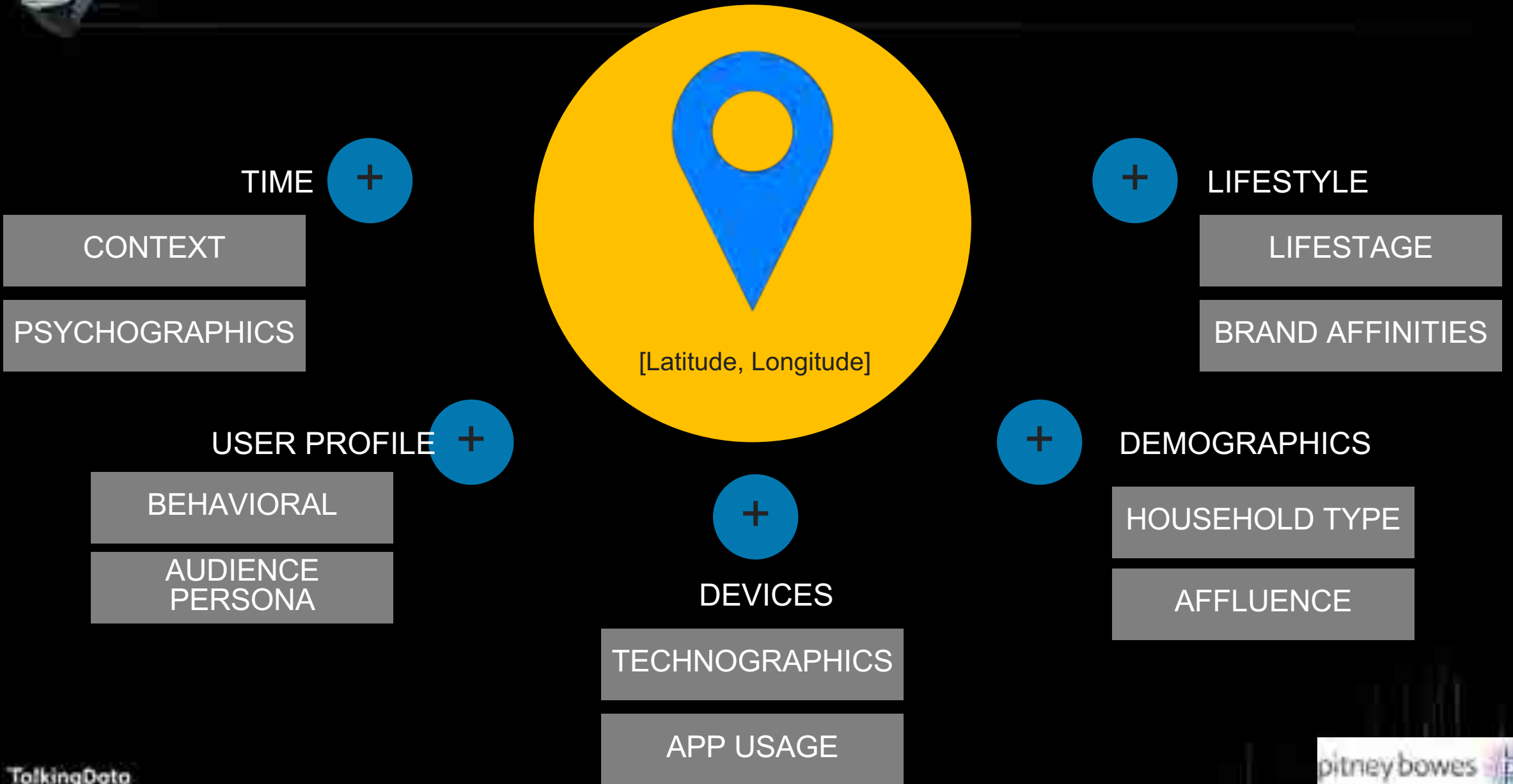
ART GALLERY

MONUMENT

MUSEUM

SOUVENIR SHOP

# Location is more than a lat-long

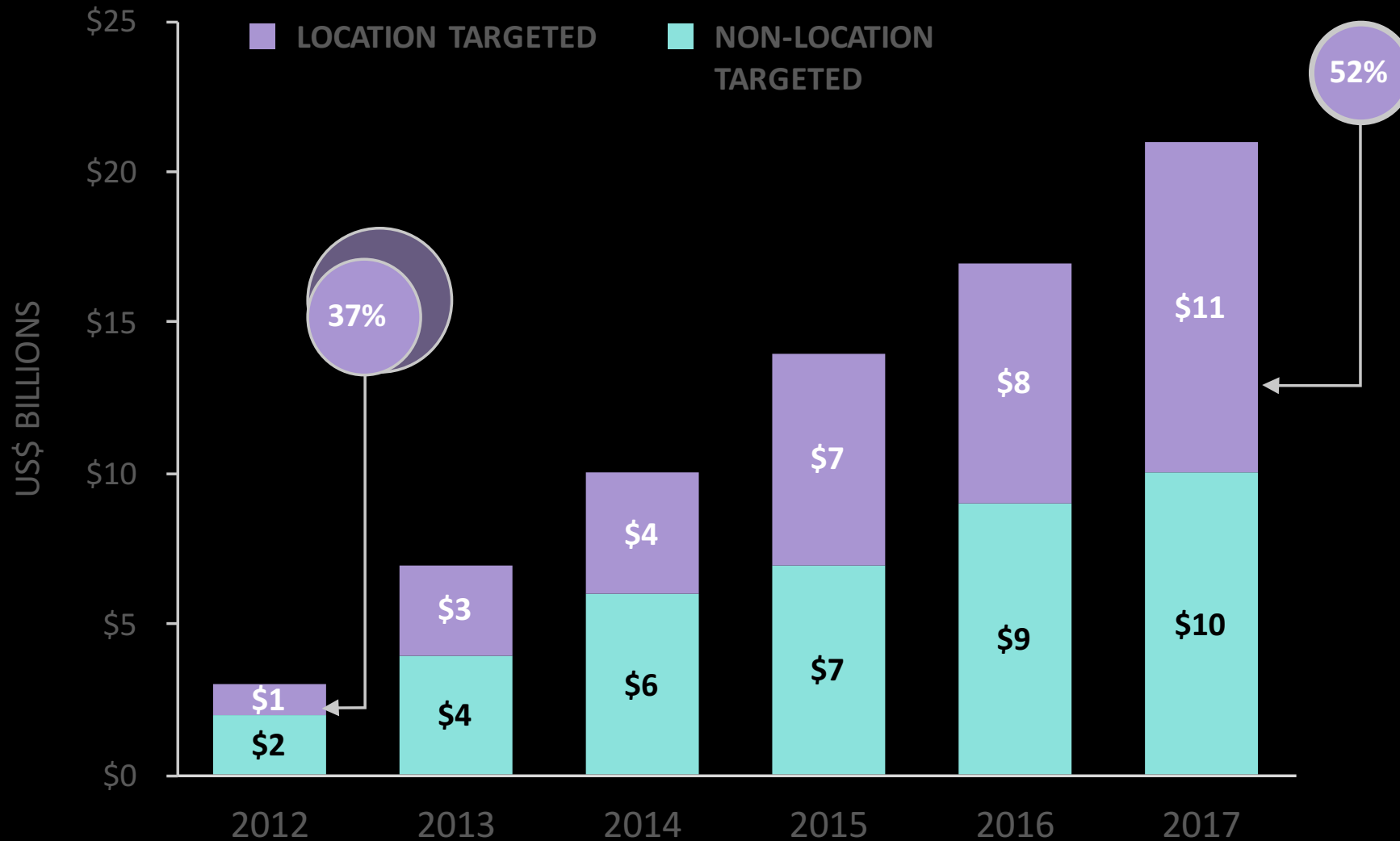






# HOW ARE MARKETERS USING LOCATION TODAY

# How marketers are using Location insights today



**LOCATION DATA WILL  
BE USED IN 52% OF  
US MOBILE  
CAMPAIGNS IN 2017**



# Case studies in utilizing Location data (1/3)

## RETAIL

### UNDERSTANDING CONSUMER VISITATION PATTERNS

Objective was to understand visits to high end retail stores, to drive demand generation for new customers.

A second order effect is to be able to understand ad effectiveness through location based attribution / when used for driving users to in-store walk-ins.





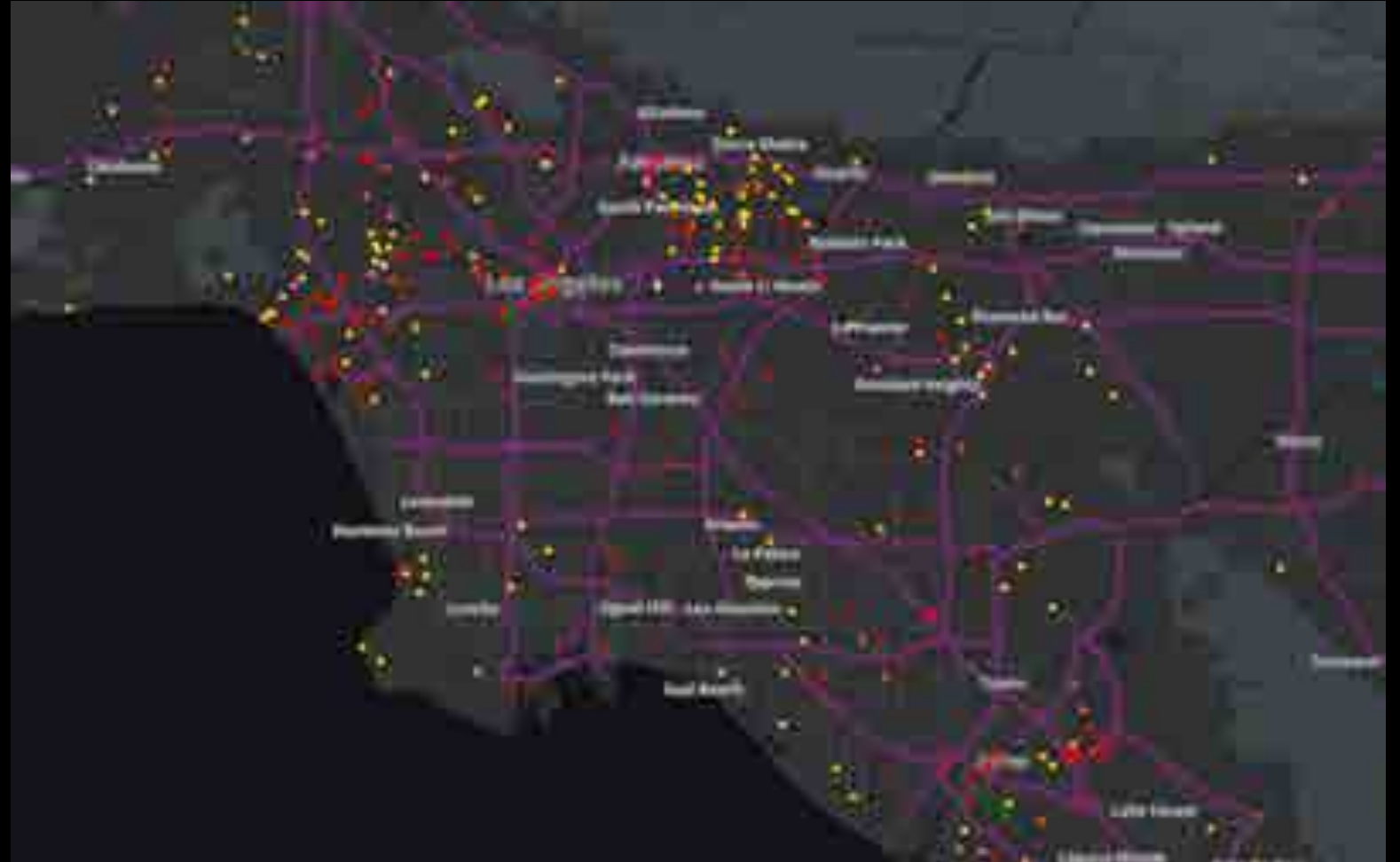
# Case studies in utilizing Location data (2/3)

## SMBS

CUSTOMERS OF MY BUSINESSES  
ALSO ARE CUSTOMERS OF X

Objective to understand existing customers, vis-a-vis customers who go into competitors stores.

Allows SMB retailers to take decisions on direct marketing - in strongholds of existing customer groups.



## Case studies in utilizing Location data (3/3)



TalkingData

## ECOMMERCE

LEARNING FROM EXISTING CUSTOMERS TO FIND OUR SOCIAL CIRCLES

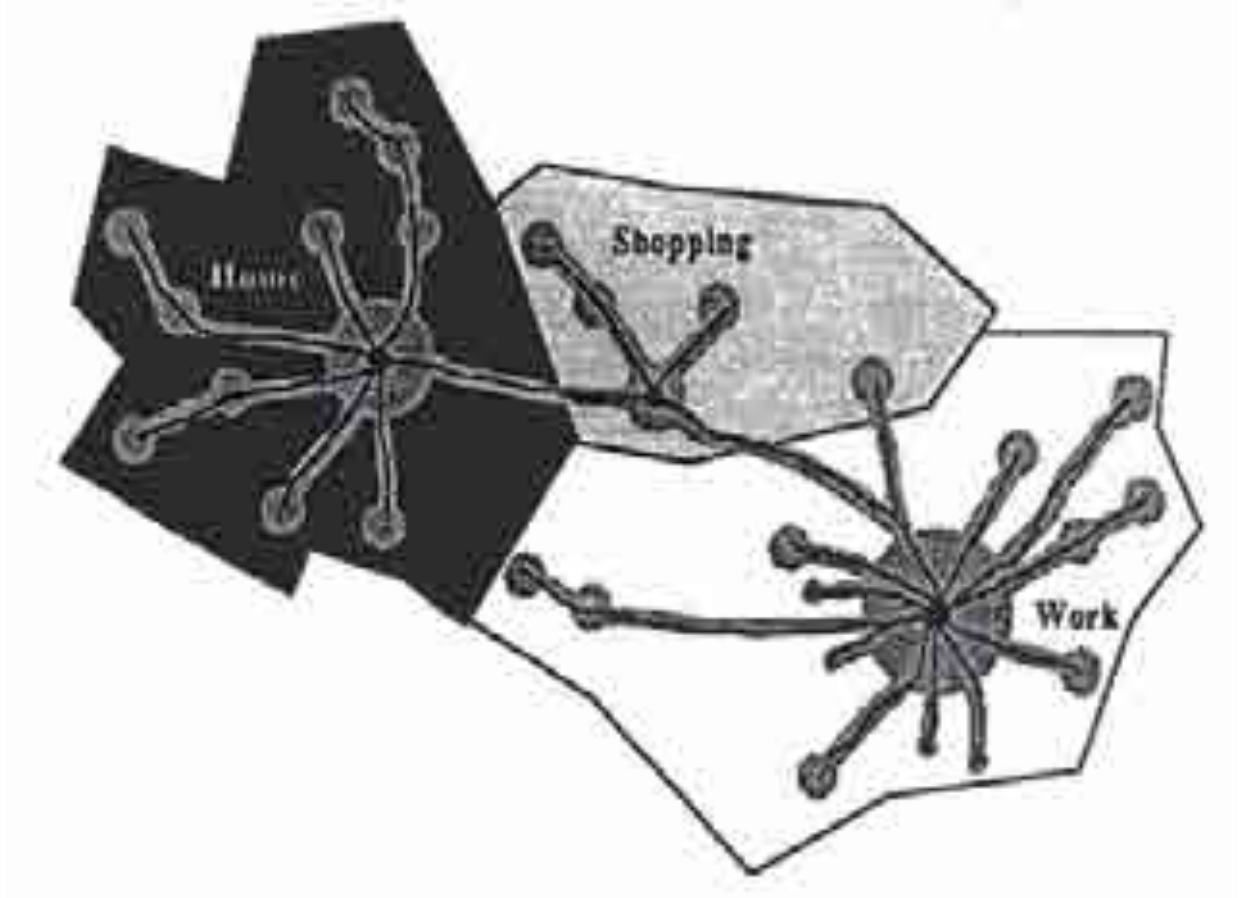
Objective to use existing customers as micro-influencers, and promote ecommerce brand to lookalikes in the neighborhood, as well as social circles (friends, family, co-workers)

Enables merchants to benefit from word of mouth, and vitality.



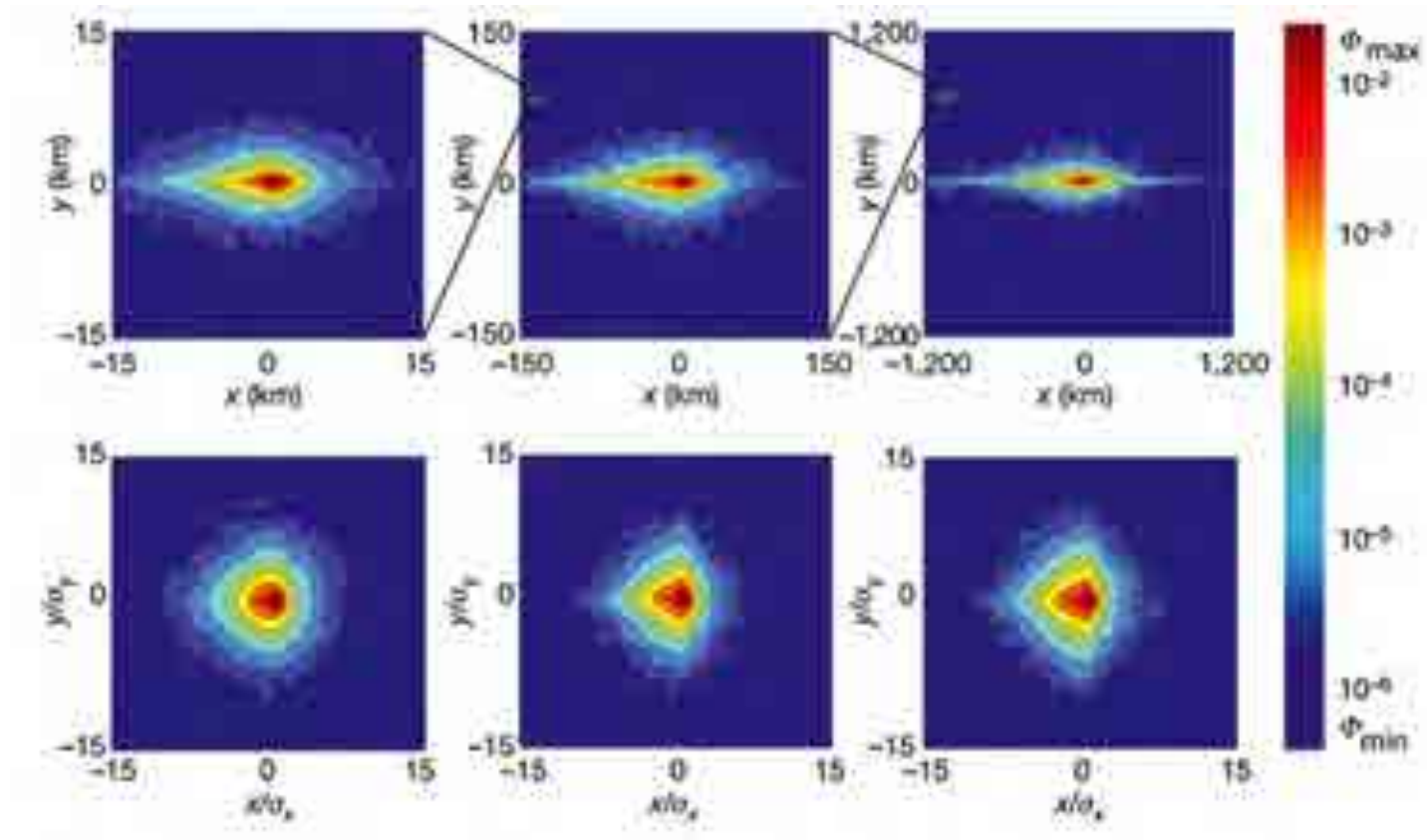
**How we model it?**  
**The Data Science Perspectives**

# Cognitive Science: A Geography of Everyday Life”



Spatial Cognitive Theory  
(Golledge, 1976)

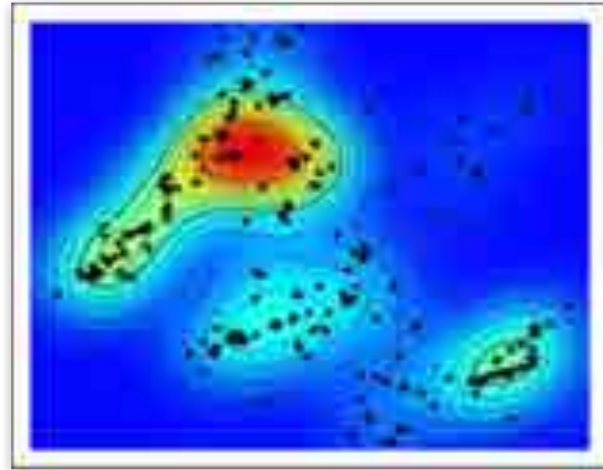
# Nature Science: Human Mobility is highly predictable



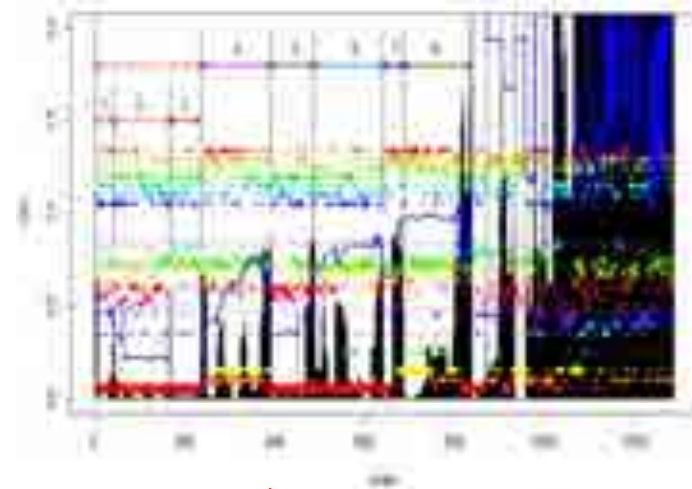
*Nature, 2008*



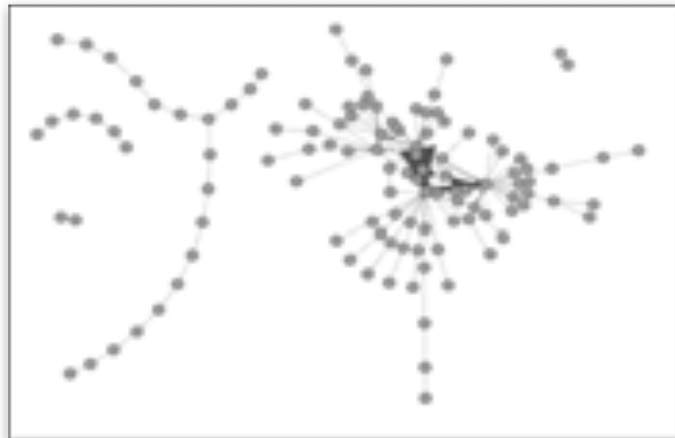
# Data Science: How we model these phenomena? [Geo-spatial methods]



Hotspot analysis (home/work)



Spatial Clustering

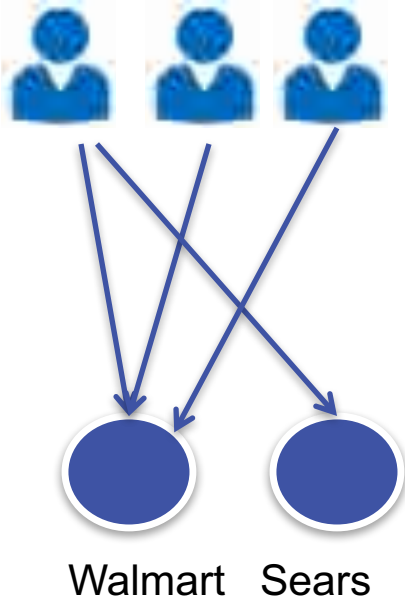


Spatial Trajectory network

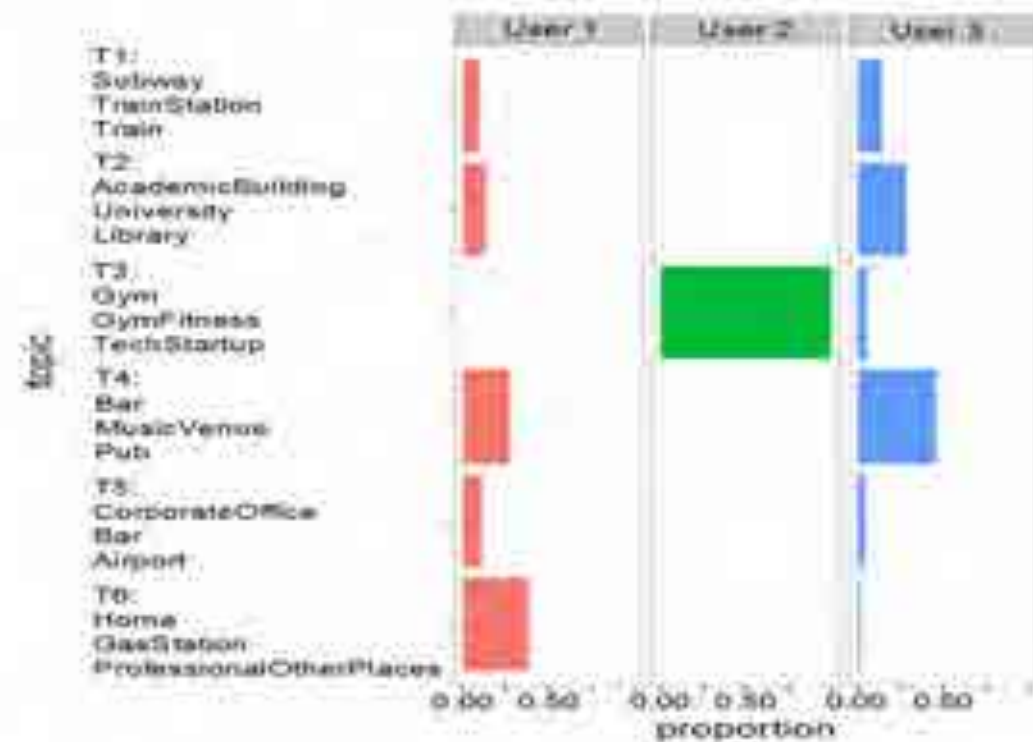


Modeling Regular Activity Areas

# Data Science: How we model these phenomena? [Graph Methods]



## Latent Dirichlet Allocation Model

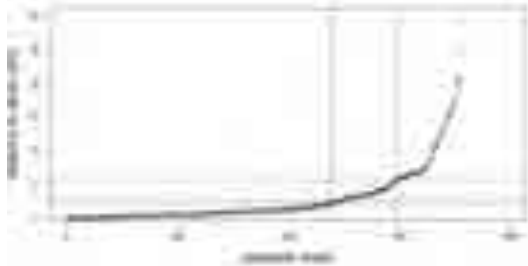
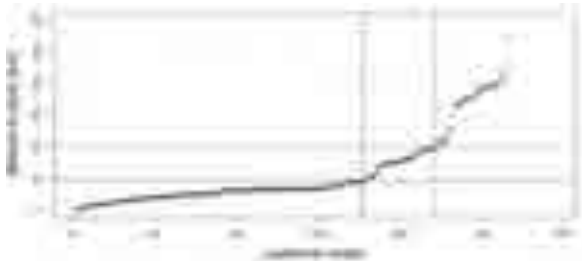


# Data Application: How we use these models? Analyzing Retail Store Trade Area using Gravity Model

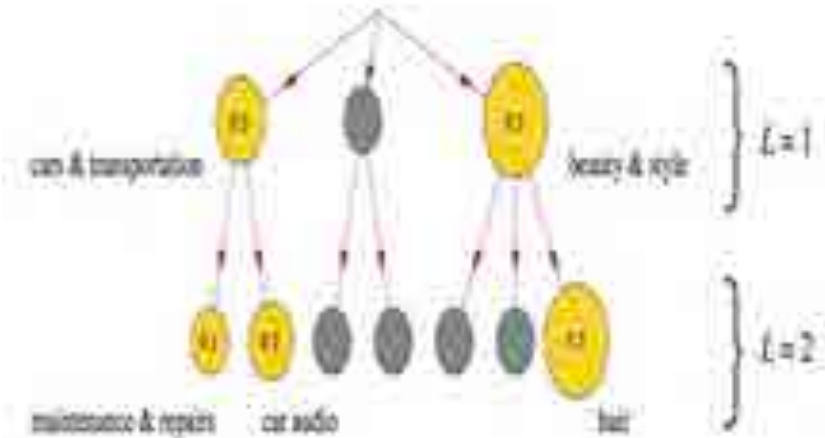
Ikea



Wholefood



# Data Application: How we use these models? Category Focus or Store Loyalty using Entropy



$$H_L = - \sum_i p_{L,i} \log(p_{L,i})$$

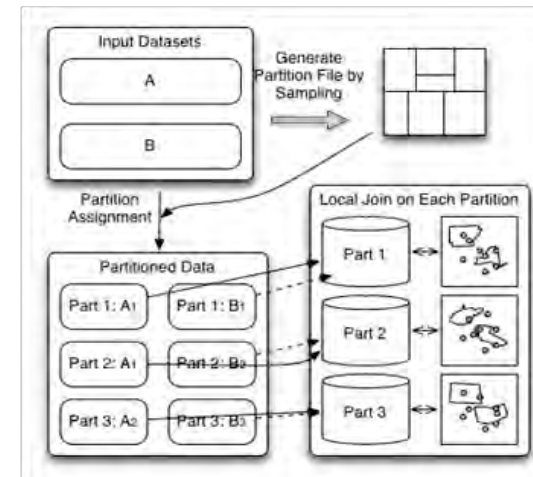
$$H_T = \sum_L H_L$$

**How we scale?  
The Data Engineering Perspectives  
[Optional]**

The background features a gradient from blue on the left to purple on the right. In the bottom right corner, there are several overlapping, wavy lines that create a sense of motion and depth, transitioning from blue to purple.

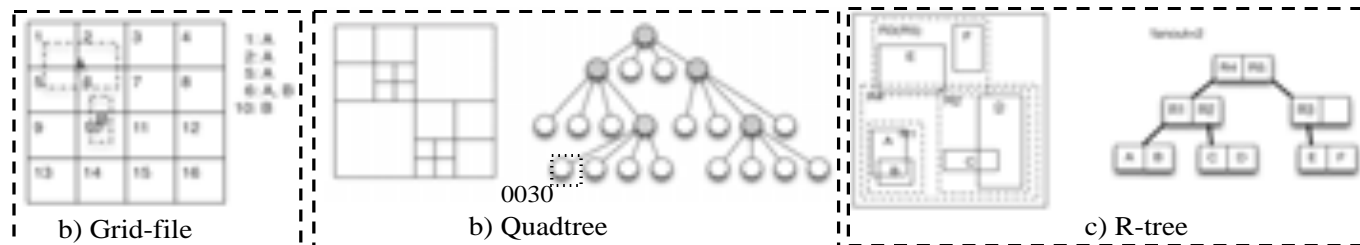
# A Data Engineer Challenge: Find which store a user visited using billions of mobile data records

**Billions of mobile records, Point-in-Polygon join of 10+ million POI-boundaries**

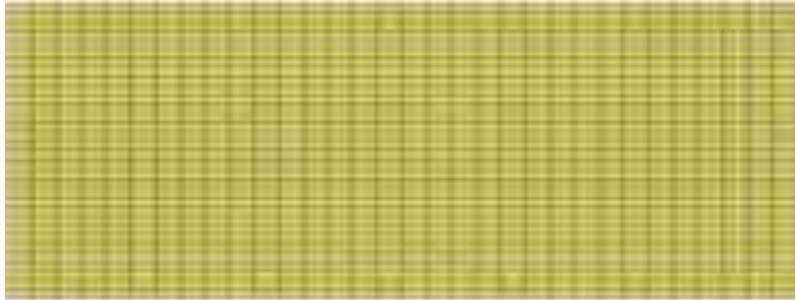


# Spatial Indexing in Hadoop/Spark

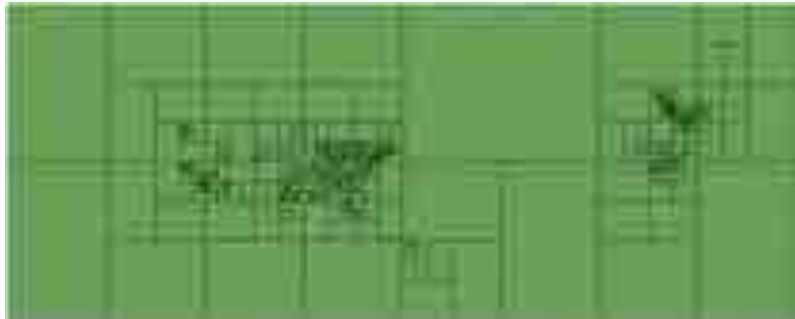
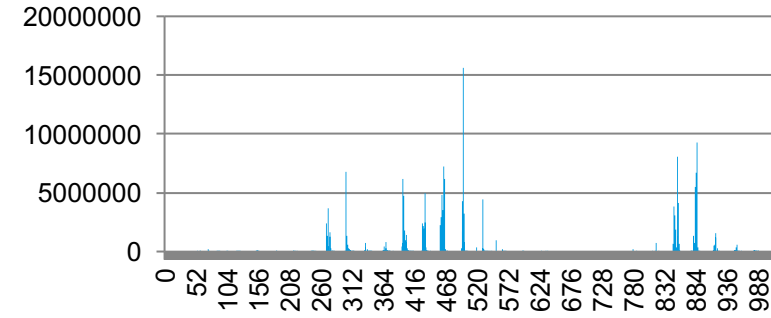
	Grid-file	Quadtree	R-tree
Partition Strategy	space-oriented	space-oriented	data-oriented
Hierarchical Structure	No	Yes	Yes
Parallelization friendly	Good	Medium	Poor
Skewness Handling	Poor	Medium	Good



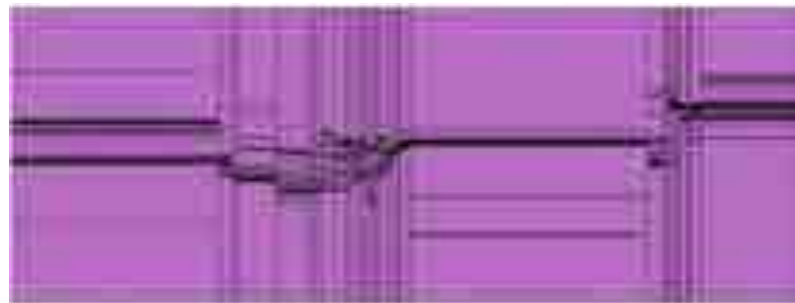
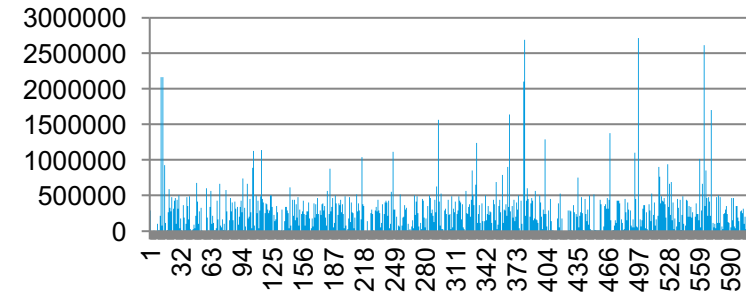
# Optimizing Spatial Partition Processes



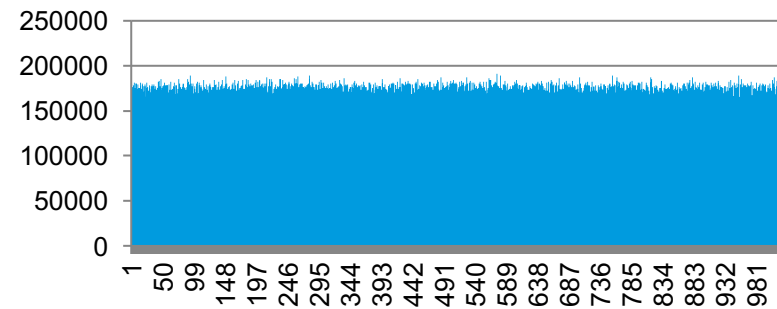
grid



Recursive Bisection



Adaptive Tile







**THANKS**