

# **Applications:**

## **What makes Big Data valuable**

# After this video you will be able to..

- Describe examples from fields where big data has enabled better models which allows for higher precision recommendations or solutions to make the world a better place

# What Makes Big Data Valuable?

**Big Data**



**Better Models**



**Higher Precision**

# What Makes Big Data Valuable?

**Big Data**



**Personalized  
marketing data**



**Happy  
customers!**



Awesome!  
Just what I was  
looking for!

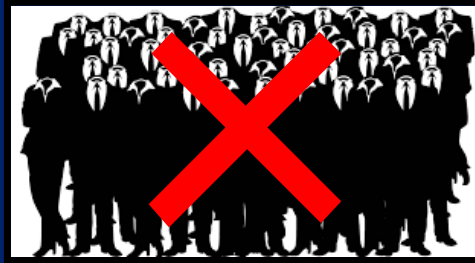


# What Makes Big Data Valuable?

I like blue plates!



I like gold plates!



# Personalized Marketing



# Recommendation Engines

Customers Who Bought This Item Also Bought

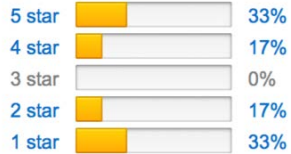


# Sentiment Analysis

## Customer Reviews

★★★★☆ 6

3.0 out of 5 stars ▾



[See all 6 customer reviews ▸](#)

Inspired by Your Shopping Trends



I love my new  
blue plates!  
Let me write  
a review.



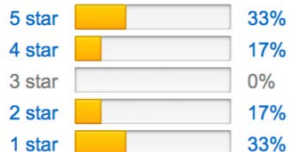


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**Ruined after first wash.**

Although I had washed my existing set in my dishwasher (set to air dry) many times without issue, two of the 4 new plates were ruined upon the initial wash. Apparently these are actually clear glass plates with some sort of blue coating, which peeled off during the washing process, leaving me with two partial clear/partial blue plates with visible peeling. I suppose I can try and scrub off the remainder of the blue coating and have usable clear plates, however - if I wanted clear plates that is what I would have purchased. Heed the warning to be very careful when washing these.

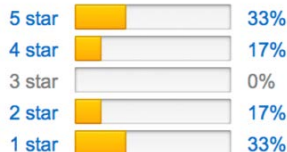


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**Wonderful. Exactly what I wanted.**



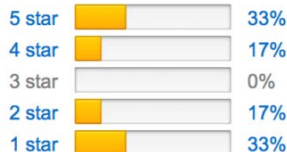
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## Natural Language Processing

# Mobile Advertising

# Mobile Advertising



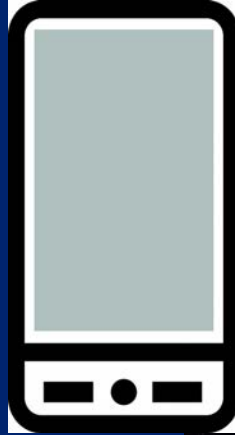
# Mobile Advertising



# Mobile Advertising



**Customer profile**  
**Recent purchases**



**Geolocation data**



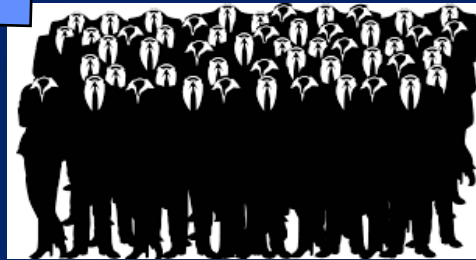
# Consumer Growth to Guide Product Growth



# Consumer Growth to Guide Product Growth



**Collective Consumer  
Behavior**



# Consumer Growth to Guide Product Growth

## Flight Schedule

Depart	Arrive	Flight #	Routing	Travel Time	Business Select \$276	Anytime \$254
6:20 AM	8:00 AM	2453	Nonstop	1h 40m	Sold Out	<input type="radio"/> \$254
7:45 AM	9:15 AM					<input type="radio"/> \$254
10:10 AM	11:40 AM	1538	Nonstop	1h 30m	Sold Out	<input type="radio"/> \$254
12:25 PM	1:55 PM	476	Nonstop	1h 30m	<input type="radio"/> \$276	<input type="radio"/> \$254
2:05 PM	3:35 PM	340	Nonstop	1h 30m	<input type="radio"/> \$276	<input type="radio"/> \$254

We like morning flights!

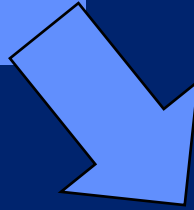
# Biomedical Applications

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2 billion human genomes  
sequenced by 2025

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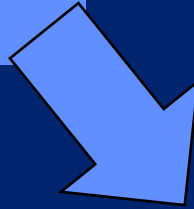
2 billion human genomes  
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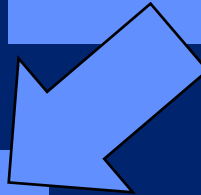
Up to 40 exabytes  
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# Biomedical Applications

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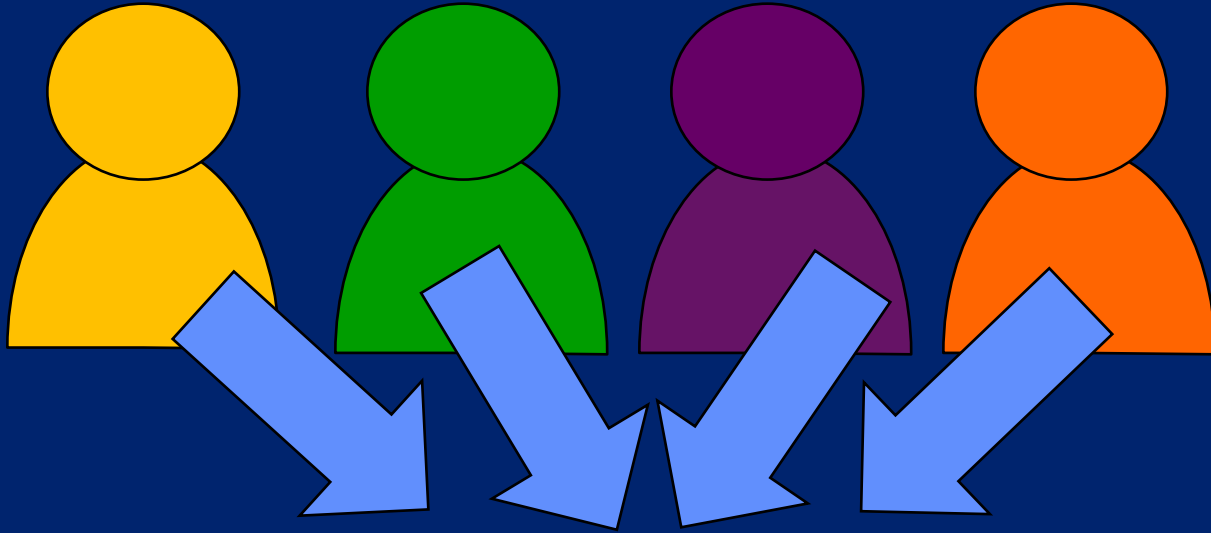


Up to 40 exabytes  
in storage!



Up to 10,000 trillion CPU  
hours for processing!

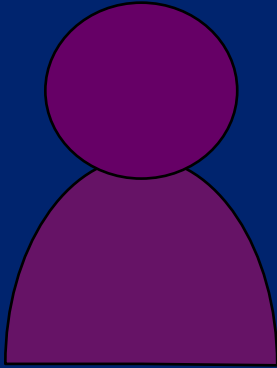
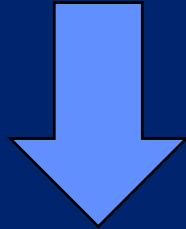
# Personalized Cancer Treatment



**Common treatment**

# Personalized Cancer Treatment

Perform large scale  
analysis of patient genes  
and tumor growth



Customized  
treatment



# The Biomedical Big Data Challenge



*Walgreens*

How to integrate sources  
to gain further insight

# Big Data-Driven Cities

# Smart Cities

- Use city wide sensor data to
  - Lower energy costs, pollution
  - Improve services, traffic, safety, ...



# How are other applications using Big Data?

Figure 4

**Industries are using big data to transform business models and improve performance in many areas**

**Illustrative**

Retail		Manufacturing	
<ul style="list-style-type: none"><li>• Customer relationship management</li><li>• Store location and layout</li></ul>	<ul style="list-style-type: none"><li>• Fraud detection and prevention</li><li>• Supply chain optimization</li><li>• Dynamic pricing</li></ul>	<ul style="list-style-type: none"><li>• Product research</li><li>• Engineering analytics</li><li>• Predictive maintenance</li></ul>	<ul style="list-style-type: none"><li>• Process and quality analysis</li><li>• Distribution optimization</li></ul>
Financial services		Media and telecommunications	
<ul style="list-style-type: none"><li>• Algorithmic trading</li><li>• Risk analysis</li></ul>	<ul style="list-style-type: none"><li>• Fraud detection</li><li>• Portfolio analysis</li></ul>	<ul style="list-style-type: none"><li>• Network optimization</li><li>• Customer scoring</li></ul>	<ul style="list-style-type: none"><li>• Churn prevention</li><li>• Fraud prevention</li></ul>
Advertising and public relations		Energy	
<ul style="list-style-type: none"><li>• Demand signaling</li><li>• Targeted advertising</li></ul>	<ul style="list-style-type: none"><li>• Sentiment analysis</li><li>• Customer acquisition</li></ul>	<ul style="list-style-type: none"><li>• Smart grid</li><li>• Exploration</li></ul>	<ul style="list-style-type: none"><li>• Operational modeling</li><li>• Power-line sensors</li></ul>
Government		Healthcare and life sciences	
<ul style="list-style-type: none"><li>• Market governance</li><li>• Weapon systems and counterterrorism</li></ul>	<ul style="list-style-type: none"><li>• Econometrics</li><li>• Health informatics</li></ul>	<ul style="list-style-type: none"><li>• Pharmacogenomics</li><li>• Bioinformatics</li></ul>	<ul style="list-style-type: none"><li>• Pharmaceutical research</li><li>• Clinical outcomes research</li></ul>

Source: A.T. Kearney analysis

# Smart and personalized business!

**Big Data**



**Better Models**



**Higher Precision**



Personalized Marketing  
Personalized Medicine  
Smart Cities  
< and more! >