

# Introduction to Digital Marketing

What are the wealthiest firms in the world?

What are the wealthiest firms in the world in 2010?

<https://www.youtube.com/embed/Z93yWXb9Tb0?enablejsapi=1>

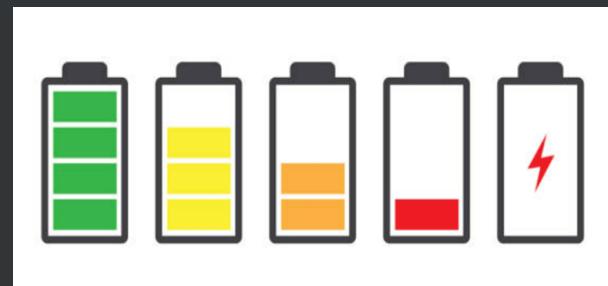
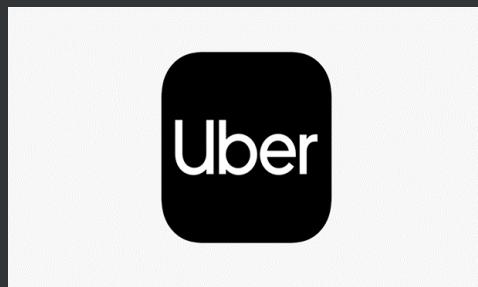
1	 Apple AAPL	HK\$ 26.788 T	HK\$1,762	▲ 0.59%		 USA
2	 Microsoft MSFT	HK\$ 24.244 T	HK\$3,262	▼ 0.61%		 USA
3	 NVIDIA NVDA	HK\$ 23.885 T	HK\$971.01	▲ 1.40%		 USA
4	 Alphabet (Google) GOOG	HK\$ 15.707 T	HK\$1,284	▲ 0.96%		 USA
5	 Amazon AMZN	HK\$ 14.484 T	HK\$1,380	▼ 0.30%		 USA
6	 Saudi Aramco 2222 SR	HK\$ 14.176 T	HK\$58.62	▲ 0.18%		 S. Arabia
7	 Meta Platforms (Facebook) META	HK\$ 10.399 T	HK\$4,111	▼ 1.84%		 USA
8	 Berkshire Hathaway BRK-B	HK\$ 7.465 T	HK\$3,465	▲ 0.83%		 USA
9	 TSMC TSM	HK\$ 7.055 T	HK\$1,360	▲ 0.33%		 Taiwan
10	 Eli Lilly LLY	HK\$ 6.471 T	HK\$7,187	▼ 1.02%		 USA

HSBC is the largest bank in Hong Kong.  
Let's see HSBC's stock performance.



What's wrong with HSBC?

Uber, the leading ride-hailing APP, collects data on your smartphone's battery level. But why?



Uber charges you higher prices when your battery is running low.

## **Uber charges more from users if their phone battery is low, report claims**

According to a small study by the Belgian newspaper Dernière Heure, Uber charged 6 per cent more for a journey made on a smartphone with only 12 per cent of battery remaining compared to the same journey.

More specifically, when your battery is less than 12%, Uber will charge you 6% more for your journey.

Lenddo, a Singaporean based start-up, helps financial institutions collect your social network data, but why?



The firm analyzes your social network to estimate your credit score and decides whether to offer you a loan.

**MARKETING SCIENCE**

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## Credit Scoring with Social Network Data

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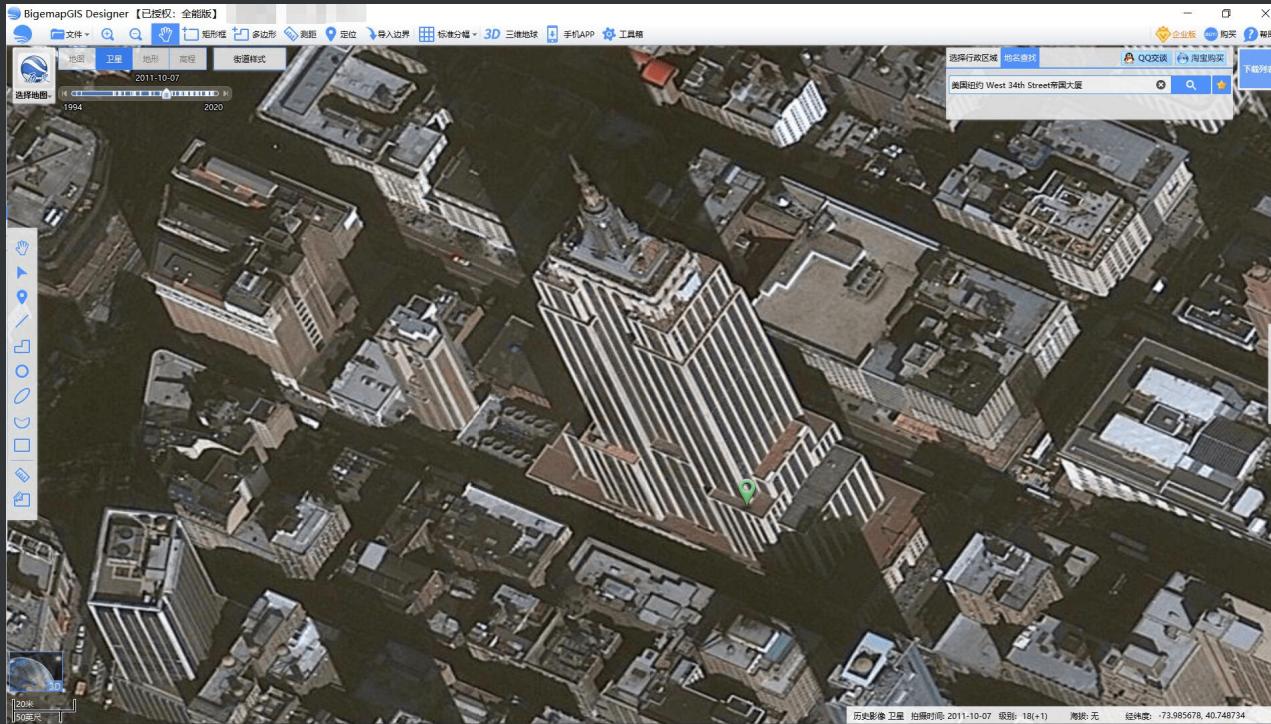
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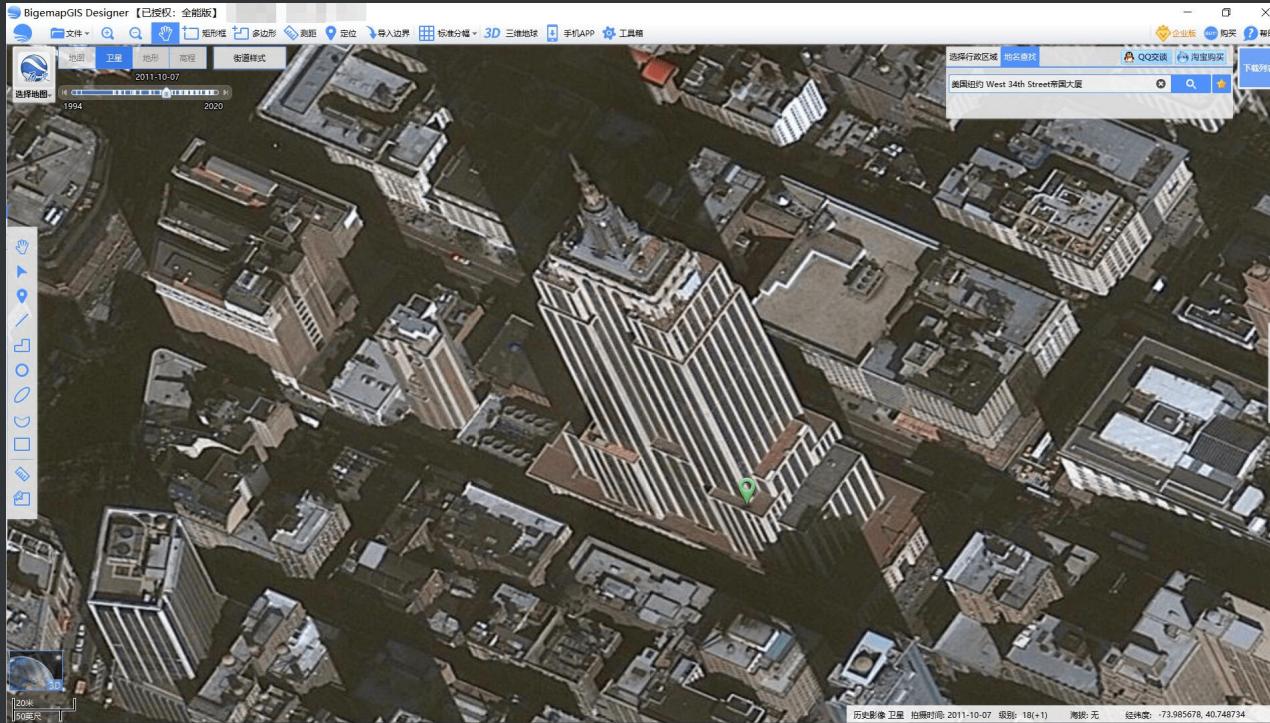
Chrysanthos Dellarocas

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US retailers Target and Kroger both purchase real-time satellite images from RS Metrics. But why?



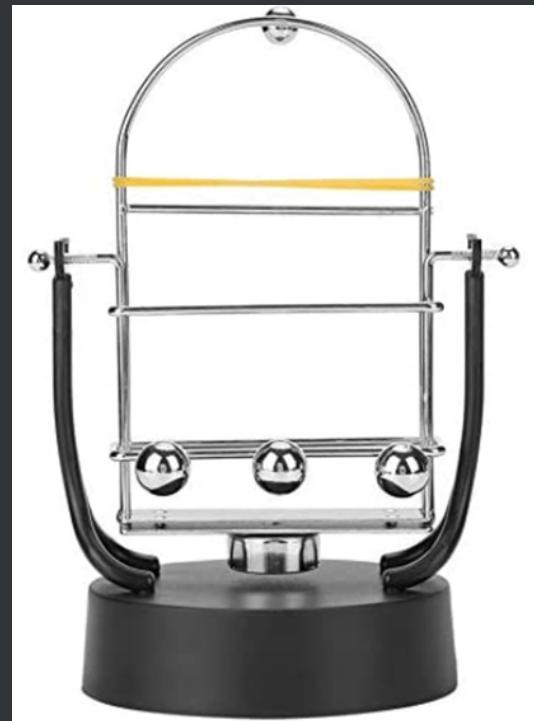
They monitor the competitors' carpark to estimate the competitors' performance and revenue.



What is this?



It is a phone cradle.  
Why do people spend money buying it?





**Matthew Brennan** @mbrennanchina · May 14, 2019

Chinese phone cradle for boosting your phone's daily step count. Some insurance companies in China allow people who consistently reach a certain daily step count to get discounted health insurance premiums.



**Lê Nguyên Hoang (Science4All)** @le\_science4all · May 14, 2019

Replying to @mbrennanchina

Aka adversarial poisoning attack on data-driven algorithms...



1 ↗ 9

1 ❤ 97



**Graeme Douglas** ✅ @graemedouglas · May 14, 2019

Replying to @mbrennanchina and @BBHLabs

Not just China - Vitality does this in the U.K.

1 4

1 ↗ 5

1 ❤ 66





# Netflix: How did it know I was bi before I did?

After BBC reporter Ellie House came out as bisexual, she realised that Netflix already seemed to know. How did that happen?

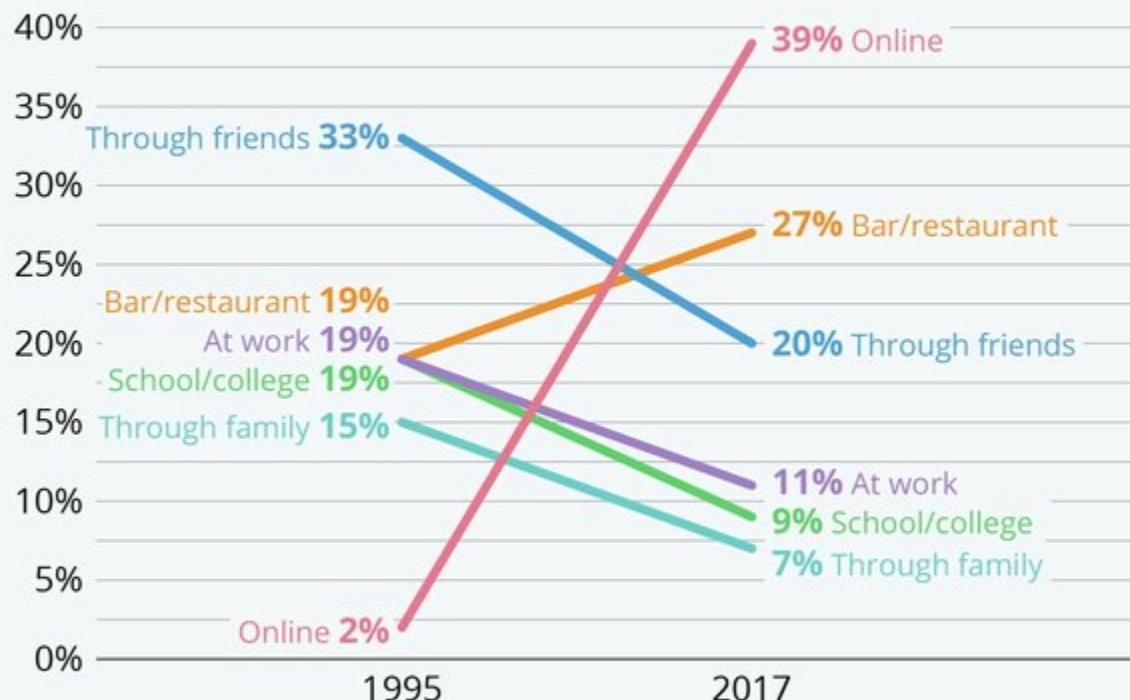
Why do offline sellers offer free Wi-Fi to users?



What percentage of couples meet online?

# How Couples Met

Share of heterosexual U.S. couples who met in the following ways



Survey of 5,421 adults. Other options: In church, in the neighborhood  
Source: How Couples Meet and Stay Together surveys by Stanford University



Meeting Place	Overall	18-26	27-42	43-58	59-77	78+
Online dating apps	44.90%	42.15%	47.59%	44.97%	36.56%	28.77%
Online video games	25.50%	22.86%	29.31%	22.34%	10.57%	34.25%
Concerts/ Festivals	31.76%	23.56%	34.91%	34.42%	27.75%	47.95%
Speed dating	21.24%	14.07%	24.04%	21.22%	20.26%	57.53%
Through a social club/hobby (e.g. a running club)	30.00%	26.98%	30.79%	31.07%	27.75%	49.32%
At the gym	14.78%	13.45%	15.64%	14.31%	14.54%	16.44%
Through work	26.22%	24.34%	26.06%	28.12%	37.00%	5.48%
Through social media	26.52%	31.49%	25.44%	27.21%	14.10%	4.11%
Through a friend	33.48%	37.79%	31.00%	34.31%	40.97%	5.48%
At a party	20.94%	19.44%	20.58%	22.84%	30.84%	2.74%
In a bar/ club	19.50%	13.69%	18.77%	28.32%	25.99%	6.85%
In a grocery store	9.42%	7.78%	8.73%	12.49%	15.86%	0.00%
On public transport	5.44%	4.82%	4.98%	7.41%	6.61%	1.37%

Eye-tracking is a new technology which allows you to observe the eye fixations of your consumers. Let us take a look at the following example.

Media: Dispens-01.jpg  
Time: 00:00:00.000 - 00:00:06.033  
Participant filter: All

21.75 secs



## Ex<sup>®</sup> - gentle for the most sensitive skin.

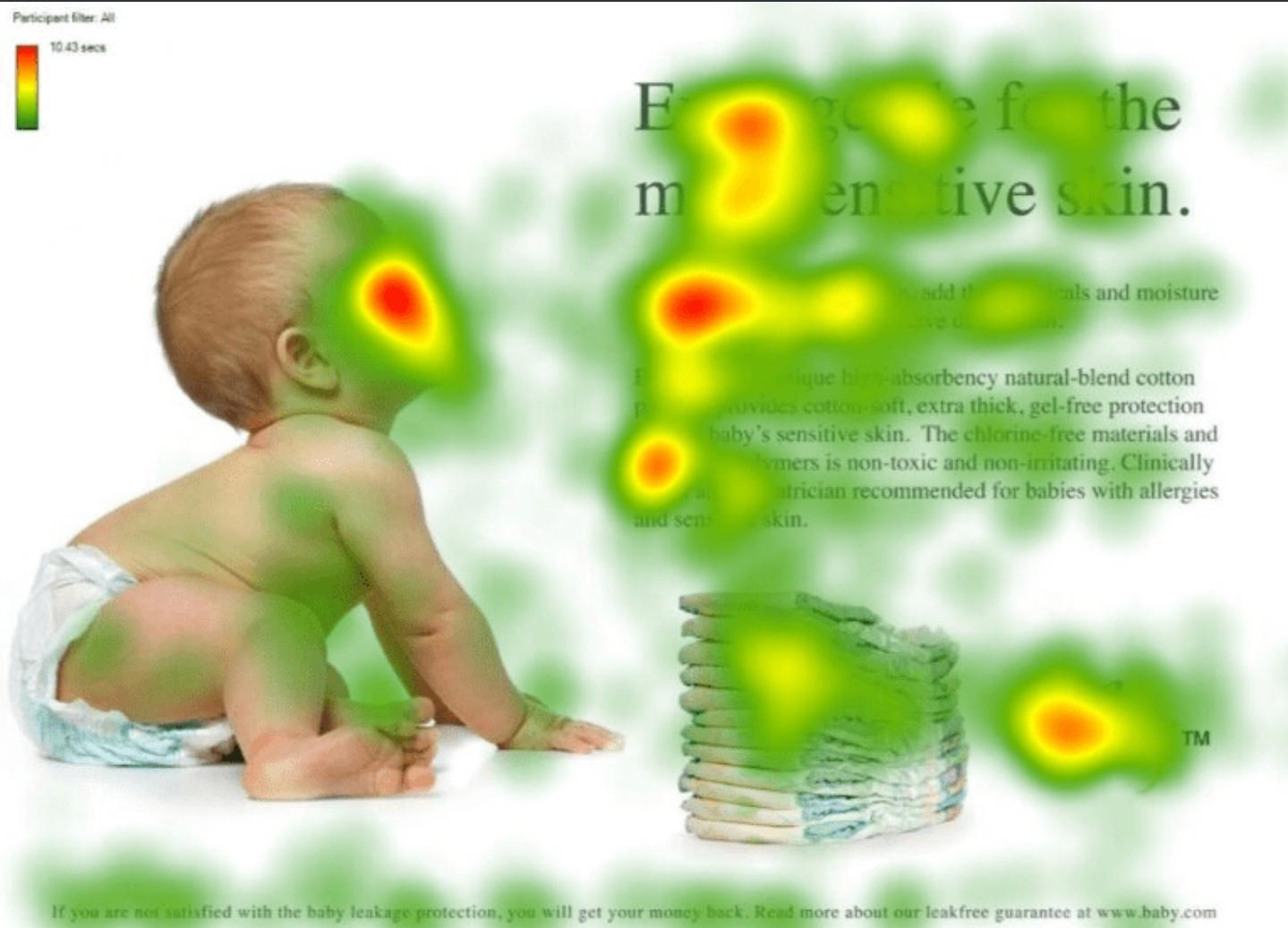
Sensitive skin needs extra protection. To help protect your baby's sensitive skin, add the chemicals and moisture that can cause diaper rash.

Baby Wipes' unique high-absorbency natural-blend cotton fibers provide cotton-soft, extra thick, gel-free protection for your baby's sensitive skin. The chlorine-free materials and absorbent polymers is non-toxic and non-irritating. Clinically tested and pediatrician recommended for babies with allergies and sensitive skin.



If you are not satisfied with the baby leakage protection, you will get your money back. Read more about our leakfree guarantee at [www.baby.com](http://www.baby.com)

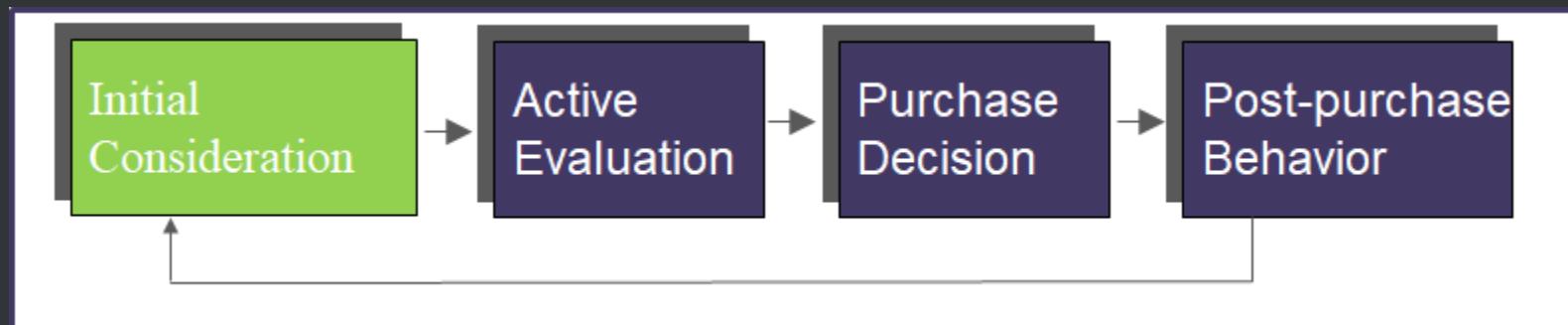
What's wrong with the ad? How to fix it?



Question:

How does the Internet affect our purchase decisions?

## The purchase journey:



### Initial consideration:

- By consumers
- By traditional media such as TV ads
- How does digital media help?

# Via targeted online/mobile ads:

Word of the Day   Translate   Games   Blog

definitions

 **NORDSTROM**   
FREE SHIPPING  
FREE RETURNS  
ALL THE TIME.

Word of the Day **eudemonic**  
pertaining or conducive to happiness. [More...](#) 

SIGN UP:  
 

[Previous Words](#)

How do you pronounce **pronunciation?**  
...  
*Why is this common word*

Your Word Wednesday 

Pick our Word of the Day!

What's your favorite word?

Do You Give Presents or Gifts? 

Our Blog 

Did Charles Dickens coin

Friday, December 18  
Decem- means "ten" in Latin, so why is December our twelfth month? [Learn more here.](#)

(919) 439-1569   
**UNLIMITED CONFIDENCE**  
— *Unlimited Mileage Warranty* —

 Certified Pre-Owned by Mercedes-Benz



**Leith, Inc.**  
Authorized Mercedes-Benz Dealer 

Dictionary.com Social

## Via influencers:

sincerelyjules PHOTO sincerelyjules PHOTO

The image displays two side-by-side Instagram posts from the account 'sincerelyjules'. Both posts feature the same woman, Jules, modeling different outfit looks. In the left post, she is wearing a white t-shirt with 'LFI' printed on it, layered over a dark top, paired with high-waisted, distressed blue jeans and brown pointed-toe booties. She is standing outdoors against a brick wall. The right post shows her in a light blue denim jacket over a patterned top, paired with light-colored pants and brown pointed-toe booties, standing outdoors near a building with large windows.

19176 likes

sincerelyjules Happy Sunday! 🌞 We #Célfie tee again!

view all 234 comments

\_julietteeee\_ @\_manue\_\_ canon

21837 likes

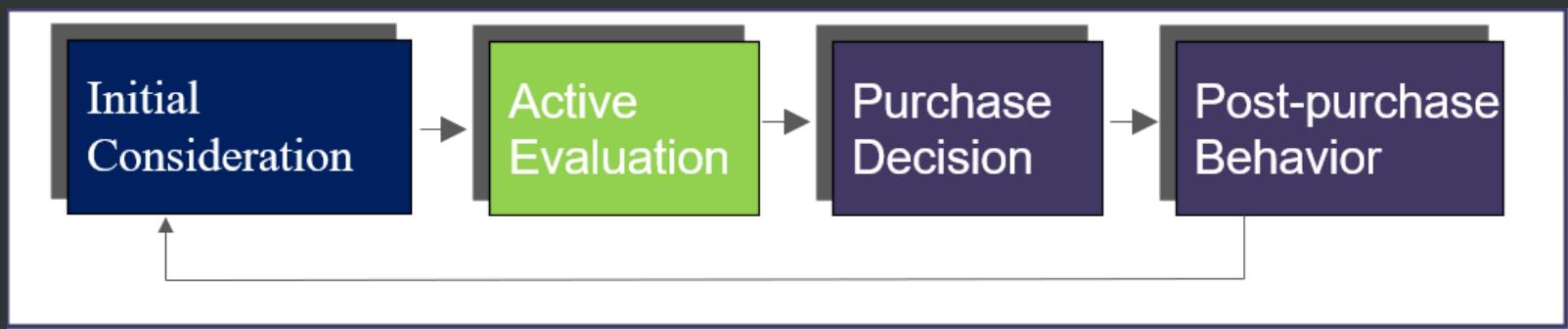
sincerelyjules Yesterday's easy breez

view all 293 comments

iamxoxoasia @sincerelyjules u have c

love to have them! i love them!

The purchase journey:



How is search done in the offline world?

- Call/visit stores/friends
- Asymmetric information and high search costs

How does Internet facilitate information search?

# Low cost search by search engines:

The screenshot shows a flight search results page. On the left, there's a sidebar with "OUR ADVICE" and a "Buy now" button with a graph icon. It also includes a "Track prices" toggle switch set to "OFF" and a note about price trends. Below that is a "Fee Assistant" section with options for "Carry-on bag" and "Checked bag", both currently at 0. Under "Stops", "Nonstop" is selected and costs \$147, while "1 stop" costs \$154.

The main content area has three sorting options: "Cheapest" (\$147, 1h 35m), "Best" (\$147, 1h 40m, underlined), and "Quickest" (\$162, 1h 34m). A "Other Sort" link is also present.

A large box highlights a Delta flight from Raleigh to New York. It features the Delta logo, the text "Delta® Flights from Raleigh to New York", a promotional message about free in-flight entertainment, the price "\$162 nonstop", and a "View Deal" button.

Below this are two more flight options. The first is "Cheapest" from American Airlines, departing at 5:35 am and arriving at 7:10 am, nonstop from RDU to LGA, taking 1h 35m. The second is another "Cheapest" option from United Airlines, departing at 1:40 pm and arriving at 3:15 pm, nonstop from EWR to RDU, taking 1h 35m. Both have a "Rating: 9" and a "View Deal" button.

# Coupons can be found more easily.

The Honey app interface shows a search bar, navigation links (STORES, DROPLIST, HONEY GOLD, FREE GIFT CARDS, HELP), and a user icon. A sidebar indicates 'Onboarding REGISTRATION' and '+ 6.50'. The main area displays 'Top Deals Today' (30s ago) with three items:

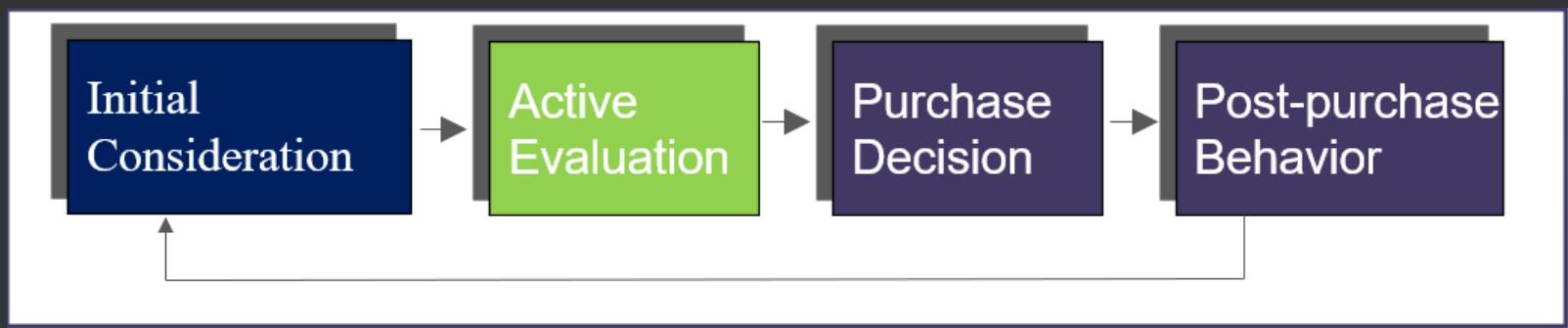
- Macy's**: Worked 1h ago. 25% OFF BCK Plus Extra 25% with Code PREVIEW. Shop Now at [Macy's.com](#). Valid 8/21-8/25. 2,437 users, \$55.88 avg savings. [Shop](#)
- JCPenney**: Worked 1m ago. Coupon Code COM278. 2,301 users, \$26.00 avg savings. [Shop](#)
- Forever21**: Worked 2m ago. Coupon Code WCR. 2,140 users, \$12.29 avg savings. [Shop](#)

**Macy's FRIENDS & FAMILY**  
WEDNESDAY, DECEMBER 1 - MONDAY, DECEMBER 5  
WE'RE SHARING A VERY SPECIAL DISCOUNT WITH YOU:  
**AN EXTRA 25% OFF\***  
REGULAR SALE & CLEARANCE ITEMS,  
INCLUDING THE DESIGNER NAMES YOU LOVE!  
EXTRA 10% OFF ELECTRONICS, ELECTRONICS,  
HOME & KITCHEN, FURNITURE,  
GET AN EXTRA \$10 OR 25% OFF AFTER YOU SPEND \$100 AT [MACYS.COM](#),  
PLUS GET FREE SHIPPING WITH YOUR ONLINE PURCHASE OF \$50 OR MORE.  
Enter code **MACYFAM** at checkout. \*Offer valid in-store and online.  
Visit [macysonline.com/coupons](#) for details and exclusions.

**FRIENDS & FAMILY**  
An extra 25% off regular sale & clearance items.  
EXTRA 25% OFF\*  
REGULAR SALE & CLEARANCE ITEMS,  
INCLUDING THE DESIGNER NAMES YOU LOVE!  
EXTRA 10% OFF ELECTRONICS, ELECTRONICS,  
HOME & KITCHEN, FURNITURE,  
GET AN EXTRA \$10 OR 25% OFF AFTER YOU SPEND \$100 AT [MACYS.COM](#),  
PLUS GET FREE SHIPPING WITH YOUR ONLINE PURCHASE OF \$50 OR MORE.  
Enter code **MACYFAM** at checkout. \*Offer valid in-store and online.  
Visit [macysonline.com/coupons](#) for details and exclusions.

**Get the coupon.**  
Now in the [@ app](#).  
Or text TOYS or TOY to 845727.

The purchase journey:

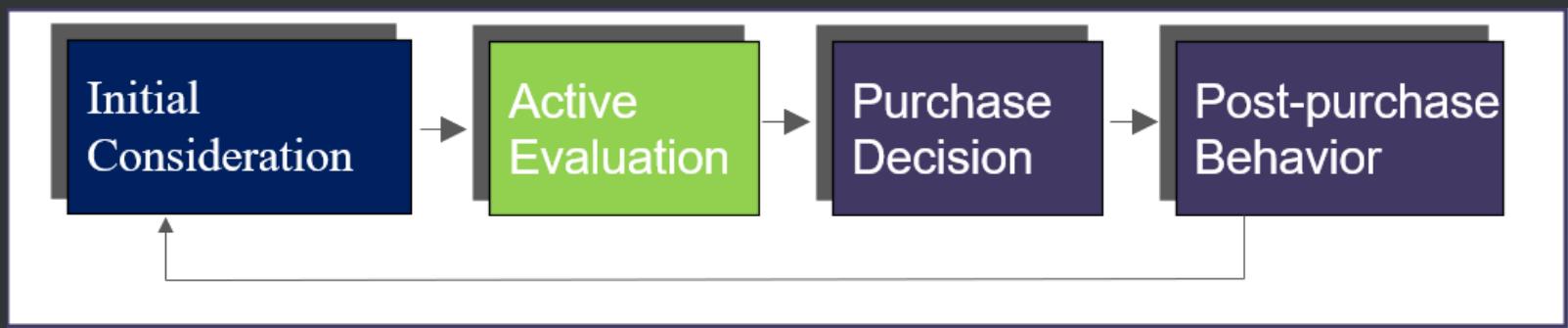


Implications of reduced search costs?

- More competition
- Less brand loyalty

What can firms do to fight against price competition?

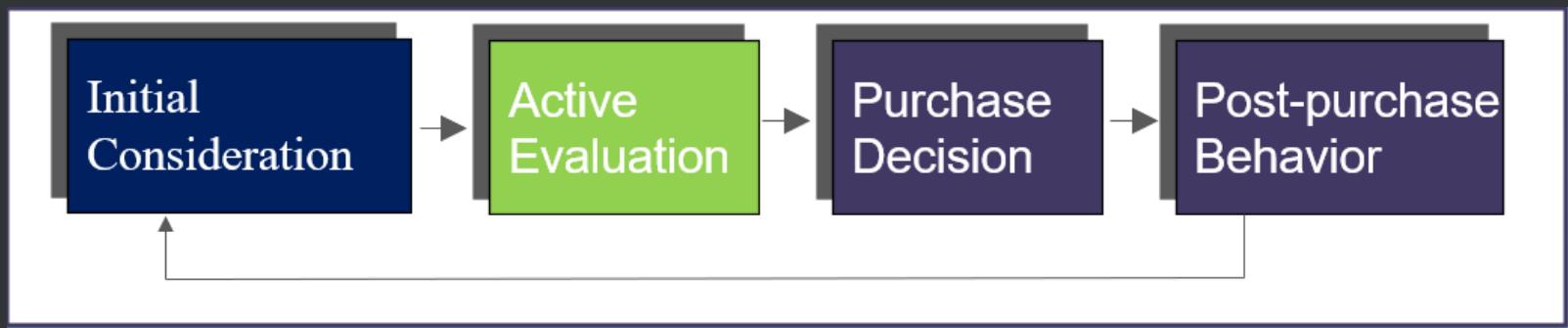
## The purchase journey:



What can firms do to fight against price competition?

- Increase price differentiation, even just perceived
- Increase switching cost (e.g., loyalty programs)

The purchase journey:



Evaluate alternatives in consideration set

- Is the product performing as claimed?
- Are there any unobservable attributes?
- Does this product match my preference?

How does Internet & digital media facilitate evaluation?

# User-Generated Content

japanese restaurant Chapel Hill, NC

Filters

\$    \$\$    \$\$\$    \$\$\$\$    Open Now    All Filters

---

 1. MinGa  
★★★★★ 85 reviews  
\$\$ - Korean, Japanese

116 Old Durham Rd  
Chapel Hill, NC 27517  
(919) 933-1773

 2. Oishii  
★★★★★ 50 reviews  
\$\$ - Sushi Bars, Japanese

1129 Weaver Dairy Rd  
Chapel Hill, NC 27514  
(919) 932-7002

 3. Akai Hana Japanese Restaurant  
★★★★★ 108 reviews  
\$\$ - Japanese, Sushi Bars

206 W Main St  
Carrboro, NC 27510  
(919) 942-6848

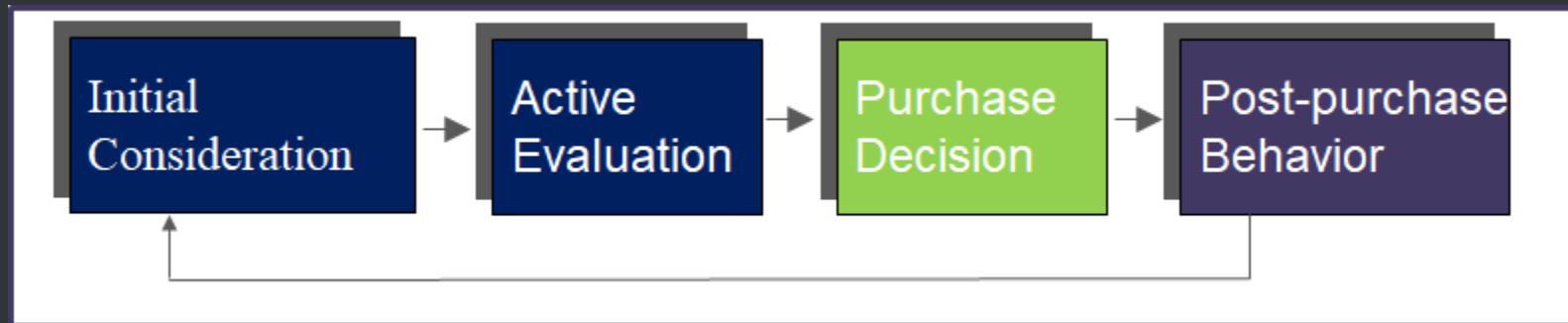
 4. Sushi Nikko  
★★★★★ 40 reviews  
\$\$ - Japanese

104 NC 54  
Carrboro, NC 27510  
(919) 240-5046

Which restaurant?

Rating vs. Volume

## The purchase journey:



Purchase at an online store, offline store, or through a mobile app

# Showrooming

The practice of examining products in a store and then buying it online for a lower price.

Top categories affected by showrooming?

- Electronics & Appliances
- Books & Music
- Clothing & Shoes
- Furniture & Home

60% in 2013 -> 35% now. Why?

# Showrooming

60% in 2013 -> 35% now. Why?

- Increasing online presence for traditional retailers
- Offer price matching
- Digital friendly in-store environment (e.g. e-payment, digital coupons)
- Flexible return policy

## Webrooming

Webrooming refers to the process of researching products online and then visiting a store to make a purchase

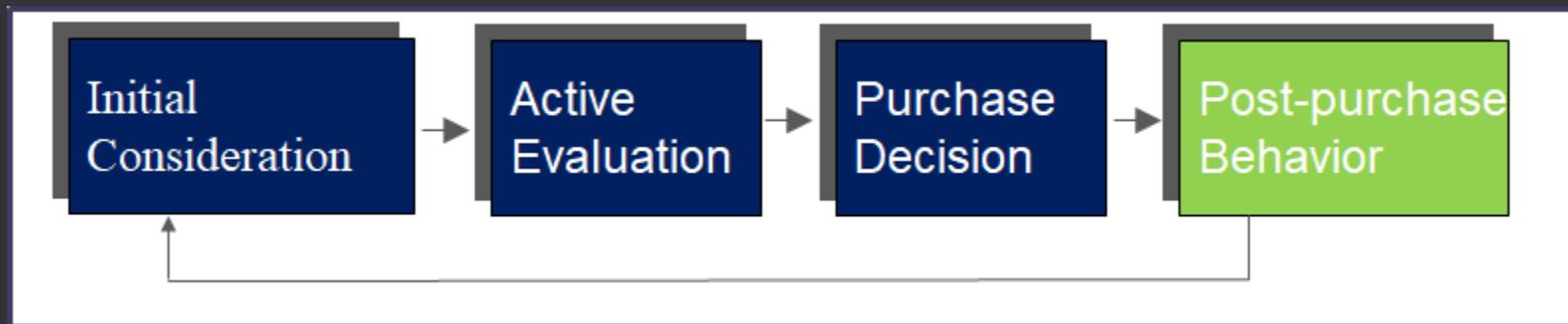
Webrooming is more common than showrooming (46% vs. 35% in 2018)

Millennials prefer webrooming

# Mobile Grocery Shopping



## The purchase journey:



What does Internet & digital media add?

- WOM generation
- Positive ones can be used as promotional content
- Negative ones can be used as useful feedbacks
- Behavior-based recommendation
- Customer purchase history becomes “big data”

# How has Internet/digital changed the way we shop?

## Changes in search costs

- Results in larger product assortment and lower prices
- Implications to firms: focus on product differentiation, raising switch cost

## Changes in availability and use of data

- Allows firms to deliver more targeted messages
- Allows users more easily to provide feedback to improve product/service
- Allows users to be affected by others' choices

## Changes in role of geographic proximity

- Reduces the cost of communication with others
- Encourages the use of multiple channels in shopping process
- Offline context still matters in each stage of customer journey

# What is digital marketing?

# What is digital marketing?

*“ Digital Marketing is the use of Internet connected devices and electronic media to engage a customer*

Search advertising

Display advertising

Social media marketing

Recommendation

...

## What is the course about?

Overview of digital technology + Underlying  
Business/Marketing concepts

Aim is not mastery of all the topics, but to give an overview  
of most important topics

The list of topics covered in this course can be found in the  
syllabus.

## Who should take this course?

Undergraduate students

- Learn the basics of digital marketing
- Learn the basics of data analytics
- Already have a background in basic marketing / advertising

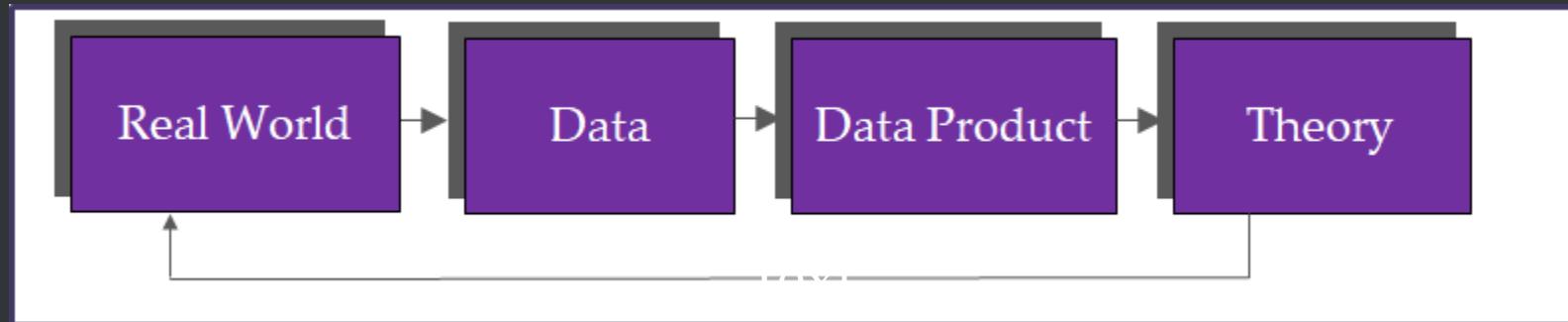
Our class adopts methodologies from...

- Computer Science
- Statistics, and
- Economics

## Leveraging your competitive advantage!

- Compared to traditional marketers, you know how to program and how to analyze data.
- Compared to statisticians and computer scientists, you understand consumers better, and know how to apply results to business settings.
- Compared to economists, you not only know the theory, but also know how to apply the theory to solve real-world marketing problems, and test the theory using real-world data.

## The loop



Talk is cheap, show me the data!

## About me

Xi Li, Professor of Marketing. KKL 836

- PhD in Management, University of Toronto.
- M.Phil. in Operations Research, HKUST.
- B.E. in Computer Science, Tsinghua University.

Director, Asia Case Research Centre

Associate Director, Institute of Digital Economy and Innovation

Research interests: Algorithms, big data and online marketplaces.

# My FT (Financial Times) Chinese Column

专栏 明德商论 [+ 关注](#)

## 自愿数据共享，真的可以保护消费者？

李曦：笔者的研究发现，基于自愿的数据分享更可能会推高产品的价格，进一步损害消费者的权益。

李曦 [+ 关注](#)



更新于2024年8月22日 10:45 李曦

 HKU BUSINESS SCHOOL  
港大經管學院

## Course Website

[https://ximarketing.github.io/\\_pages/teaching/](https://ximarketing.github.io/_pages/teaching/)

Choose class “Digital Marketing”

Password: 24DM

## Grading

Your grades will be determined by the following components:

- Group-level data-analysis task: 15% (No presentation; report needed)
- Group-level research project: 25% (Both in-class presentation and report required)
- In class participation: 10%
- Final examination: 50% (open book open notes, MC questions only)

## Data Analysis

In this course, we are introducing a practice class on data analysis. This is one unique feature of our course.

You have already learned about R and Tableau. Perhaps you can also use many other tools such as SPSS, Excel, Python etc.

I will give you some real digital marketing data, and your goal is to study the data using the tools you know --- It's entirely up to you how you want to play with the data!

## Data Analysis

You are going to work with your teammates on the data project. Then, each group will submit a report illustrating the findings from the data. **It will be graded, and it affects your final grade.**

We will start with the data analysis in the class, and you will finish all the analysis after the class.

The purpose of the data project is to help you understand the data analysis methodologies and gain a sense of real data that data scientists are analyzing everyday.

## Research Project

Good news: Because we already have the data analysis task, you do not need to collect or analyze data in your research project.

What you need to do: Choose a company and analyze the company's digital marketing strategy.

You are free to choose your own company, but make sure that the company is active in digital marketing (at least it should have social media accounts and its own website).

## Things to focus on

Company website: Any issues? What can the company do to improve its website?

Social media (e.g., Facebook, Instagram, Twitter): Is the company managing its social media accounts? Any issues? What would you suggest the company?

Online sentiment: How people are discussing the company or its brands in online review platforms (e.g., TripAdvisor, Amazon)? What's wrong?

## Estimated Workload

Group level:

- Data Analysis Task: 6 hours (+ 3 hours in class exercise)
- Research Project: 12 hours (No data analysis required).

Individual preparation for final: 6 hours

In sum: around 24 hours

## TODO List

If you decide to take this course, here is what you should do after today's class (Important)!

- Form groups with your classmates. Think about the project you are going to work on.
- Individual task: Install R on your laptop. We will be using it in the next class.

## TODO List

Each group consists of at most 6 students (and at least 1).

You need to choose a name for your group, e.g.,  
“Marketers”, “Fantastic”, “A Plus” ...

Submit your group form on Moodle before Sep 16 (Class 1A) or Sep 20 (Class 1B).

Let the TA Yana Lo, ([yanalo@hku.hk](mailto:yanalo@hku.hk)) know if you cannot find a group.

# Class Schedule

There are no classes on the following dates:

Class 1A (Monday):

- Sep 30 (cancelled to make the schedule consistent with class 1B).
- Oct 14 (Reading week)

Class 1B (Friday):

- Oct 11 (Chung Yeung Festival)
- Oct 18 (Reading week)

## Class Schedule

In summary, we have the following classes:

- 1 introduction (today's class)
- 1 data workshop
- 7 regular lectures, and
- 1 class for final presentation of course project

# Overview of Course Content

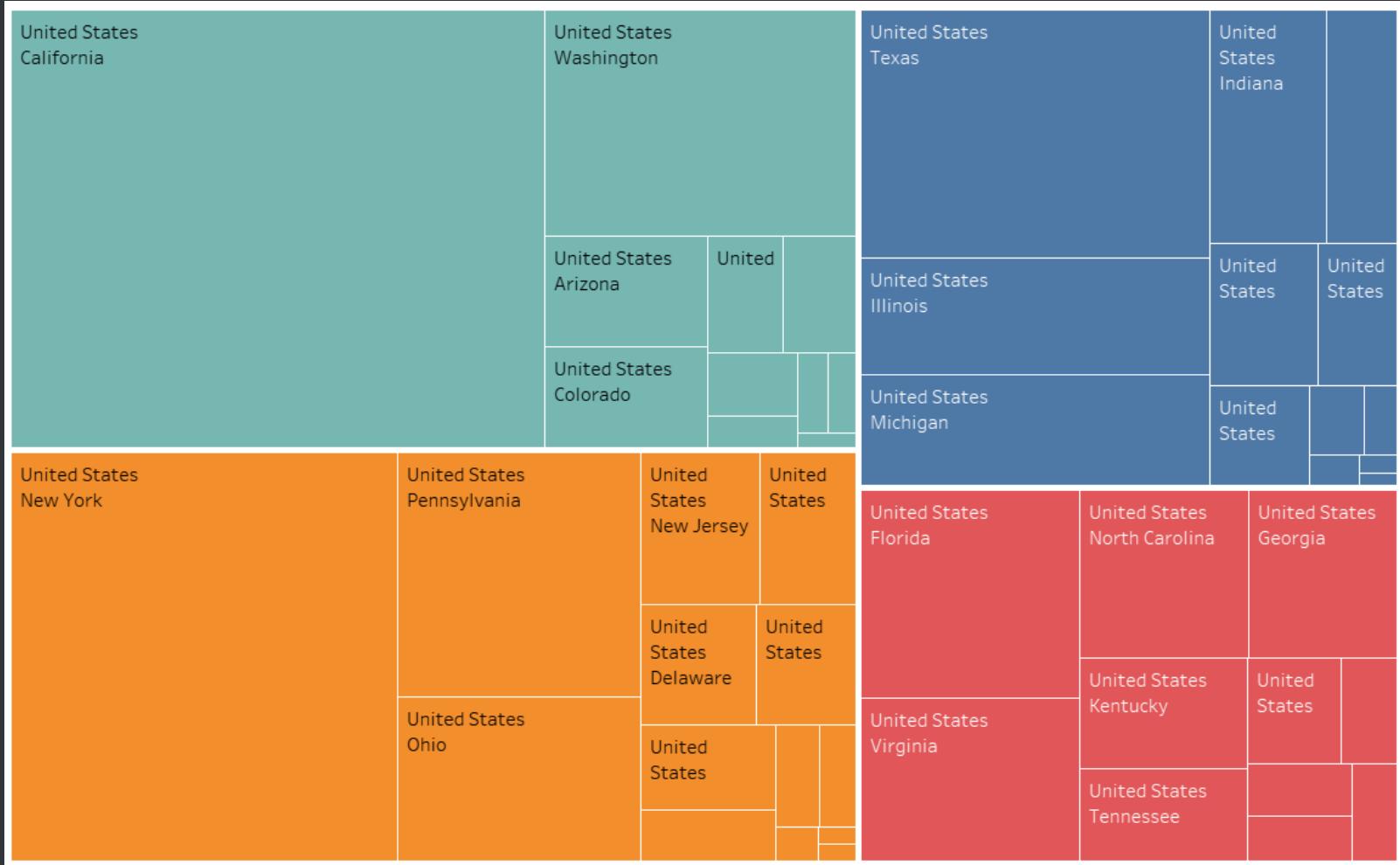
## Data Analytics with R

You can use Excel or SPSS, but they are too simple and cannot handle complex data analysis projects.

R is a free software that is commonly used for statistical analysis.

It is not only useful for digital marketing, but also useful for other purposes such as machine learning and optimization.  
It helps you find a job in the future.

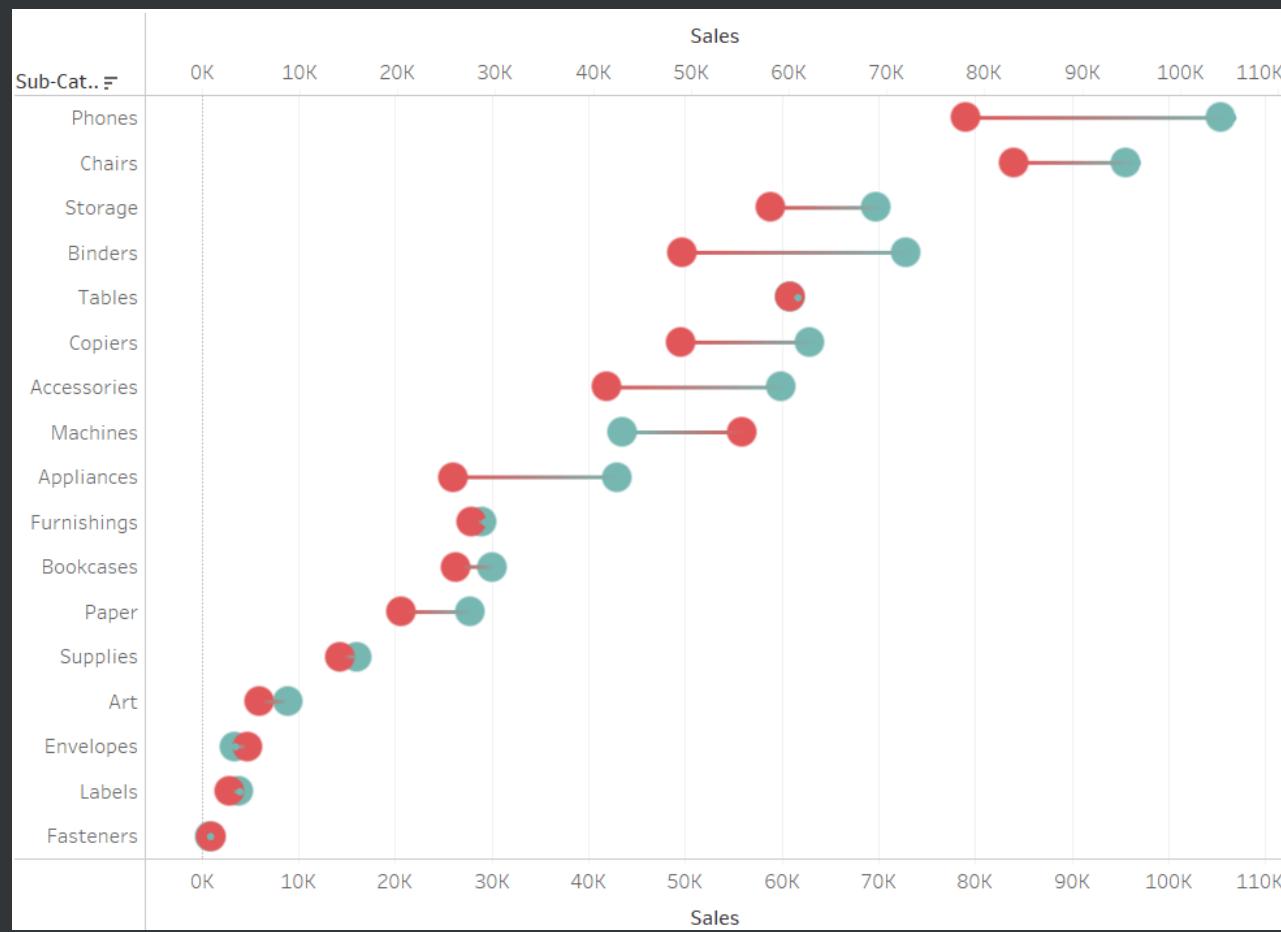
# Data Visualization with Tableau



# Data Visualization with Tableau



# Data Visualization with Tableau



## Webscraping with R

Data scraping allow you to scrawl information from websites, e.g., online marketplaces. For example, you can collect product information from HKTV Mall, weather information from Hong Kong observatory, and tweets from Twitter.

Warning: Do not expect that you can become an expert in data scraping within one class. This is simply an introduction, and you need more practice yourself.

# Webscraping with R

This may be the only web scraping class in a business school (I don't know the answer, though).

We will see how to gather information from HKU faculty webpage:



## Search Engine Optimization

We all know that Google is the most popular search engine (and even the website) over the world.

We are going to address the following questions: (1) How does Google (and other search engines) work? (2) How to improve your page rank on Google, so that consumers can more easily find your website through searching?

## Paid Search

While SEO allows you to improve your page rank for free, you can also spend money to get more attentions from consumers.

We are going to address the following questions: (1) What is online advertising? (2) How does Google sell its search results through auctions? (3) How to buy paid ads? (4) How to develop you keywords list?

# Display Advertising

How to offer targeted ads based on user behavior?

How are displayed ads bought and sold?

What is click fraud?

## Social Network and Mobile Ads

We will discuss ways to take advantage of the social network to engage your users and amplify the influence of your brand.

We will introduce some measures of social networks and use R to process social network data.

We will also discuss some characteristics of mobile marketing.

## Social Media

Setting guidelines and policies for your social media: make sure that you are using social media platforms in a correct way.

Ways to engage your users through social media.

AB testing for social media optimization.

## Recommendation Systems

	Movie 1	Movie 2	Movie 3	Movie 4
Alice	4	4	???	1
Bob		2	2	3
Carol	1	5	3	
Dennis	3		4	1
Emma	5	2	1	4
Flora	3	1		5

# Software

Please download and install R here

Your installation path must NOT contain any non-English characters. Otherwise, you will have troubles using it.

安裝路徑必須為純英文，否則運行可能出錯。

Please download and install RStudio here

Your installation path must NOT contain any non-English characters. Otherwise, you will have troubles using it.

安裝路徑必須為純英文，否則運行可能出錯。

## TODO List

If you decide to take this course, here is what you should do after today's class (Important)!

- Form groups with your classmates. Think about the project you are going to work on.
- Individual task: Install R and RStudio on your laptop. We will be using it in the next class.

## Reminder

Each group consists of at most 6 students (and at least 1).

You need to choose a name for your group, e.g.,  
“Marketers”, “Fantastic”, “A Plus” ...

Submit your group form on Moodle before Sep 16 (Class 1A) or Sep 20 (Class 1B).

Let the TA Yana Lo, ([yanalo@hku.hk](mailto:yanalo@hku.hk)) know if you cannot find a group.