































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>

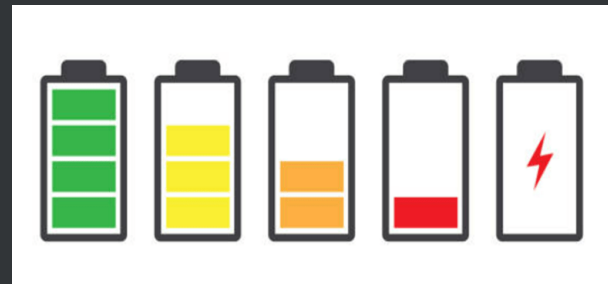
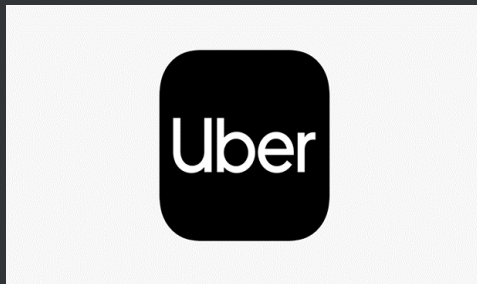
1	 Apple AAPL	HK\$ 26.788 T	HK\$1,762	▲ 0.59%		 USA
2	 Microsoft MSFT	HK\$ 24.244 T	HK\$3,262	▼ 0.61%		 USA
3	 NVIDIA NVDA	HK\$ 23.885 T	HK\$971.01	▲ 1.40%		 USA
4	 Alphabet (Google) GOOG	HK\$ 15.707 T	HK\$1,284	▲ 0.96%		 USA
5	 Amazon AMZN	HK\$ 14.484 T	HK\$1,380	▼ 0.30%		 USA
6	 Saudi Aramco 2222.SR	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

Articles in Advance, pp. 1–25

ISSN 0732-2399 (print) | ISSN 1526-548X (online)



<http://dx.doi.org/10.1287/mksc.2015.0949>

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Credit Scoring with Social Network Data

Yanhao Wei

Department of Economics, University of Pennsylvania, Philadelphia, Pennsylvania 19104, yanhao@sas.upenn.edu

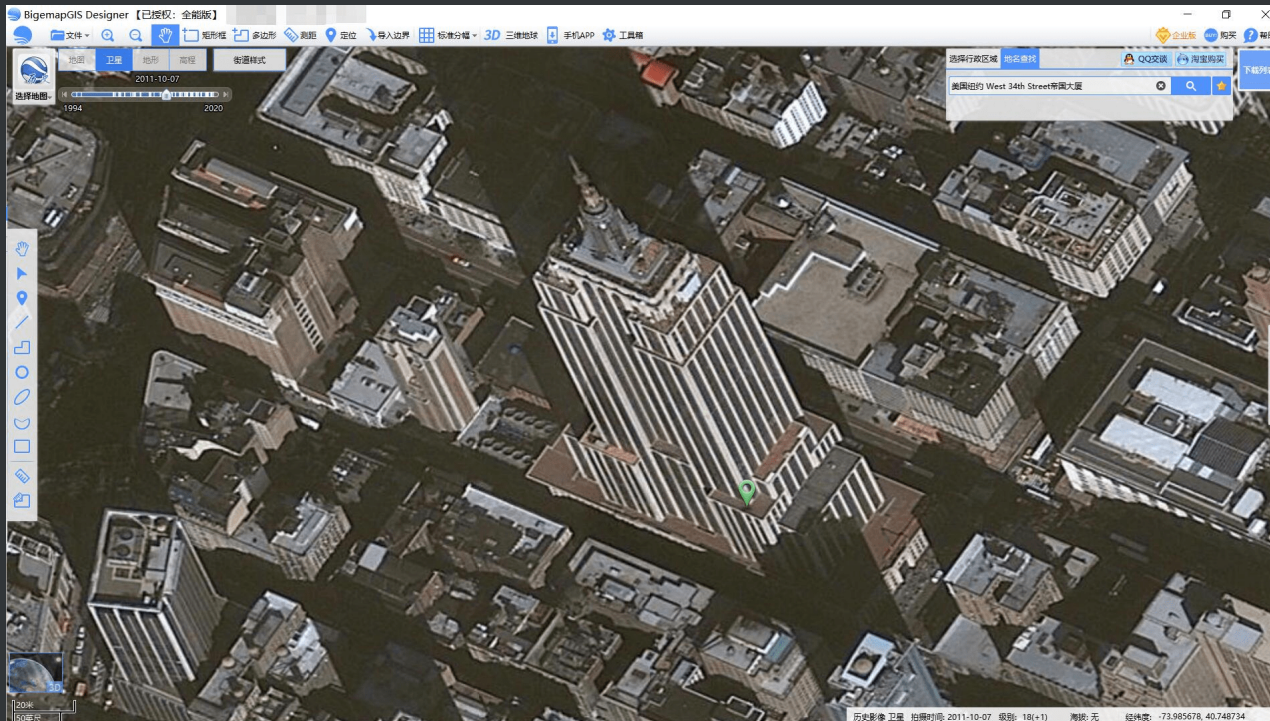
Pinar Yildirim, Christophe Van den Bulte

Marketing Department, The Wharton School, University of Pennsylvania, Philadelphia, Pennsylvania 19104
{pyild@wharton.upenn.edu, vdbulte@wharton.upenn.edu}

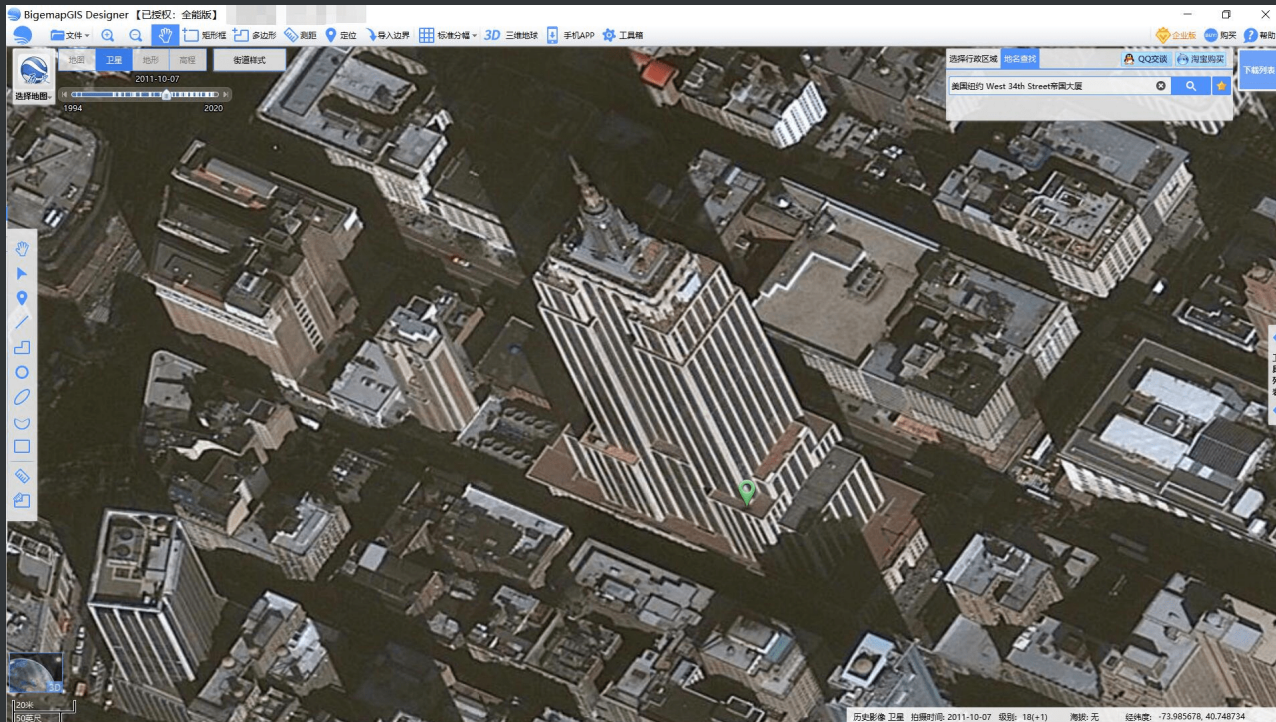
Chrysanthos Dellarocas

Information Systems Department, Questrom School of Business, Boston University, Boston, Massachusetts 02215, dell@bu.edu

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

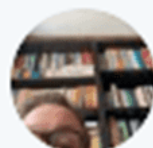
Chinese phone cradle for boosting your phone's daily step count. Some insurance companies in China allow people who consistently reach a certain daily step count to get discounted health insurance premiums.



Lê Nguyễn Hoàng (Science4All) @le_science4all · May 14, 2019

Replying to @mbrennanchina

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



Graeme Douglas ✓ @graemedouglas · May 14, 2019

Replying to @mbrennanchina and @BBHLabs

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





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?

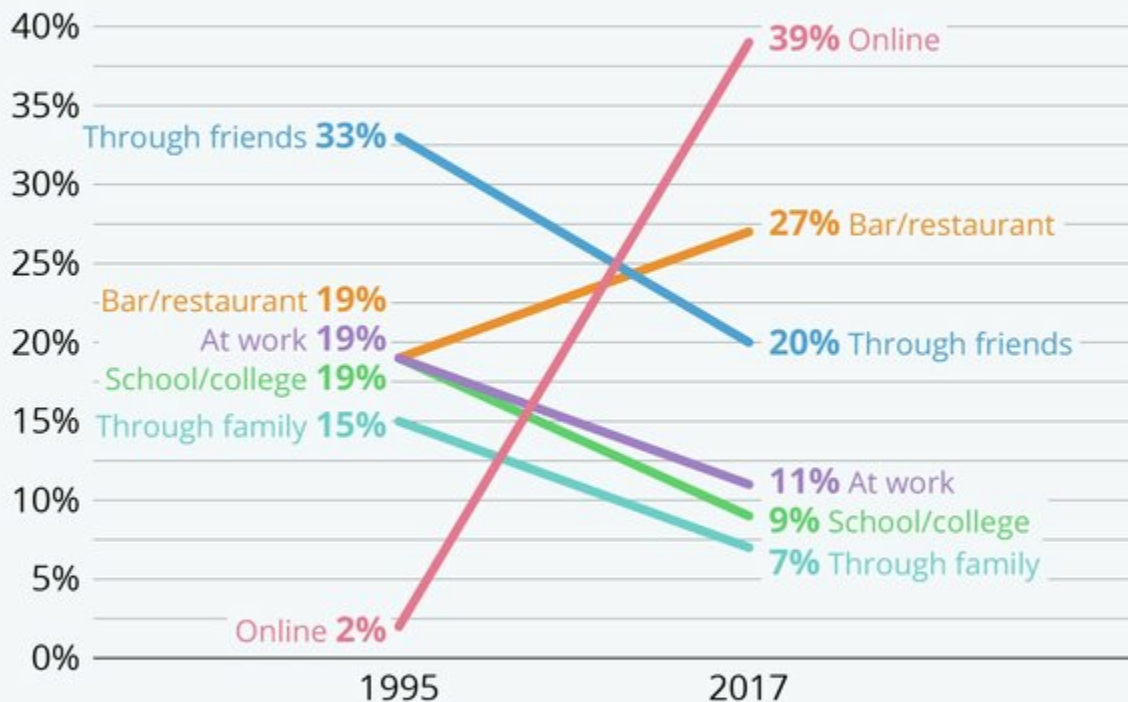
Why do offline sellers offer free Wi-Fi to users?



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

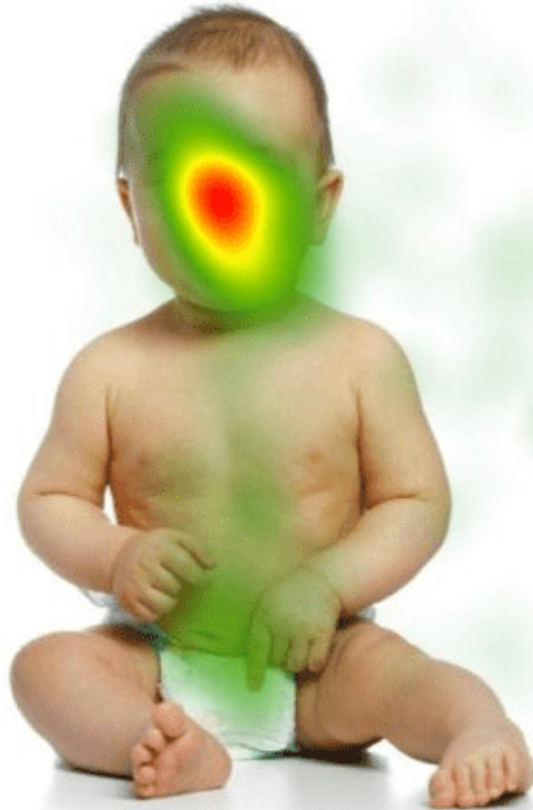
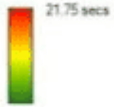


statista

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



Extra gentle for the most sensitive skin.

Sensitive skin + sensitive skin, add the chemicals and moisture of a diaper and you have diaper rash.

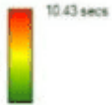
Baby Wipes's unique high-absorbency natural-blend cotton blend provides cotton-soft, extra thick, gel-free protection for your baby's sensitive skin. The chlorine-free materials and absorbent polymers is non-toxic and non-irritating. Clinically tested and pediatrician recommended for babies with allergies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

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

Participant filter: All



Easy to use for the most sensitive skin.

It adds the natural oils and moisture that your baby's skin needs.

It's made with a unique high-absorbency natural-blend cotton pulp that provides cotton-soft, extra thick, gel-free protection for your baby's sensitive skin. The chlorine-free materials and fragrance-free polymers is non-toxic and non-irritating. Clinically proven, a pediatrician recommended for babies with allergies and sensitive skin.



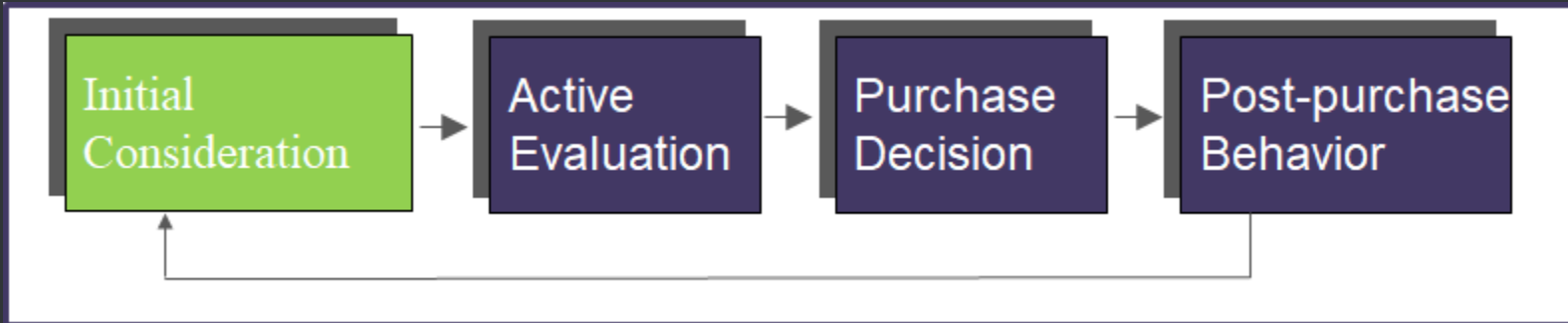
TM

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

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

Dictionary.com definitions

NORDSTROM FREE SHIPPING FREE RETURNS ALL THE TIME.

Word of the Day
eudemonic
pertaining or conducive to happiness. [More...](#)
SIGN UP:
email
f t g+
Previous Words

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

Do You Give Presents or Gifts?

Your Word Wednesday ?
Pick our Word of the Day!

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 [Click here](#)

Dictionary.com Social

Via influencers:

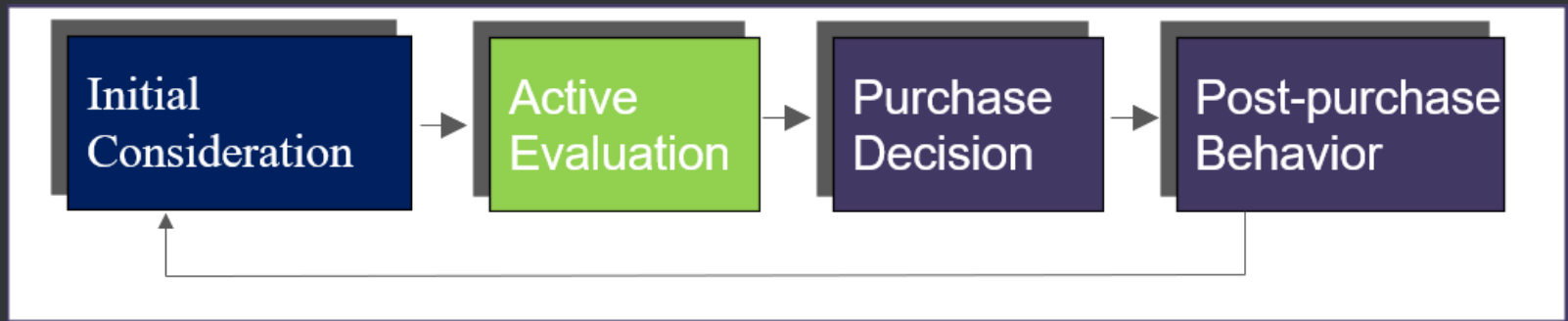
sincerelyjules PHOTO sincerelyjules PHOTO

sincerelyjules sincerelyjules

19176 likes sincerelyjules Happy Sunday! 🍷 We #Célfie tee again! view all 234 comments _julietteee_ @_manue__ canon

21837 likes sincerelyjules Yesterday's easy breeze 💙 view all 293 comments iamxoxoasia @sincerelyjules u have d love to have em 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:

OUR ADVICE
Buy now 
Prices are unlikely to decrease within 7 days 
Track prices OFF

1162 of [1293 flights](#)

Fee Assistant  ^

Carry-on bag 0


Checked bag 0

Stops


Nonstop \$147

1 stop \$154


Cheapest \$147 • 1h 35m

Best  \$147 • 1h 40m




Quickest \$162 • 1h 34m



Other Sort 

Delta® Flights from Raleigh to New York

 Enjoy Free In-Flight Entertainment on Delta Flights. Terms & Bag Fees Apply.
\$162 nonstop
[delta.com](#) | Sponsored

\$162
Delta
[View Deal](#)

Cheapest  Rating: 9  

<input type="checkbox"/>		5:35 am — 7:10 am American Airlines	nonstop	1h 35m RDU - LGA	\$147 Hacker Fare Basic Economy View Deal
<input type="checkbox"/>		1:40 pm — 3:15 pm United Airlines	nonstop	1h 35m EWR - RDU	

Coupons can be found more easily.

The image shows a screenshot of the Honey website's 'Top Deals Today' section. The deals listed are:

- Macy's:** 25% Off BCX Plus Extra 25% with Code PREVIEW. Shop Now at Macys.com! Valid 8/21-8/25! 2,437 uses - \$55.88 avg savings
- JCPenney:** Coupon Code COM278 2,301 uses - \$26.00 avg savings
- Forever21:** Coupon Code WCR 2,140 uses - \$12.29 avg savings

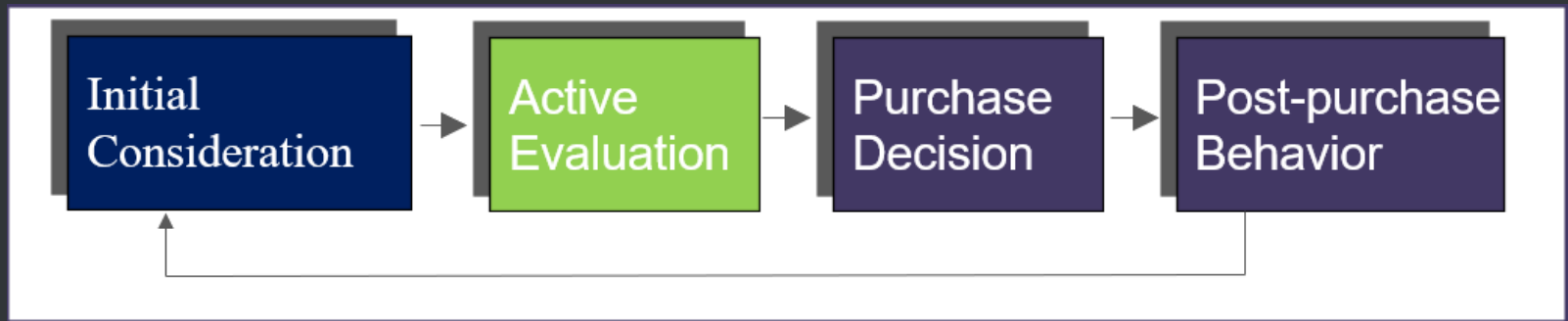
Below the screenshot is a physical red coupon for Macy's 'FRIENDS & FAMILY' sale. The coupon text includes:

- FRIENDS & FAMILY**
- WEDNESDAY, DECEMBER 1 - MONDAY, DECEMBER 6
- WE'RE BRINGING A VERY SPECIAL DISCOUNT WITH YOU!
- AN EXTRA 25% OFF***
- REGULAR SALE & CLEARANCE ITEMS, INCLUDING THE DESIGNER NAMES YOU LOVE!
- EXTRA 25% OFF ELECTRONICS, ELECTRONICS, FURNITURE, HOME TREASURES AND BATHFLOOR COMPARISONS
- GET AN EXTRA 10% OFF ONLINE WHEN YOU SHOP ONLINE AT MACYS.COM. PLUS, GET FREE SHIPPING WITH YOUR ONLINE PURCHASE OF \$49 OR MORE!
- Some items MAY NOT be in the promotional code box at checkout to receive your discount and receive FREE SHIPPING!
- *See restrictions for details and exclusions.

At the bottom of the coupon, it says 'FRIENDS & FAMILY EXTRA 25% OFF' and 'macy's'.

On the right side of the coupon image, there is a photograph of a hand holding a smartphone displaying a coupon. The phone screen shows a red coupon with a barcode. To the right of the phone, there is a sign that says 'Get the coupon. Now in the @ app. Or text TOYS to TOYS to TARGET'. Below the sign, there are two boxes: '\$10 OFF Toys and games purchase of \$50 or more' and '\$25 OFF Toys and games purchase of \$100 or more'.

The purchase journey:

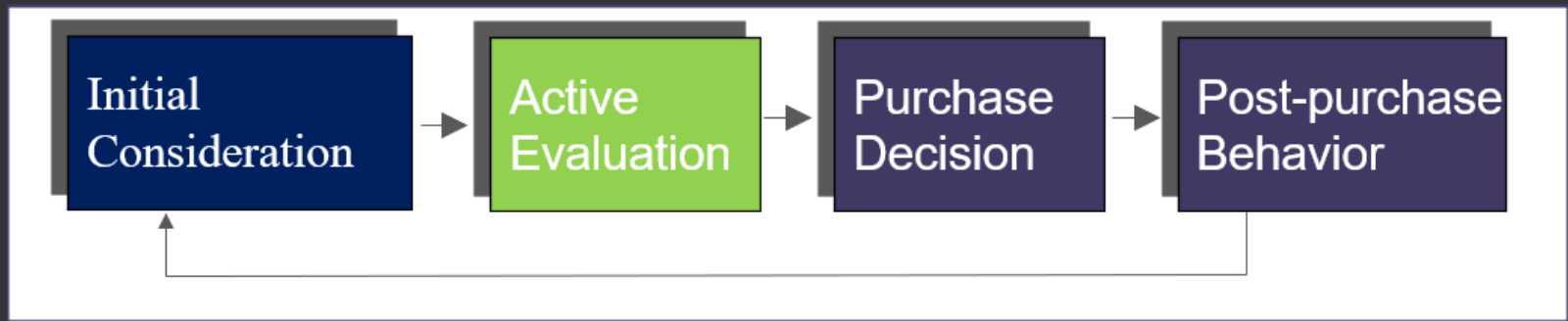


Implications of reduced search costs?

- More competition
- Less brand loyalty

What can firms do to fight against price competition?

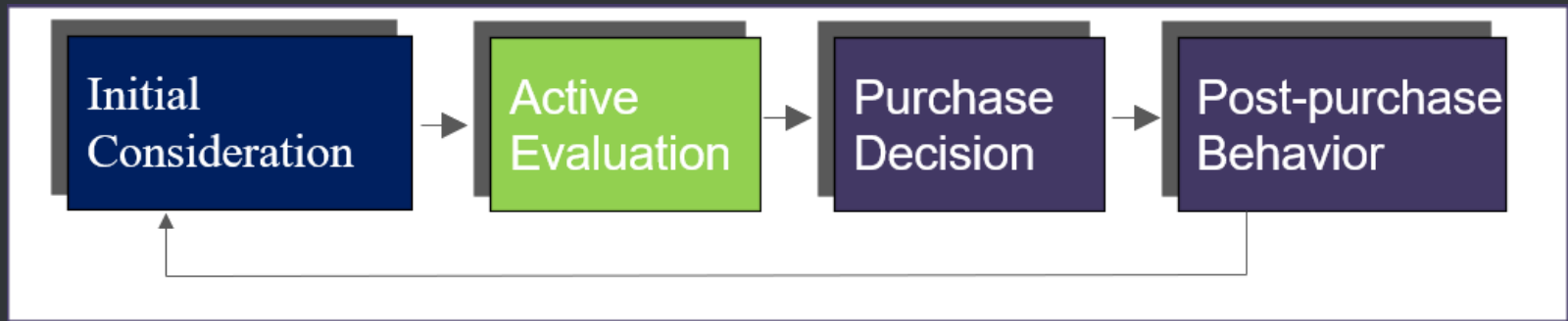
The purchase journey:



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** 116 Old Durham Rd
Chapel Hill, NC 27517
(919) 933-1773
★ ★ ★ ★ ★ 85 reviews
\$\$ - Korean, Japanese


 I went to MinGa for lunch on Monday and was pleased with my experience there. The restaurant serves really authentic Korean and Japanese food, even serving the small cold appetizers that

 **2. Oishii** 1129 Weaver Dairy Rd
Chapel Hill, NC 27514
(919) 932-7002
★ ★ ★ ★ ★ 50 reviews
\$\$ - Sushi Bars, Japanese

 Tasty, but service and price are a little off. I came out here for dinner recently. As a Japanese restaurant/sushi place, it's pricier than most of the other places in Chapel Hill. However

 **3. Akai Hana Japanese Restaurant** 206 W Main St
Carrboro, NC 27510
(919) 942-6848
★ ★ ★ ★ ★ 108 reviews
\$\$ - Japanese, Sushi Bars

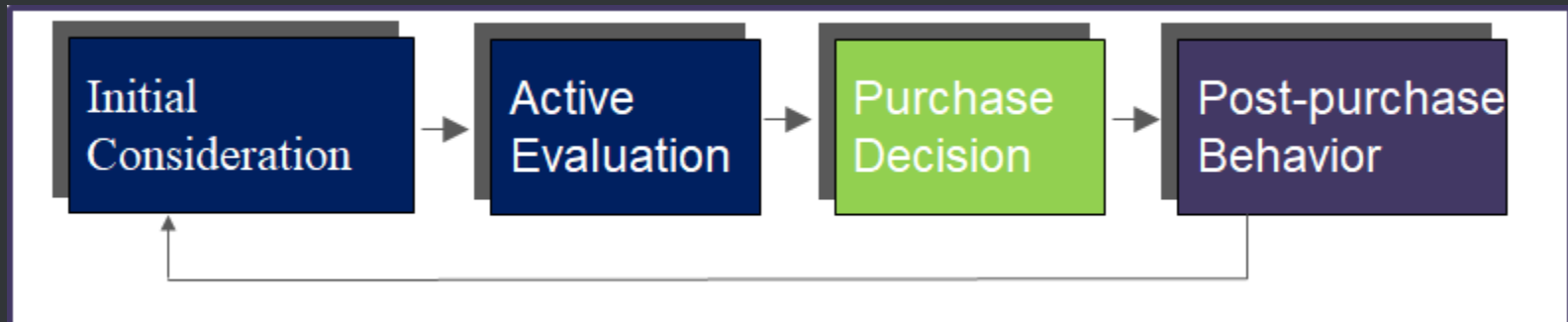
 Very cool place, much more flair for detail and quality than I am used to in a typical Japanese dinner restaurant. NOTE: I can't comment on the sushi because I've never tried that portion

 **4. Sushi Nikko** 104 NC 54
Carrboro, NC 27510
(919) 240-5046
★ ★ ★ ★ ★ 40 reviews
\$\$ - Japanese

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

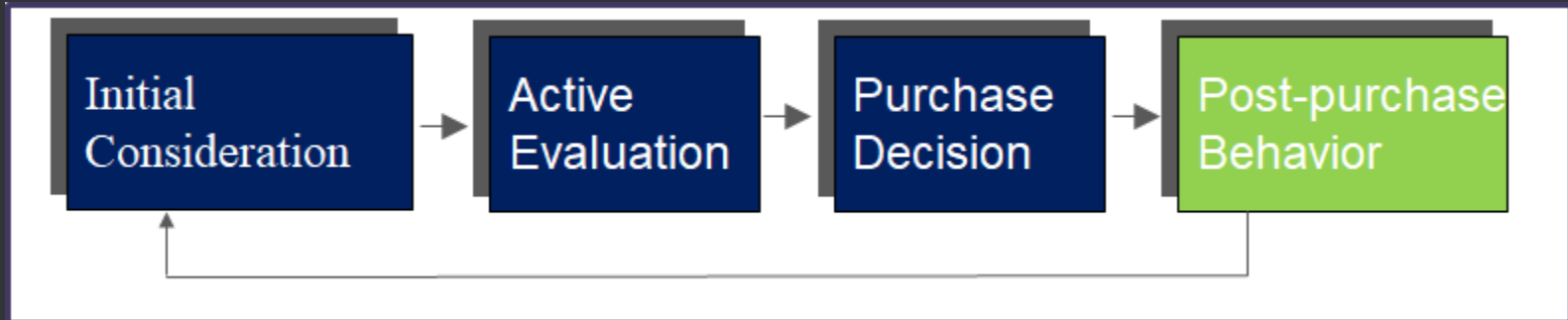
Webrooming is more common than showrooming (46% vs. 35% in 2018)

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

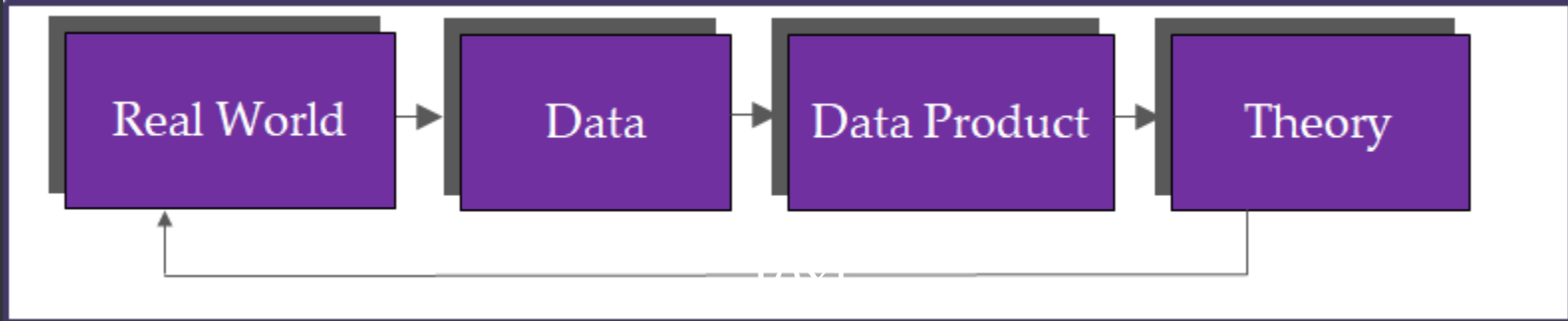
Our class adopts methodologies from...

- 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

Course Website

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)** 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

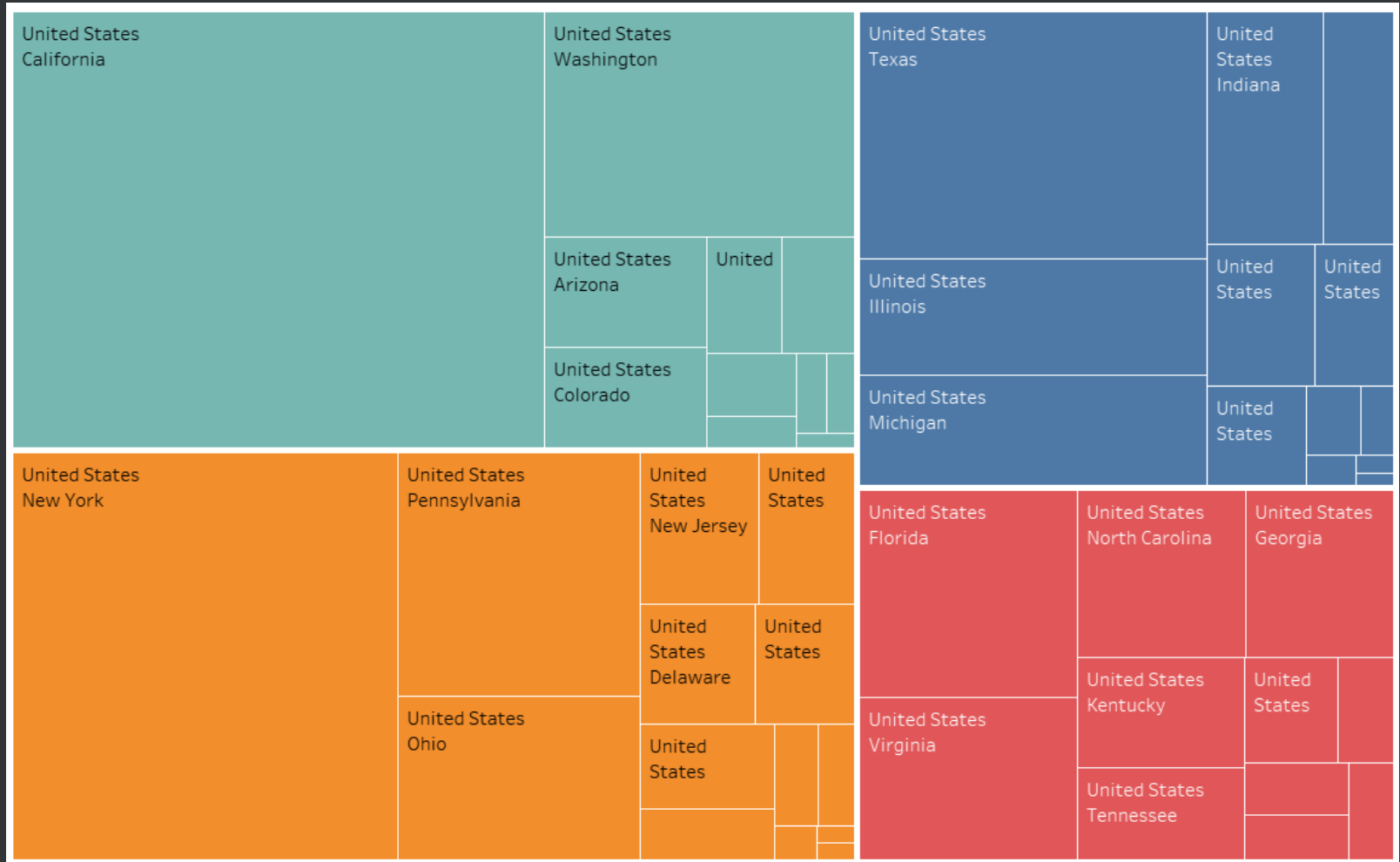
Data Analytics with R

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

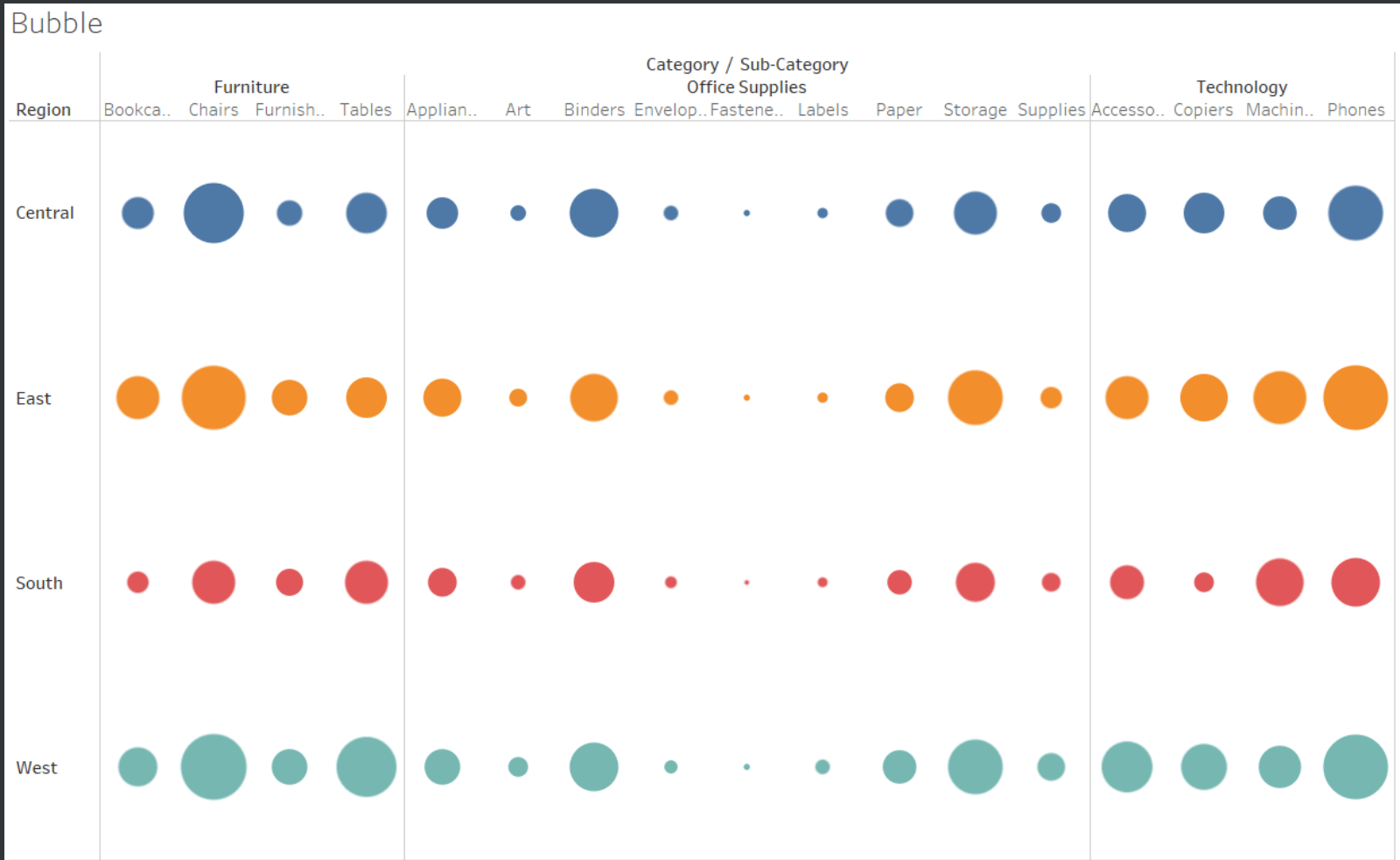
R is a free software that is commonly used for statistical analysis.

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.

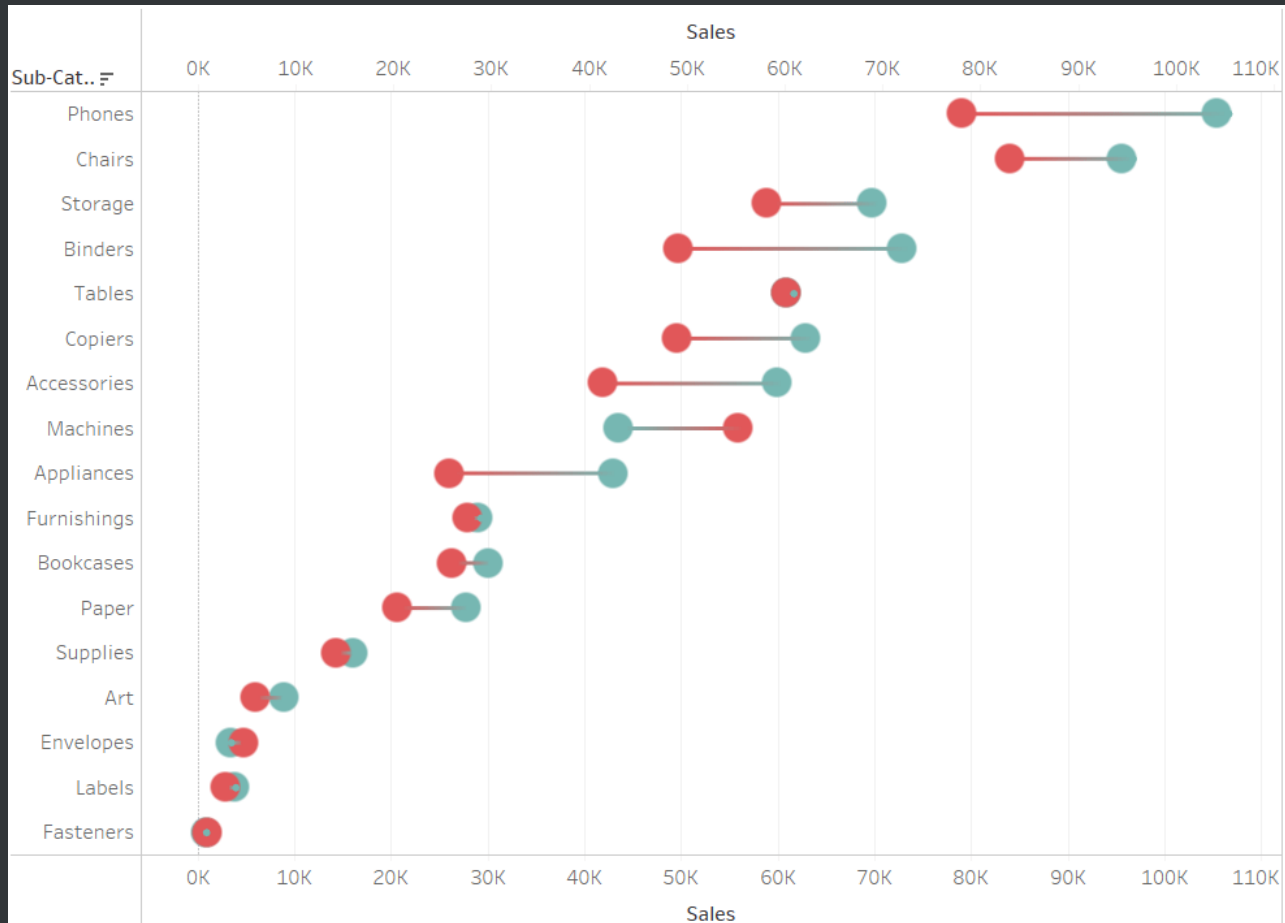
Data Visualization with Tableau



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)** know if you cannot find a group.