E-Marketing

PowerPoint by

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Paris-Dauphine University
Session 4

Social Media
The Timeline

- 1840s – Telephone invented
- 1870s – Commercially available with leased point-to-point service
- Early 1900s – Telephones with exchanges and networks as we know them today
- Mid 1990s to 2001 – First Internet boom
- 2003 – WordPress blogging software
- 2004 – Facebook (300 million members)
- 2005 – YouTube (5 billion video views per month)
Web 2.0

• The popular term for advanced Internet technology and applications, including blogs, wikis, RSS, and social bookmarking.

• One of the most significant differences between Web 2.0 and the traditional www (World Wide Web) is greater collaboration among Internet users and other users, content providers, and enterprises.
REPRESENTATIVE CHARACTERISTICS OF WEB 2.0

— The ability to tap into the collective intelligence of users

— Data is made available in new or never-intended ways

— Web 2.0 relies on user-generated and user-controlled content and data
The old communication model was a monologue.

The new communication model is a dialogue.
Marketing Your Web Site

Traditional Marketing
• Television
• Radio
• Newspapers
• Magazines
• Billboards
• Direct Mail
• Word-of-Mouth

Internet Marketing
• Video sharing web sites
• Blogs, Micro-blogs
• Social Networks
• Widgets
• Search Advertising
• Direct Email
• Word-of-mouth
Only 14% of people trust advertising.

Nelson “Trust In Advertising Report”, October 12

78% of people trust the recommendations of other consumers.

Nelson “Trust In Advertising Report”, October 12
THE WEB 2.0 REVOLUTION, SOCIAL MEDIA, AND INDUSTRY DISRUPTORS

– Users can access applications entirely through a browser
– An architecture of participation encourages users to add value to the application
– A major emphasis on social networks and computing
– Strong support of information sharing and collaboration
– Rapid and continuous creation of new business models
WEB 2.0 COMPANIES AND NEW BUSINESS MODELS

- social media

The online platforms and tools that people use to share opinions, experiences, insights, perceptions, and various media, including photos, videos, and music, with each other.
Social Media Landscape

http://www.fredcavazza.net/2008/06/09/social-media-landscape/
Social Networks

• A social network is a social structure made of nodes which are generally individuals or organizations. It indicates the ways in which they are connected through various social familiarities ranging from casual acquaintance to close familial bonds.

• The term was first coined in 1954 by J. A. Barnes (in: Class and Committees in a Norwegian Island Parish, "Human Relations").

• The maximum size of social networks tends to be around 150 people and the average size around 124 (Hill and Dunbar, 2002).
Books on SN
Disruptors

Companies that introduce a significant change in their industries, thus causing a disruption in normal business operations.
Four Pillars of Social Media Strategy

C²E²

Source: Safko and Brake (2009)
WORLD MAP OF SOCIAL NETWORKS
June 2013

Facebook  QZone  V Kontakte  Odnoklassniki  Cloob  Draugiem

credits: Vincenzo Cosenza vincos.it  license: CC-BY-NC  source: Alexa
Social Network Theory

Social network theory views social relationships in terms of *nodes* and *ties*. Nodes are the individual actors within the networks, and ties are the relationships between the actors. There can be many kinds of ties between the nodes. In its most simple form, a social network is a map of all of the relevant ties between the nodes being studied. The network can also be used to determine the *social capital* of individual actors. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines.
Degrees of Separation and the Global Social Network

- The **small world phenomenon** is the **hypothesis** that the chain of social acquaintances required to connect one arbitrary person to another arbitrary person anywhere in the world is generally short.
Degrees of Separation and the Global Social Network

- The concept gave rise to the famous phrase **six degrees of separation** after a 1967 **small world experiment** by psychologist **Stanley Milgram** which found that two random **US** citizens were connected by at most, six acquaintances.
Degrees of Separation and the Global Social Network

• Current internet experiments continue to explore this phenomenon, including the Ohio State Electronic Small World Project and Columbia's Small World Project.

• As of 2005, these experiments confirm that about five to seven degrees of separation are sufficient for connecting any two people through the internet.
SM Experience

- SM experience is **first hand for Gen X and Gen Y**
  - Boomers experience SM via younger generations

<table>
<thead>
<tr>
<th>Experience</th>
<th>Interest areas</th>
<th>Tools</th>
<th>Knowledge source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gen Y</strong></td>
<td>Solid</td>
<td>Connecting and keeping up to date with ‘friends’, social planning, photo sharing</td>
<td>Many; particularly social networking via Facebook and Twitter</td>
</tr>
<tr>
<td><strong>Gen X</strong></td>
<td>Sound</td>
<td>News and information updates, connecting with friends and family, career planning</td>
<td>Various; particularly professional networking via LinkedIn and news and information websites/blogs and applications</td>
</tr>
<tr>
<td><strong>Boomers</strong></td>
<td>Limited or none</td>
<td>Connecting and sharing with family and friends around the world</td>
<td>Very few; limited knowledge of social networking tools and content building communities but keen to learn</td>
</tr>
</tbody>
</table>
Social Media Strategies

Strategy #1 – “Accessing social Consumers”: Use Social Media as a New Channel to Individuals

- User Reviews
- Social Media Wildfire
- Creating Urgency/Spontaneous Selling

Strategy #2 – “Engaging the Hive”: Get Customers to Mobilize Their Personal Networks

- “Pro-sumer” collaboration
- Influencer-Led Development
- Customers as “Community Organizers”
- “Pass it along” promptions
- Recruiting others/Group Seles

Strategy #3 – “Appealing to Influencers”: Target Influencers Who Can Move the Masses

- Engaging the Advocates
- “Pass it along” promptions

The New Age: “Social retailing”

- “Shopping meets social networks” (Foresee Results, 2010)
  - More than **50% of online shoppers use Facebook**,  
  - 56% of shoppers who interact with social media websites have elected to “friend” or “follow” or “subscribe” to a retailer  
  - 49% of respondents who “friend” or “follow” companies through social media do so to **learn about special deals and options**  
  - 45% of users do it to **learn about products**  
  - 5% use social media primarily for **customer support**

- **However, 60% of retailers do not have a presence on a social networks**...
  
- 85% of Gen Y shoppers participate in social networking  
  (PriceGrabber, 2010)
DECLARE YOUR LIKES

LIKE-MINDED SHOPPING STARTS HERE

LEVI'S + Like

WIN $250
SPRING SHOPPING SPREE
ENTER NOW

AS SEEN IN
FASHION EDITORS LOVE LEVI'S
EXPLORE NOW
Strategy #1 – “Accessing social Consumers”: Use Social Media as a New Channel to Individuals
Strategy #2 – “Engaging the Hive”: Get Customers to Mobilize Their Personal Networks
SUPRÉ Frill Front Singlet - hot or not? xx

Vala Babyy! Vala I love all these clothes they're all so hot!!

Sarah O'Neill I have the shorts in the picture, :)
The major reasons to use or deploy a business social network

- Build better customer relationships
- Improve knowledge management
- Facilitate recruiting and retention
- Increase business opportunities
- Build a community
- Gain expert advice
- Improve trade show experiences
- Improve communication and collaboration
SN

Example from restaurant industry
Top Uses Of Social Media Sites For Restaurants

- Drive traffic to your website
- Announce events and wait time
- Post recipes, photos and video
- Hold contest
- Promote daily specials and discounts
- Give tour of your kitchen
- Customer service and engagement tool
- Hire new employees
Drive Traffic From Social Media Websites To Your Own

Tailgate with Broad Street for easy game day fun

Spend your money on the good seats and leave the tailgating prep to Broad Street!
Broad Street Bakery & Cafe is on Facebook
Sign up for Facebook to connect with Broad Street Bakery & Cafe.

Broad Street Bakery & Cafe

The winner of tonight's Broad Street golf tale, and the winner of 2 day passes (good for any day!) to the Viking Classic is... wait for it... her it comes.... MARK BOSWELL! Congrats MARK! Thanks to everyone who played... it was fun... stay tune... Read More

3 hours ago

Mark Boswell

WOOHOO!!! AWESOME!!!

3 hours ago
Hold Contest: Broad Street

BroadstreetCafe

two of those viking classic tickets currently being given away on facebook http://bit.ly/2qU8Lr one hour to post your tale and win!!

about 5 hours ago from TweetDeck

very special prizes coming next week for twitter winners, ................ think Viking Classic..........................

about 6 hours ago from web

Free viking classic tickets being given away @BravoBuzz facebook page http://bit.ly/1gn0ZE... tell a fun story win at 8:30 TONIGHT!

about 6 hours ago from TweetDeck

Oh -- Just FYI we are 3 fans shy of 2000 on facebook... http://facebook.com/broadst... Bring it!!

about 7 hours ago from Tweetie
Announce and Promote Events

AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge is on Facebook
Sign up for Facebook to connect with AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge.

AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge

Happy Hour: 7 Days a week!
3pm-6pm & 10pm-2am!!

Information
Location:
2550 Nicollet Ave South
Minneapolis, MN, 55404
Phone:
612-813-1200
Mon - Sun:
11:00 am - 2:00 am

AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge
Our special lunch menu features 3 sushi specials - 7 days a week!
Yesterday at 10:55am

 AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge
We're part of a great event on October 29th & 30th "Tasty Eat Street". We've got some great specials planned for the restaurant. Check it out, with more details coming soon!

Tasty Eat Street: The October Excursion
Food | Music | Style
Location: Eat Street
Time: 5:00PM Thursday, October 29th
Announce Wait Time and Next Stop

Kogi BBQ

Aztlan and Verde in front of Yogurtland on La Brea and 3rd! Come get ur midnite meal!!
7 minutes ago from txt

about 3 hours ago from web

Hey oc! Naranja is at k1 anaheim. There is no line. Come & get some kogi!
about 4 hours ago from txt

AZUL in Hollywood @Alife on Cahuenga and Sunset! VERDE hanging out w/ us here as well! Minimal line!
about 5 hours ago from txt

Roya behind Guitar Center in Sherman Oaks! Moorpark and Calhoun! Come get ur Grilled Ham and Cheese w Nopalitos!
about 5 hours ago from txt
AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge is on Facebook
Sign up for Facebook to connect with AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge.

Video
2 of 3 videos See All

on the hunt for a superstar! Servers at the restaurant. Do you think you have what it takes? Know someone who does? Send resumes to rreed@aziarestaurant.com
October 8 at 12:09pm

Marc Cameron Hey Thom! I am in. I will send one over shortly. Thanks, Marcus
October 8 at 12:46pm

AZIA Restaurant | Anemoni Sushi & Oyster Bar | Caterpillar Lounge

Azia Restaurant: Open For Lunch Monday-Saturday
0:54 Added about 7 months ago

Sushi Catering: Lunch 10/06/09
6 new photos
October 6 at 10:44am

Leialoha, Jen, Michelle and 8 others like this.
View all 5 comments

Mishelle My mouth is seriously watering!!
October 6 at 3:13pm

Amber Nicole Flanagan wow that looks so so good! no wonder why i keep coming back there!
October 7 at 6:59am
Post Video, Kitchen Tour, Pictures

RT @ahnomnom: CHECK OUT @GUMBOCART vid by @MIXSTERIOUS :: http://bit.ly/knxlZ
about 15 hours ago from web

RT @Mixsterious: Original @ADOBOHOBO VID BY @MIXSTERIOUS: http://bit.ly/3CDxQu
about 15 hours ago from web

Linda St. Street Food Revival Night http://bit.ly/1mAYa
5:21 PM Oct 13th from twitterfeed

No adobo til the rain goes away. Maybe Thurs but definitely Fri @fabric8 from 6-8 and at the Monkey Club 21st & Bryant @ 10PM.
9:46 AM Oct 13th from web

RT @darshanrangnath: @AdoboHobo are you guys out tonight? We're walking around Mission in search of food! - sorry buddy. Stayed in tonight.
9:54 PM Oct 13th from TweetDeck
Hire New Employees

We’re on the hunt for 2 *SUPERSTAR* servers at the restaurant. Do you think you have what it takes? Know someone who does? Send resumes to rreed@aziarestaurant.com

October 8 at 12:09pm

Marc Cameron Hey Thom! I am in. I will send one over shortly. Thanks, Marcus

October 8 at 12:46pm
Promote Daily Specials and Discounts

RIGHT NOW!!! AT ZEKE'S SMOKEHOUSE in West Hollywood come in for our delicious hickorey smoked bbq and we donate 10% to AIDS WALK LA !!!

8:59 PM Oct 6th from web

TODAY!!! All day...Zeke's in West Hollywood is donating 10% of sales to AIDS WALK LA!!!!!!! Come on in!!!!!!

2:21 PM Oct 6th from web

The Lovely Clare Means will be playing live acoustic music at Zeke's Smokehouse West Hollywood this Sunday from 6pm-9pm!!!!!!!

6:25 PM Sep 26th from web
Food links

October 13th, 2009 · No Comments

Some links that have been sitting around in my bookmarks gathering dust.

Tactical Canned Bacon Will Be “Edible” For 10 Years

Is it ethical to engineer livestock that feel no pain?

Oktoberfest Etiquette

20 Amazing Vintage Alcohol Advertisements

Tags: Food News and Links

→ No Comments
Promote your expertise, products, restaurant

Rick Bayless & Frontera News

Chicago Tribune Reviews XOCO – Read Phil Vettel's Review of XOCO in the Chicago Tribune
Pictures? Fun! RT @xtinaliu: can't wait for dinner tonight at Michael Mina's XIV! I am expecting some good food and fabulous pictures!

RT @nataliedonner: Had such an amazing meal last night @XIV_Restaurant w/@timeskew & friends! So delicious and fun! I got to sleep in too!

YAY!! Happy Birthday to us!! Who's bringing the cupcakes? RT @madwino: Happy Birthday XIV!!
ONLINE SOCIAL NETWORKING: BASICS AND EXAMPLES

– social network analysis (SNA)

The mapping and measuring of relationships and information flows among people, groups, organizations, computers, and other information- or knowledge-processing entities. The nodes in the network are the people and groups, whereas the links show relationships or flows between the nodes. SNAs provide both visual and a quantitative analysis of relationships.
COMMERCIAL ASPECTS OF WEB 2.0 AND SOCIAL NETWORKING APPLICATIONS

• ADVERTISING USING SOCIAL NETWORKS, BLOGS, AND WIKIS
  – Viral (Word-of-Mouth) Marketing
    • viral blogging
      Viral (word-of-mouth) marketing done by bloggers.
  – Classified Ads, Job Listings, and Recruitment
  – Special Advertising Campaigns
  – Mobile Advertising

Source: Turban et al. (2010), Introduction to Electronic Commerce
COMMERCIAL ASPECTS OF WEB 2.0 AND SOCIAL NETWORKING APPLICATIONS

• SHOPPING IN SOCIAL NETWORKS
• FEEDBACK FROM CUSTOMERS: CONVERSATIONAL MARKETING
  – Customer Feedback with Twitter

Source: Turban et al. (2010), Introduction to Electronic Commerce
COMMERCIAL ASPECTS OF WEB 2.0 AND SOCIAL NETWORKING APPLICATIONS

• COMMERCIAL ACTIVITIES IN BUSINESS AND ENTERPRISE SOCIAL NETWORKS
  – Finding and Recruiting Workers
  – Management Activities and Support
  – Training
  – Knowledge Management and Expert Location
  – Enhancing Collaboration
  – Using Blogs and Wikis Inside the Enterprise

Source: Turban et al. (2010), Introduction to Electronic Commerce
EXHIBIT 7.5  Generating Revenue from Web 2.0 Applications

Tenets
- Web as platform
- Beyond single device
- Data as the next “Intel Inside”
- Lightweight models
- Rich user experiences
- Harnessing collective intelligence
- Leverage the long tail

Mashup
- usage fees
- commissions

API
- platform

Rich User Experience
- subscriptions
- advertising

The Internet
- SOA
- WOA
- other API

The Enterprise

= Monetization methods

Source: Turban et al. (2010), Introduction to Electronic Commerce
COMMERCIAL ASPECTS OF WEB 2.0 AND SOCIAL NETWORKING APPLICATIONS

• REVENUE-GENERATION STRATEGIES IN SOCIAL NETWORKS
  – Increased Revenue and Its Benefit

• RISKS AND LIMITATIONS WHEN INTERFACING WITH SOCIAL NETWORKS

• JUSTIFYING SOCIAL MEDIA AND NETWORKING

Source: Turban et al. (2010), Introduction to Electronic Commerce
ENTERTAINMENT WEB 2.0 STYLE: FROM SOCIAL NETWORKS TO MARKETPLACES

• MOBILE WEB 2.0 DEVICES FOR ENTERTAINMENT AND WORK
  – iPhone and Its Clones

Source: Turban et al. (2010), Introduction to Electronic Commerce
Social Media
Word-of-Mouth Marketing
How to Start Buzz

• Identify influential individuals and companies and devote extra effort to them
• Supply key people with product samples
• Work through community influencers
• Develop word-of-mouth referral channels to build business
• Provide compelling information that customers want to pass along

Source: Kotler and Keller (2008)
Word-of-Mouth Marketing

- Person-to-person
- Chat rooms
- Blogs
- Twitter, Plurk
- Facebook
- Youtube

Source: Kotler and Keller (2008)
Elements in the Communications Process

Source: Kotler and Keller (2008)
Field of Experience

Source: Kotler and Keller (2008)
The Communications Process

- Selective attention
- Selective distortion
- Selective retention

Source: Kotler and Keller (2008)
Social Media Marketing

• Scorecard for Social Media
  – 4 - Extremely Valuable
  – 3 - Very Valuable
  – 2 - Somewhat Valuable
  – 1 - Not Very Valuable
  – 0 - No Value

Source: Safko and Brake (2009)
Social Media and the Voice of the Customer

- Listen to the **Voice of the Customer (VoC)**
  - Social media can give companies a torrent of highly valuable customer feedback.
  - Such input is largely free
  - Customer feedback issued through social media is qualitative data, just like the data that market researchers derive from focus group and in-depth interviews
  - Such qualitative data is in digital form – in text or digital video on a web site.

Accenture’s SLOPE Model for Listening to the Social Voice of the Customer

Social Voice of the Customer

- Synchronize
- Listen & Learn
- Optimize & Operationalize
- Personalize & Propagate
- Execution & Expectations

Listen and Learn
Text Mining for VoC

• Categorization
  – Understanding what topics people are talking or writing about in the unstructured portion of their feedback.

• Sentiment Analysis
  – Determining whether people have positive, negative, or neutral views on those topics.

Customers’ Opinions About Operational versus Customer Experience Issues

![Diagram](reactive_reputation_management_diagram)

Social Media Can Help Orchestrate Three Spheres to Influence to Boost a Company’s Innovation Efforts

Word-of-Mouth
Social Media

word of mouth 1.00  social media  7.40

http://www.google.com.tw/trends/?q=word+of+mouth,+social+media&ctab=0&geo=all&date=all&sort=0
Text and Web Mining

• Text Mining: Applications and Theory
• Web Mining and Social Networking
• Mining the Social Web: Analyzing Data from Facebook, Twitter, LinkedIn, and Other Social Media Sites
• Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data
• Search Engines – Information Retrieval in Practice
Web Data Mining
Exploring Hyperlinks, Contents, and Usage Data

1. Introduction
2. Association Rules and Sequential Patterns
3. Supervised Learning
4. Unsupervised Learning
5. Partially Supervised Learning
6. Information Retrieval and Web Search
7. Social Network Analysis
8. Web Crawling
9. Structured Data Extraction: Wrapper Generation
10. Information Integration
11. Opinion Mining and Sentiment Analysis
12. Web Usage Mining

Source: http://www.cs.uic.edu/~liub/WebMiningBook.html
Text Mining

• Text mining (text data mining)
  – the process of deriving high-quality information from text
• Typical text mining tasks
  – text categorization
  – text clustering
  – concept/entity extraction
  – production of granular taxonomies
  – sentiment analysis
  – document summarization
  – entity relation modeling
    • i.e., learning relations between named entities.

http://en.wikipedia.org/wiki/Text_mining
Web Mining

• Web mining
  – discover useful information or knowledge from the Web hyperlink structure, page content, and usage data.

• Three types of web mining tasks
  – Web structure mining
  – Web content mining
  – Web usage mining

Natural Language Processing (NLP)

• Structuring a collection of text
  – Old approach: bag-of-words
  – New approach: natural language processing

• NLP is ...
  – a very important concept in text mining
  – a subfield of artificial intelligence and computational linguistics
  – the studies of "understanding" the natural human language

• Syntax versus semantics based text mining

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems
Opinion Mining and Sentiment Analysis

• Mining opinions which indicate positive or negative sentiments
• Analyzes people’s opinions, appraisals, attitudes, and emotions toward entities, individuals, issues, events, topics, and their attributes.

Opinion Mining and Sentiment Analysis

• Computational study of opinions, sentiments, subjectivity, evaluations, attitudes, appraisal, affects, views, emotions, etc., expressed in text.
  – Reviews, blogs, discussions, news, comments, feedback, or any other documents

Terminology

• Sentiment Analysis is more widely used in industry
• Opinion mining / Sentiment Analysis are widely used in academia
• Opinion mining / Sentiment Analysis can be used interchangeably

Example of Opinion: review segment on iPhone

“I bought an iPhone a few days ago. It was such a nice phone. The touch screen was really cool. The voice quality was clear too. However, my mother was mad with me as I did not tell her before I bought it. She also thought the phone was too expensive, and wanted me to return it to the shop. …”

Example of Opinion: review segment on iPhone

“(1) I bought an iPhone a few days ago.

(2) It was such a nice phone.

(3) The touch screen was really cool.

(4) The voice quality was clear too.

(5) However, my mother was mad with me as I did not tell her before I bought it.

(6) She also thought the phone was too expensive, and wanted me to return it to the shop. ...”
Why are opinions important?

• “Opinions” are key influencers of our behaviors.
• Our beliefs and perceptions of reality are conditioned on how others see the world.
• Whenever we need to make a decision, we often seek out the opinion of others.

In the past,

— Individuals
  • Seek opinions from friends and family

— Organizations
  • Use surveys, focus groups, opinion pools, consultants

Word-of-mouth on the Social media

• Personal experiences and opinions about anything in reviews, forums, blogs, micro-blog, Twitter.

• Posting at social networking sites, e.g., Facebook

• Comments about articles, issues, topics, reviews.

Social media + beyond

• Global scale
  – No longer – one’s circle of friends.

• Organization internal data
  – Customer feedback from emails, call center

• News and reports
  – Opinions in news articles and commentaries

Applications of Opinion Mining

• Businesses and organizations
  – Benchmark products and services
  – Market intelligence
    • Business spend a huge amount of money to find consumer opinions using consultants, surveys, and focus groups, etc.
• Individual
  – Make decision to buy products or to use services
  – Find public opinions about political candidates and issues
• Ads placements: Place ads in the social media content
  – Place an ad if one praises a product
  – Place an ad from a competitor if one criticizes a product
• Opinion retrieval: provide general search for opinions.

Research Area of Opinion Mining

• Many names and tasks with difference objective and models
  – Sentiment analysis
  – Opinion mining
  – Sentiment mining
  – Subjectivity analysis
  – Affect analysis
  – Emotion detection
  – Opinion spam detection

Existing Tools
(“Social Media Monitoring/Analysis")

• Radian 6
• Social Mention
• Overtone OpenMic
• Microsoft Dynamics Social Networking Accelerator
• SAS Social Media Analytics
• Lithium Social Media Monitoring
• RightNow Cloud Monitor

Source: Wiltrud Kessler (2012), Introduction to Sentiment Analysis
Existing Tools
(“Social Media Monitoring/Analysis"")

• Radian 6
• Social Mention
• Overtone OpenMic
• Microsoft Dynamics Social Networking Accelerator
• SAS Social Media Analytics
• Lithium Social Media Monitoring
• RightNow Cloud Monitor

Source: Wiltrud Kessler (2012), Introduction to Sentiment Analysis
http://www.radian6.com/

http://www.youtube.com/watch?feature=player_embedded&v=8i6Exg3Urg0
Sentiment Analysis

• Sentiment
  – A thought, view, or attitude, especially one based mainly on emotion instead of reason

• Sentiment Analysis
  – opinion mining
  – use of natural language processing (NLP) and computational techniques to automate the extraction or classification of sentiment from typically unstructured text
Sentiment detection

• How to interpret features for sentiment detection?
  – Bag of words (IR)
  – Annotated lexicons (WordNet, SentiWordNet)
  – Syntactic patterns

• Which features to use?
  – Words (unigrams)
  – Phrases/n-grams
  – Sentences
Niggie, if i dont jailbreak my iPhone4s, u mean i cant play Street fighter4? wtf @louistekneeq
1 minute ago by Flow__Show

リフォロー100％です！ #Arashi #韓fan #wstcg #板野友美 #followme #アメブロ #kimiboku #ntb #autofollow #apple #mt2 #相互フォロー-の輪 #iphone4s #Arashi #twitter #前田敦子
1 minute ago by designer_sayaka

Rumor has it that #Apple #iPHONE5 will have a 4" screen (compared 2 3.5" in #iPhone4S ), giving direct competition 2...
http://t.co/zslGPXbX
1 minute ago by abhay01007

RT @BallMe_Dollar: The iPhone4S look better then the iPhone5.
1 minute ago by SuckMy_TwitNuts

#iphoneography #iphonography #bahrain #iphone4s #photography #sunrise #scenery #beautiful #sun
http://t.co/Ee4VNimsL
2 minutes ago by thementaldawg
http://www.tweetfeel.com

FAQ | Contact Us

tweetfeel

Search

Try some Twitter trends: Tomorrow is June H&M Defense of Marriage Act Diddy’s Bloomberg UCLA ESPN

40  41  =  51%

Those are all the results available right now. Try again or try another term to see how people feel towards it.
Got questions? Read our FAQ.

RT @jigginjello: This 12 year old has an iPhone4s wtf

So my 9 year old little sister has an iPhone4s. Wtf bruh?!

This 12 year old has an iPhone4s wtf

So my sister has an android and I don't even have a phone and she gets a brand new iPhone4s ___#Wtf

iPhone4s is funny ass a bitch

-Ohwell a new iPhone4s won't hurt, aha
http://www.i-buzz.com.tw/
OpView Service

OpView 服务总览

什么是OpView服务？
OpView是协助您收集、处理、分析网络资讯的云端服务。

OpView服务，犹如提供您无限网络情报能量的充电器。以云端架构为基础，OpView服务协助您收集、处理、分析各类型网络资讯与内容，并以云端服务平台供客户使用。OpView服务的资料涵盖范围包括台湾最具代表性的新闻网站。

http://www.eland.com.tw/solutions

http://opview-eland.blogspot.tw/2012/05/blog-post.html
Applications of Sentiment Analysis

• Consumer information
  – Product reviews

• Marketing
  – Consumer attitudes
  – Trends

• Politics
  – Politicians want to know voters’ views
  – Voters want to know politicians’ stances and who else supports them

• Social
  – Find like-minded individuals or communities
Problem statement of Opinion Mining

- Two aspects of abstraction
  - Opinion definition
    - What is an opinion?
    - What is the structured definition of opinion?
  - Opinion summarization
    - Opinion are subjective
      - An opinion from a single person (unless a VIP) is often not sufficient for action
    - We need opinions from many people, and thus opinion summarization.

Abstraction (1) : what is an opinion?

• Id: Abc123 on 5-1-2008 “I bought an iPhone a few days ago. It is such a nice phone. The touch screen is really cool. The voice quality is clear too. It is much better than my old Blackberry, which was a terrible phone and so difficult to type with its tiny keys. However, my mother was mad with me as I did not tell her before I bought the phone. She also thought the phone was too expensive, ...”

• One can look at this review/blog at the
  – Document level
    • Is this review + or -?
  – Sentence level
    • Is each sentence + or -?
  – Entity and feature/aspect level

Id: Abc123 on 5-1-2008 “I bought an iPhone a few days ago. It is such a nice phone. The touch screen is really cool. The voice quality is clear too. It is much better than my old Blackberry, which was a terrible phone and so difficult to type with its tiny keys. However, my mother was mad with me as I did not tell her before I bought the phone. She also thought the phone was too expensive, …”

What do we see?

– Opinion targets: entities and their features/aspects
– Sentiments: positive and negative
– Opinion holders: persons who hold the opinions
– Time: when opinion are expressed

Two main types of opinions

• **Regular opinions**: Sentiment/Opinion expressions on some target entities
  - **Direct opinions**: sentiment expressions on one object:
    • “The touch screen is really cool.”
    • “The picture quality of this camera is great”
  - **Indirect opinions**: comparisons, relations expressing similarities or differences (objective or subjective) of more than one object
    • “phone X is cheaper than phone Y.” (objective)
    • “phone X is better than phone Y.” (subjective)

• **Comparative opinions**: comparisons of more than one entity.
  - “iPhone is better than Blackberry.”

Subjective and Objective

- **Objective**
  - An objective sentence expresses some *factual information* about the world.
  - “I returned the phone yesterday.”
  - Objective sentences can implicitly indicate opinions
    - “The earphone broke in two days.”
- **Subjective**
  - A subjective sentence expresses some *personal feelings* or *beliefs*.
  - “The voice on my phone was *not so clear*”
  - Not every subjective sentence contains an opinion
    - “I wanted a phone with *good voice quality*”
- ➔ **Subjective analysis**

## Sentiment Analysis vs. Subjectivity Analysis

<table>
<thead>
<tr>
<th>Sentiment Analysis</th>
<th>Subjectivity Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Subjective</td>
</tr>
<tr>
<td>Negative</td>
<td>Objective</td>
</tr>
<tr>
<td>Neutral</td>
<td></td>
</tr>
</tbody>
</table>
A (regular) opinion

• **Opinion** (a restricted definition)
  
  – An opinion (regular opinion) is simply a positive or negative sentiment, view, attitude, emotion, or appraisal about an entity or an aspect of the entity from an opinion holder.

• **Sentiment orientation of an opinion**
  
  – Positive, negative, or neutral (no opinion)

  – Also called:
    
    • Opinion orientation
    • Semantic orientation
    • Sentiment polarity

Entity and aspect

• Definition of Entity:
  – An entity $e$ is a product, person, event, organization, or topic.
  – $e$ is represented as
    • A hierarchy of components, sub-components.
    • Each node represents a component and is associated with a set of attributes of the components

• An opinion can be expressed on any node or attribute of the node

• Aspects(features)
  – represent both components and attribute

Entity and aspect

- Canon S500
  - (picture_quality, size, appearance,...)
- Lens
  - (...)
- battery
  - (battery_life, size,...)

Opinion definition

• An opinion is a quintuple
  \((e_j, a_{jk}, so_{ijkl}, h_i, t_l)\)
where

  – \(e_j\) is a target entity.
  – \(a_{jk}\) is an aspect/feature of the entity \(e_j\).
  – \(so_{ijkl}\) is the sentiment value of the opinion from the opinion holder on feature of entity at time.
    \(so_{ijkl}\) is +ve, -ve, or neu, or more granular ratings
  – \(h_i\) is an opinion holder.
  – \(t_l\) is the time when the opinion is expressed.

Opinion definition

• An opinion is a quintuple

\[(e_j, a_{jk}, s_{ijkl}, h_i, t_l)\]

where

– \(e_j\) is a target entity.
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  – \(s_{ijkl}\) is +ve, -ve, or neu, or more granular ratings
– \(h_i\) is an opinion holder.
– \(t_l\) is the time when the opinion is expressed.

• \((e_j, a_{jk})\) is also called opinion target

Terminologies

• **Entity**: object
• **Aspect**: feature, attribute, facet
• **Opinion holder**: opinion source
• **Topic**: entity, aspect
• **Product features**, political issues

Subjectivity and Emotion

• **Sentence subjectivity**
  – An objective sentence presents some factual information, while a subjective sentence expresses some personal feelings, views, emotions, or beliefs.

• **Emotion**
  – Emotions are people’s subjective feelings and thoughts.

Emotion

• Six main emotions
  – Love
  – Joy
  – Surprise
  – Anger
  – Sadness
  – Fear

Abstraction (2): opinion summary

• With a lot of opinions, a summary is necessary.
  – A multi-document summarization task

• For factual texts, summarization is to select the most important facts and present them in a sensible order while avoiding repetition
  – 1 fact = any number of the same fact

• But for opinion documents, it is different because opinions have a quantitative side & have targets
  – 1 opinion <> a number of opinions
  – Aspect-based summary is more suitable
  – Quintuples form the basis for opinion summarization

An aspect-based opinion summary

<table>
<thead>
<tr>
<th>Cellular phone 1:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect: GENERAL</td>
<td></td>
</tr>
<tr>
<td>Positive:</td>
<td>125</td>
</tr>
<tr>
<td>Negative:</td>
<td>7</td>
</tr>
<tr>
<td>Aspect: Voice quality</td>
<td></td>
</tr>
<tr>
<td>Positive:</td>
<td>120</td>
</tr>
<tr>
<td>Negative:</td>
<td>8</td>
</tr>
<tr>
<td>Aspect: Battery</td>
<td></td>
</tr>
<tr>
<td>Positive:</td>
<td>80</td>
</tr>
<tr>
<td>Negative:</td>
<td>12</td>
</tr>
</tbody>
</table>

Visualization of aspect-based summaries of opinions

Visualization of aspect-based summaries of opinions

Classification Based on Supervised Learning

• Sentiment classification
  – Supervised learning Problem
  – Three classes
    • Positive
    • Negative
    • Neutral

Opinion words in Sentiment classification

• topic-based classification
  – topic-related words are important
    • e.g., *politics, sciences, sports*

• Sentiment classification
  – topic-related words are unimportant
  – **opinion words** (also called **sentiment words**)
    • **that indicate positive or negative opinions** are important,
      e.g., *great, excellent, amazing, horrible, bad, worst*

Features in Opinion Mining

• Terms and their frequency
  – TF-IDF

• Part of speech (POS)
  – Adjectives

• Opinion words and phrases
  – beautiful, wonderful, good, and amazing are positive opinion words
  – bad, poor, and terrible are negative opinion words.
  – opinion phrases and idioms, e.g., cost someone an arm and a leg

• Rules of opinions

• Negations

• Syntactic dependency

A Brief Summary of **Sentiment Analysis** Methods

<table>
<thead>
<tr>
<th>Study</th>
<th>Analysis Task</th>
<th>Method</th>
<th>Level</th>
<th>Nature of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hu and Li, 2011</td>
<td>Polarity</td>
<td>ML (Probabilistic model)</td>
<td>Snippet</td>
<td>Valence</td>
</tr>
<tr>
<td>Li and Wu, 2010</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Phrase</td>
<td>Sum</td>
</tr>
<tr>
<td>Thelwall et al., 2010</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Sentence</td>
<td>Max &amp; Min</td>
</tr>
<tr>
<td>Boiy and Moens, 2009</td>
<td>Both</td>
<td>ML (Cascade ensemble)</td>
<td>Sentence</td>
<td></td>
</tr>
<tr>
<td>Chung 2009</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Sentence</td>
<td></td>
</tr>
<tr>
<td>Wilson, Wiebe, and Hoffmann, 2009</td>
<td>Both</td>
<td>ML (SVM, AdaBoost, Rule, etc.)</td>
<td>Phrase</td>
<td></td>
</tr>
<tr>
<td>Zhang et al., 2009</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Sentence</td>
<td></td>
</tr>
<tr>
<td>Abbasi, Chen, and Salem, 2008</td>
<td>Polarity</td>
<td>ML (GA + feature selection)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Subrahmanian and Refgiato, 2008</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Sentence</td>
<td></td>
</tr>
<tr>
<td>Tan and Zhang 2008</td>
<td>Polarity</td>
<td>ML (SVM, Winnow, NB, etc.)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Airoldi, Bai, and Padman, 2007</td>
<td>Polarity</td>
<td>ML (Markov Blanket)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Das and Chen, 2007</td>
<td>Polarity</td>
<td>ML (Bayesian, Discriminate, etc.)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Liu et al., 2007</td>
<td>Polarity</td>
<td>ML (PLSA)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Kennedy and Inkpen, 2006</td>
<td>Polarity</td>
<td>Lexicon/Rule, ML (SVM)</td>
<td>Phrase</td>
<td>Count</td>
</tr>
<tr>
<td>Mishne 2006</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Phrase</td>
<td>Average</td>
</tr>
<tr>
<td>Mishne 2005</td>
<td>Polarity</td>
<td>ML (SVM)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Popescu and Etzioni 2005</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Phrase</td>
<td></td>
</tr>
<tr>
<td>Efron 2004</td>
<td>Polarity</td>
<td>ML (SVN, NB)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Wilson, Wiebe, and Hwa, 2004</td>
<td>Both</td>
<td>ML (SVM, AdaBoost, Rule, etc.)</td>
<td>Sentence</td>
<td></td>
</tr>
<tr>
<td>Nigam and Hurst 2004</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Chunk</td>
<td>Rule</td>
</tr>
<tr>
<td>Dave, Lawrence, and Pennock, 2003</td>
<td>Polarity</td>
<td>ML (SVM, Rainbow, etc.)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Nasukawa and Yi 2003</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Phrase</td>
<td>Rule</td>
</tr>
<tr>
<td>Yi et al., 2003</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Phrase</td>
<td>Rule</td>
</tr>
<tr>
<td>Yu and Hatzivassiloglou 2003</td>
<td>Both</td>
<td>ML (NB) + Lexicon/Rule</td>
<td>Phrase</td>
<td>Average</td>
</tr>
<tr>
<td>Pang, Lee, and Vaithyanathan 2002</td>
<td>Polarity</td>
<td>ML (SVM, MaxEnt, NB)</td>
<td>Snippet</td>
<td></td>
</tr>
<tr>
<td>Subasic and Huettner 2001</td>
<td>Polarity</td>
<td>Lexicon/Fuzzy logic</td>
<td>Phrase</td>
<td>Average</td>
</tr>
<tr>
<td>Turney 2001</td>
<td>Polarity</td>
<td>Lexicon/Rule</td>
<td>Phrase</td>
<td>Average</td>
</tr>
</tbody>
</table>

(Both = Subjectivity and Polarity; ML= Machine Learning; Lexicon/Rule= Lexicon enhanced by linguistic rules)

Word-of-Mouth (WOM)

• “This book is the best written documentary thus far, yet sadly, there is no soft cover edition.”

• “This book is the best written documentary thus far, yet sadly, there is no soft cover edition.”

Datasets of Opinion Mining

- Blog06
  - 25GB TREC test collection
  - [http://ir.dcs.gla.ac.uk/test collections/access to data.html](http://ir.dcs.gla.ac.uk/test collections/access to data.html)

- Cornell movie-review datasets

- Customer review datasets

- Multiple-aspect restaurant reviews
  - [http://people.csail.mit.edu/bsnyder/naacl07](http://people.csail.mit.edu/bsnyder/naacl07)

- NTCIR multilingual corpus
  - NTCIR Multilingual Opinion-Analysis Task (MOAT)

Lexical Resources of Opinion Mining

• SentiWordnet
  – http://sentiwordnet.isti.cnr.it/

• General Inquirer
  – http://www.wjh.harvard.edu/~inquirer/

• OpinionFinder’s Subjectivity Lexicon
  – http://www.cs.pitt.edu/mpqa/

• NTU Sentiment Dictionary (NTUSD)
  – http://nlg18.csie.ntu.edu.tw:8080/opinion/

• Hownet Sentiment
## Example of SentiWordNet

<table>
<thead>
<tr>
<th>POS</th>
<th>ID</th>
<th>PosScore</th>
<th>NegScore</th>
<th>SynsetTerms</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>00217728</td>
<td>0.75</td>
<td>0</td>
<td>beautiful#1</td>
<td>delighting the senses or exciting intellectual or emotional admiration; &quot;a beautiful child&quot;; &quot;beautiful country&quot;; &quot;a beautiful painting&quot;; &quot;a beautiful theory&quot;; &quot;a beautiful party“</td>
</tr>
<tr>
<td>a</td>
<td>00227507</td>
<td>0.75</td>
<td>0</td>
<td>best#1</td>
<td>(superlative of `good') having the most positive qualities; &quot;the best film of the year&quot;; &quot;the best solution&quot;; &quot;the best time for planting&quot;; &quot;wore his best suit“</td>
</tr>
<tr>
<td>r</td>
<td>00042614</td>
<td>0</td>
<td>0.625</td>
<td>unhappily#2 sadly#1</td>
<td>in an unfortunate way; &quot;sadly he died before he could see his grandchild“</td>
</tr>
<tr>
<td>r</td>
<td>00093270</td>
<td>0</td>
<td>0.875</td>
<td>woefully#1 sadly#3 lamentably#1 deplorably#1</td>
<td>in an unfortunate or deplorable manner; &quot;he was sadly neglected&quot;; &quot;it was woefully inadequate“</td>
</tr>
<tr>
<td>r</td>
<td>00404501</td>
<td>0</td>
<td>0.25</td>
<td>sadly#2</td>
<td>with sadness; in a sad manner; &quot;`She died last night,' he said sadly&quot;</td>
</tr>
</tbody>
</table>
An integrated example

- Tropicana rolled out repackaging using findings from their social media tactics.

- [http://www.youtube.com/watch?v=6wCG3ZjkwTY](http://www.youtube.com/watch?v=6wCG3ZjkwTY)