Mining Opinion from Twitter

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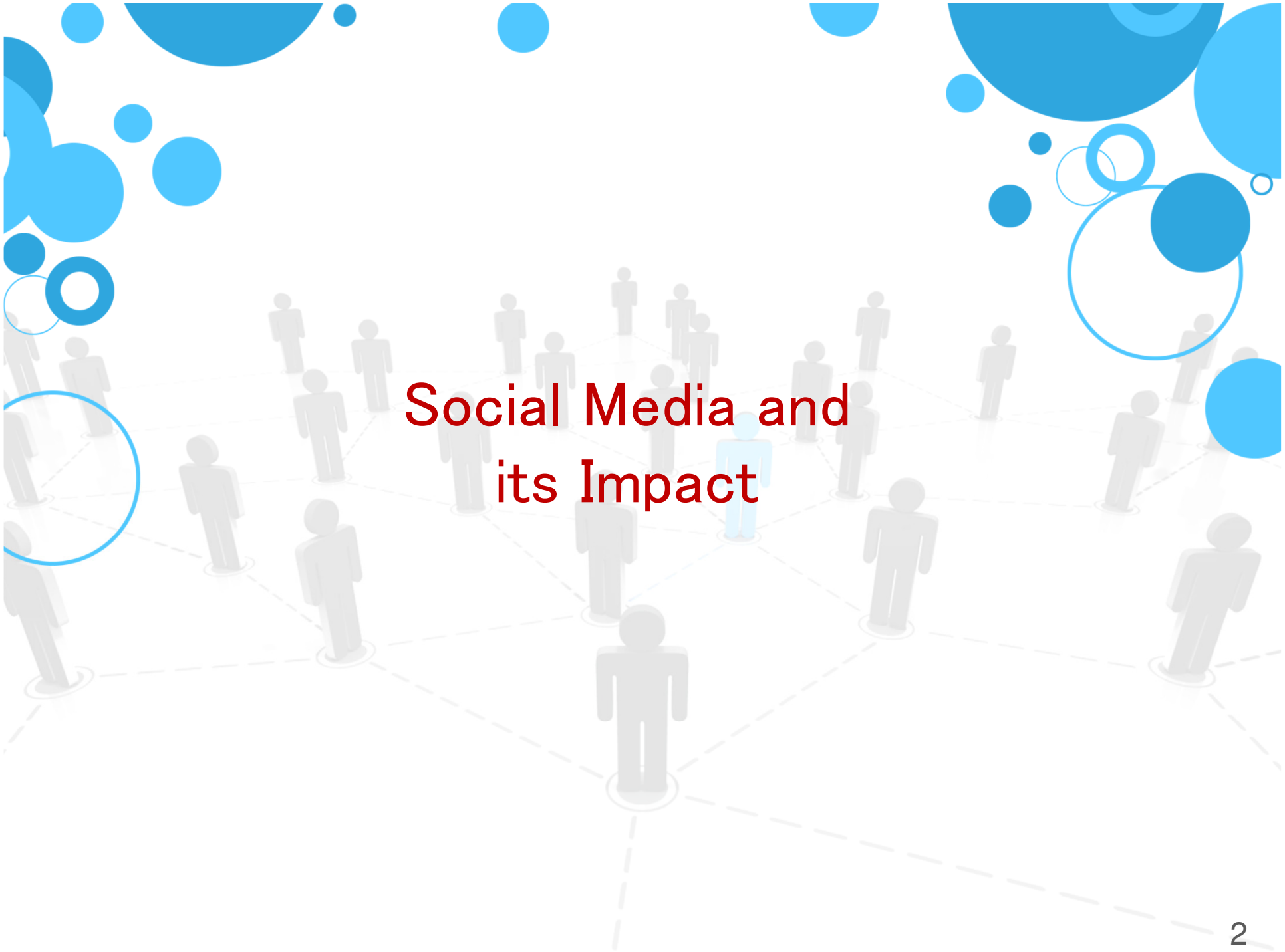
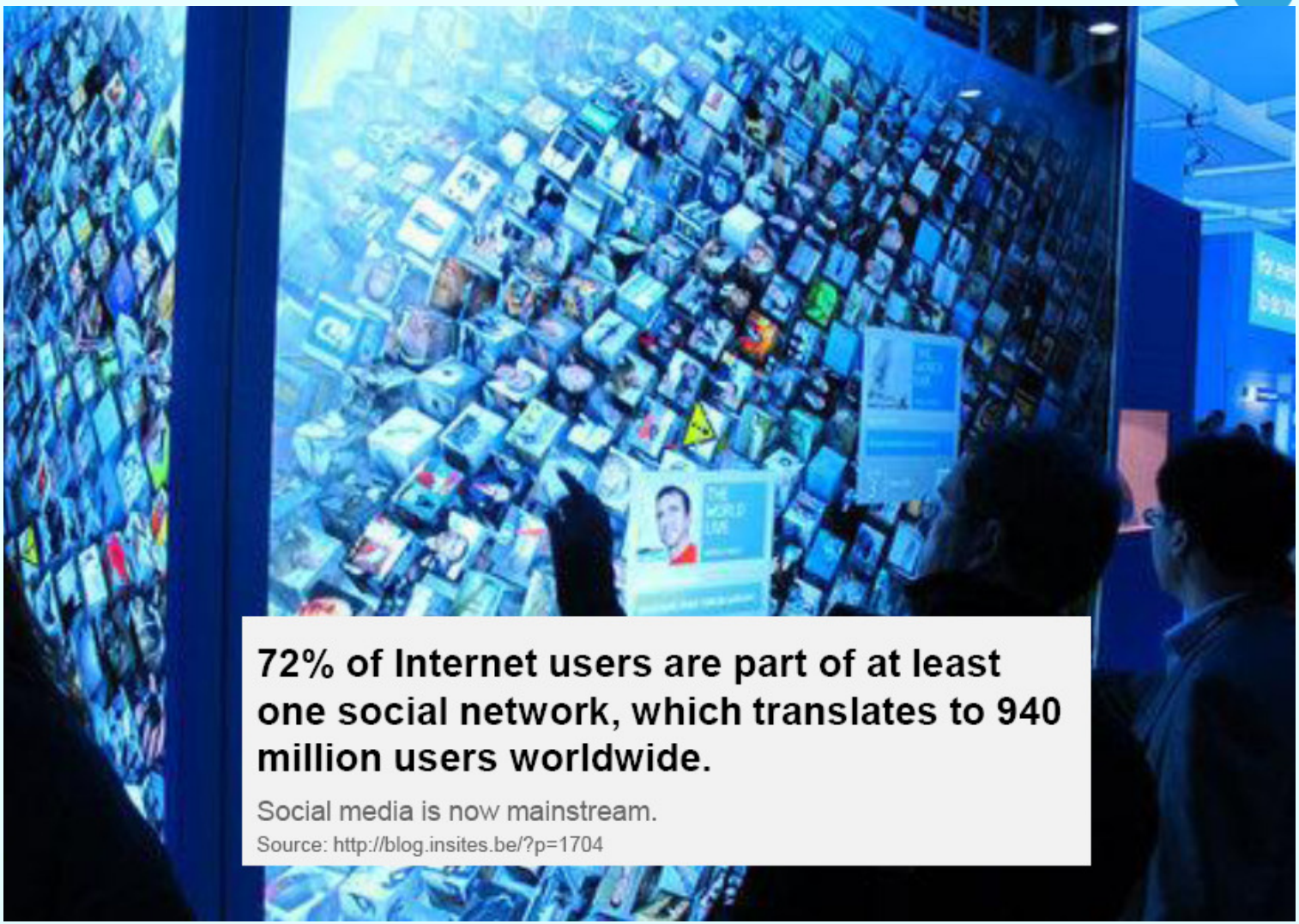
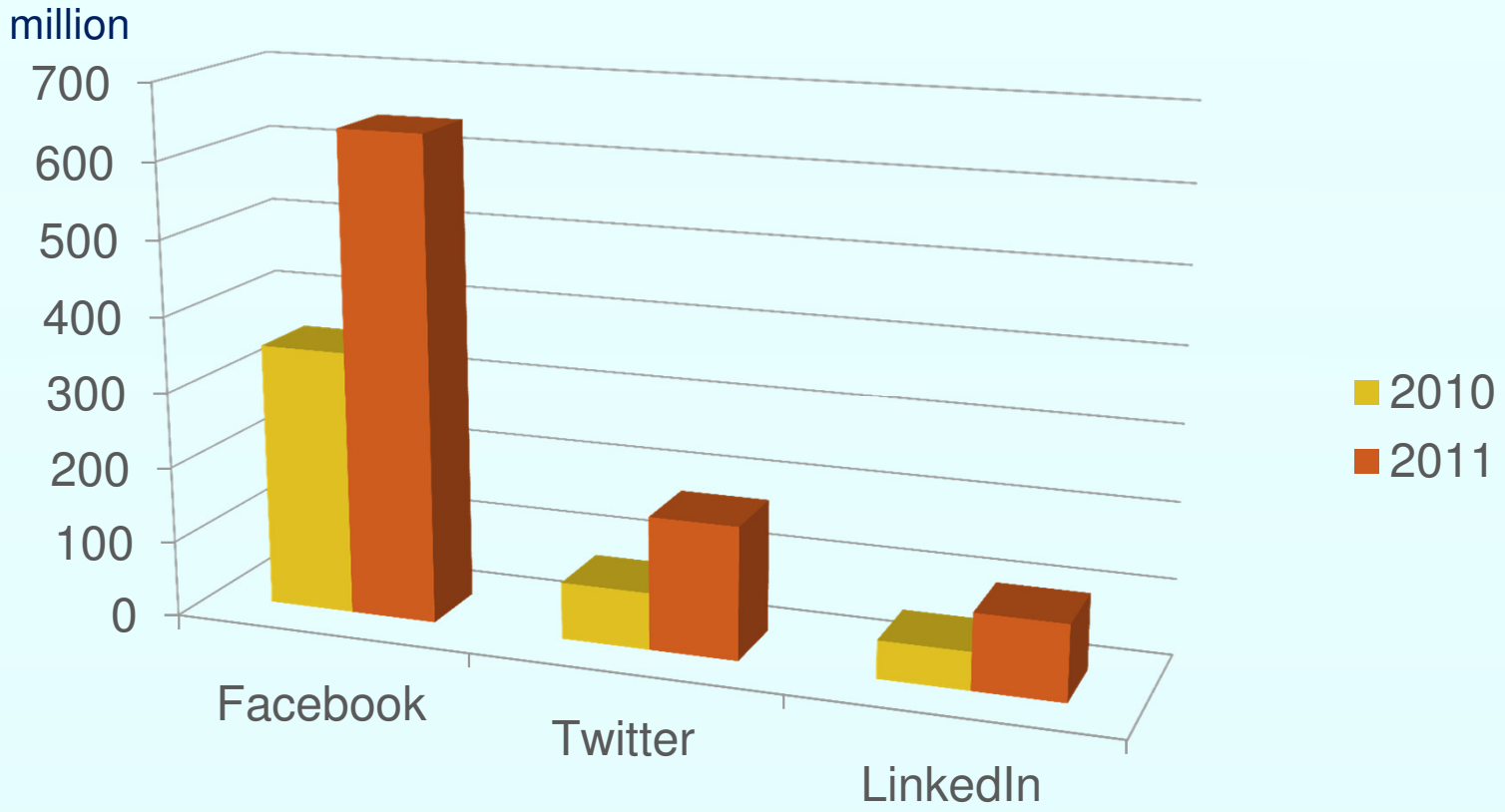


Social Media and its Impact

How Big is Social Media?



Social Media Growth



http://www.browsermedia.co.uk/2011/03/30/2011-social-media-statistics-show-huge-growth/

Social Media

Lots more sharing, talking and opinions!

More than 75 percentage of businesses using social media

- 14 Jul 2011 by BusinessWire *

Majority of Fortune 100 companies using more than one social media platforms

- 17 Feb 2011 by Burson Marsteller **

Landscape

"Social Media Marketing Spending to Hit $3.1 Billion by 2014 (faster than any other form of online marketing)"

Forrester, 15 September 2009

"Only 14% of people trust advertisers yet 78% of consumers trust peer recommendations."

Erik Qualman's book Socialnomics, 2009

Impact of Social Media

Impact of Social Media on Product

GM Cancels 'Hideous' Buick SUV After Would-Be Customers Twitter!

ONE week after announcing a new Buick SUV Christopher Barger, GM's spokesman for social media said:

> The decision was based on customers' input - Face-to-face, blogs and tweets. No matter how they expressed it "they just didn't like it."

http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aHsoNjdHUQLY

Impact of Social Media on Product

GM Cancels ‘Hideous’ Buick SUV After Would-Be Customers Twitter!

Impact of Social Media on Product

- Del Monte created a new "hot-selling" dog food snack in 6 weeks
- Used a **social community to source for creative ideas** and create a new product
- Demonstrates the potential power of social media marketing to influence product sales

http://www.youtube.com/watch?v=yP_3bpCPZaQ

Impact of Social Media on Organisation

Nestlé vs Greenpeace

Palm Oil from Destroyed Rainforest

- Nestlé persuaded YouTube to remove Greenpeace's video
- Storm ensued on Nestlé Facebook page
- TWO months later, Nestlé announced a "zero deforestation" policy in partnership with The Forest Trust (TFT)

"Social media: as you can see we're learning as we go. Thanks for the comments."

Impact of Social Media on Organisation

Nestlé vs Greenpeace
Palm Oil from Destroyed Rainforest

Impact of Social Media on Government

25th Jan 2011
Egypt Blocked Twitter and Facebook!

Egyptian protesters have openly thanked social media's role in the revolution against the country's ruling government.

Impact of Social Media on Government

12th August 2011

Herald Sun
Stories start here.

Meanwhile, British Prime Minis
the option to disable social me

Speaking in parliament, Mr Ca
violence after nights of riots a
street mayhem erupting again

Mr Cameron told MPs he was
houses to round up suspects

He said the government, polic
on the use of social media sit
spread disorder.

August 12, 2011

THE HUFFINGTON POST
UNITED KINGDOM

Gordon MacMillan GET UPDATES FROM GORDON MACMILLAN
Social media editor, Brand Republic Group

FAN RSS EMAIL twitter Like 1

In the Riot Clean-up Social Media shows Itself as a Force of Social Good

Posted: 10/8/11 10:06 GMT

Social Media Analytics

Data and Metrics

Peter Drucker:

"That which is not measured is not managed."

Quantitative Metrics
vs
Qualitative Metrics

Key Measurement Goals

Reach & Buzz

aka getting attention….

Reach

- Size of your audience
  - How many saw your message
- E.g. Twitter followers
  - Just implies popularity?

Buzz

- 2 types:
  - Conversation Focus vs. Content Focus

Identifying Influence

aka getting respect….

Reach & Buzz: Subscribers, Readers, Fans

Influence: REPEATERS

Your message is valuable when it is repeated

aka “Honourable mentions”

High probability of others referencing & reproducing what you say

E.g. Twitter: reply/mention (@xxx) & retweet (RT)

Recognising Sentiment

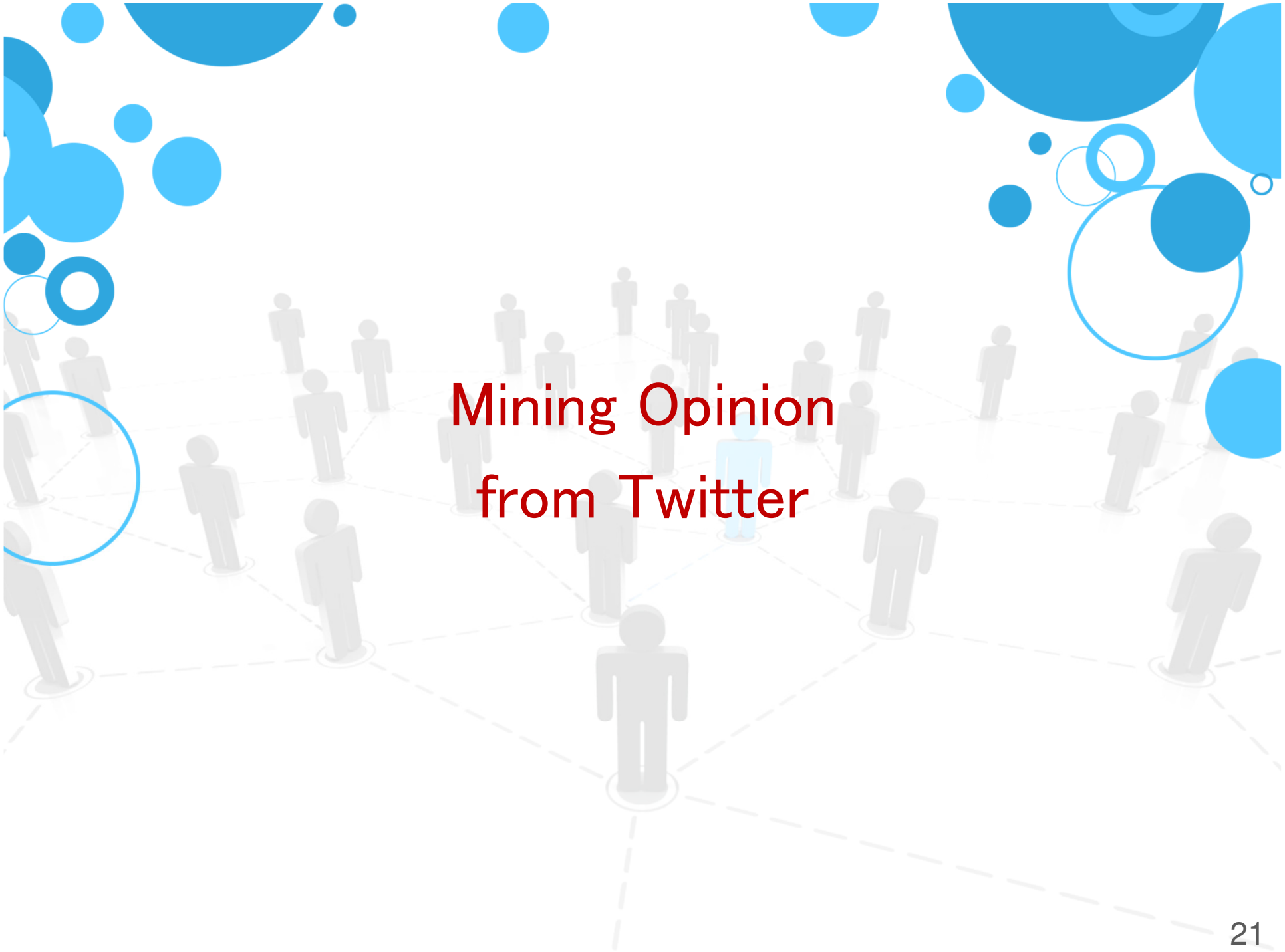
aka getting emotional….

Polarity

Positive, Negative or Neutral

Intensity

Degree of emotion -- !!!!



Mining Opinion from Twitter

Background

- Singapore Government National Funded Project
- Objective
  - Research and develop better algorithms in addressing the accuracy in sentiment analysis and discovering the underlying online relationship for influential study
  - Capability development for staff and students

The platform and data

Twitter - one of the fastest growing social media platforms – 200 millions users and growing…

- 2007 – 0.5 million
- 2009 – 58 million
- 2011 – 200 million

It is open and influential – to company and even country.

Jan 26, 2011

The latest on Twitter in Egypt

04:54 PM Share 7 Yahoo! Buzz Share Print

By Jon Swartz, USA TODAY

1 Comments

2 Recommend

Twitter has acknowledged it is being blocked in Egypt because of massive protests in that economically battered country arranged through social-media sites like it and Facebook.

Influential Analysis

Retweet and the Reply features of Twitter is used to enable real-time study

$$\text{Influential Index} = \frac{n(\text{Reply}) + n(\text{Retweet})}{n(\text{Tweet})}$$

For example, a tweet - `Verizon will launch iPhone 4 on 10 Feb` sent by user `ABC`

Retweet (think of it as forwarding)

```
RT @ABC Verizon will launch iPhone 4 on 10 Feb
```

Reply

```
@ABC thanks… I will be there to get one
```

Sentiment Analysis

- Twitter only allows 140 characters message
- Information shared can be
  - Factual
    - `Verizon will launch iPhone 4 on 10 Feb`
  - Advertisement
    - `Win an iPad2 by visiting this website`
  - Opinions
    - `Verizon iPhone 4 has the same short battery life as AT&T, no improvement`
    - `I can't wait to get my hand on an iPhone 4… yippee`

Challenges

Complexity of human language

Taken in whole context-

> "'Sinful' is a good thing when applied to chocolate cake."

> "Great!!!! It rained! What should we do now?"

Contextual sentiment (*for example, double negative is positive in English*) and the role of content-word negator (*for example,* `eliminated` *has negative sentiment*)

Human expression – every generation and/or culture use different way to express (*for example,* `LOL`)

Implementation

Sentiment Analysis

A *combination approach* using Support Vector Machine [SVM](sigmoid kernel), SentiWordNet and key phrases is implemented

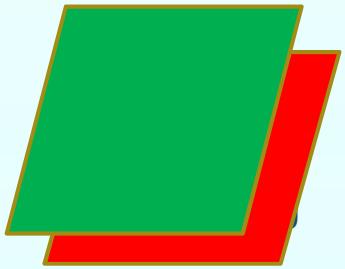
SVM – common approach in sentiment analysis

SentiWordNet – built on WordNet and annotate with positivity, negativity (e.g., '`better`' *has a more positive value than* '`good`')

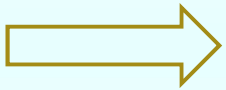
Key phrases – list of positive and negative word(s) extracted from internet (e.g., `looking forward to`, `fallen behind`)

Support Vector Machine

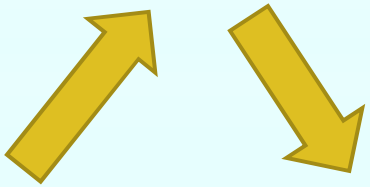
1. Build a model



Positive and negative tweets dataset



Support Vector Machine (SVM) Model



This is not good

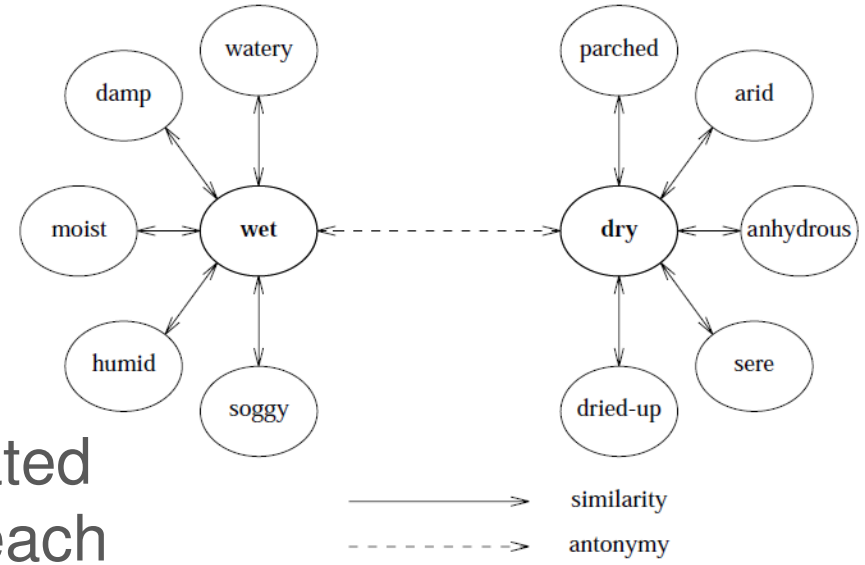
Tweet to be classified

negative

SentiWordNet

WordNet : English nouns, verbs and adjectives are organised into synonym sets, each representing a concept.

SentiWordNet : add a value to the polarity. *For example,* `watery` *has a higher value than* `damp`



A SentiWordNet accumulated value will be assigned to each tweet to decide the polarity

Key Phrases

Examples of

- positive key phrases : `like it, interesting, =)`
- Negative key phrases : `irritating, fallen behind, =(`

Contextual sentiment: `not not good` => `good`

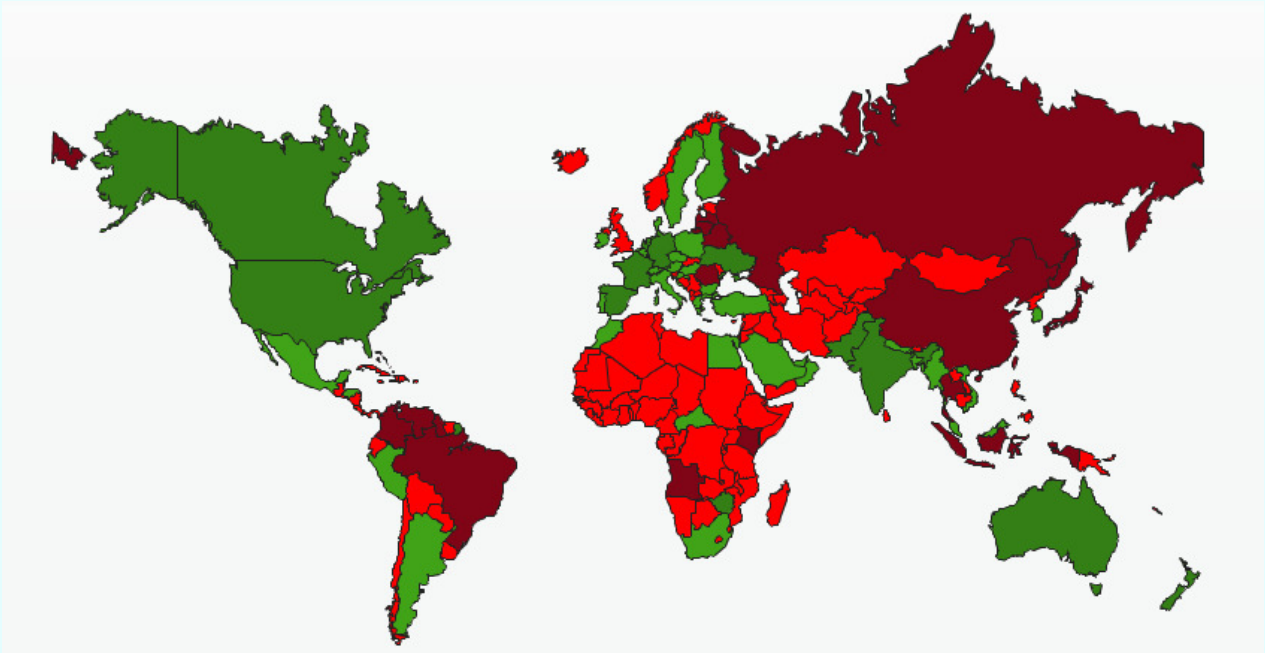
Negator : `not, doesn't, won't` etc

Content-word negator : `eliminate, only`

Geographical Analysis

Using IBM ILOG Elixir visualisation components (heat map and vector map) on world map

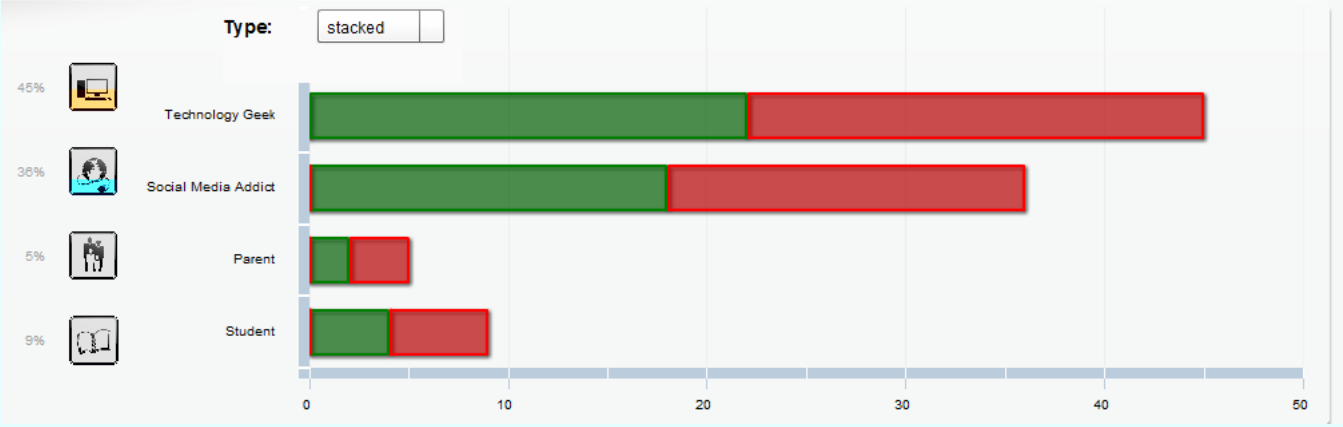
Combine with sentiment analysis



User Category Analysis

Using biodata from twitter user account and key phrases matching to do user categorisation

Combine with influential and sentiment analysis



Verizon iPhone Case Study

The Verizon iPhone4 launch in US was used in assessing the sentiment analysis and influential study algorithms (30 Nov 2010 to 22 Feb 2011 [12 weeks]).

Keyword: Verizon

Event: News of Verizon iPhone launch

Event Timeline:

7 Jan 2011 : Verizon says that it will make an announcement on 11 Jan. Many speculated that it is related to iPhone launch.

11 Jan 2011 : Verizon announces that iPhone 4 will be launched in early Feb.

10 Feb 2011 : iPhone 4 available from Verizon.

Influential Analysis

Top 3 influencers:

Wall Street Journal followed by 2 Verizon official twitter accounts

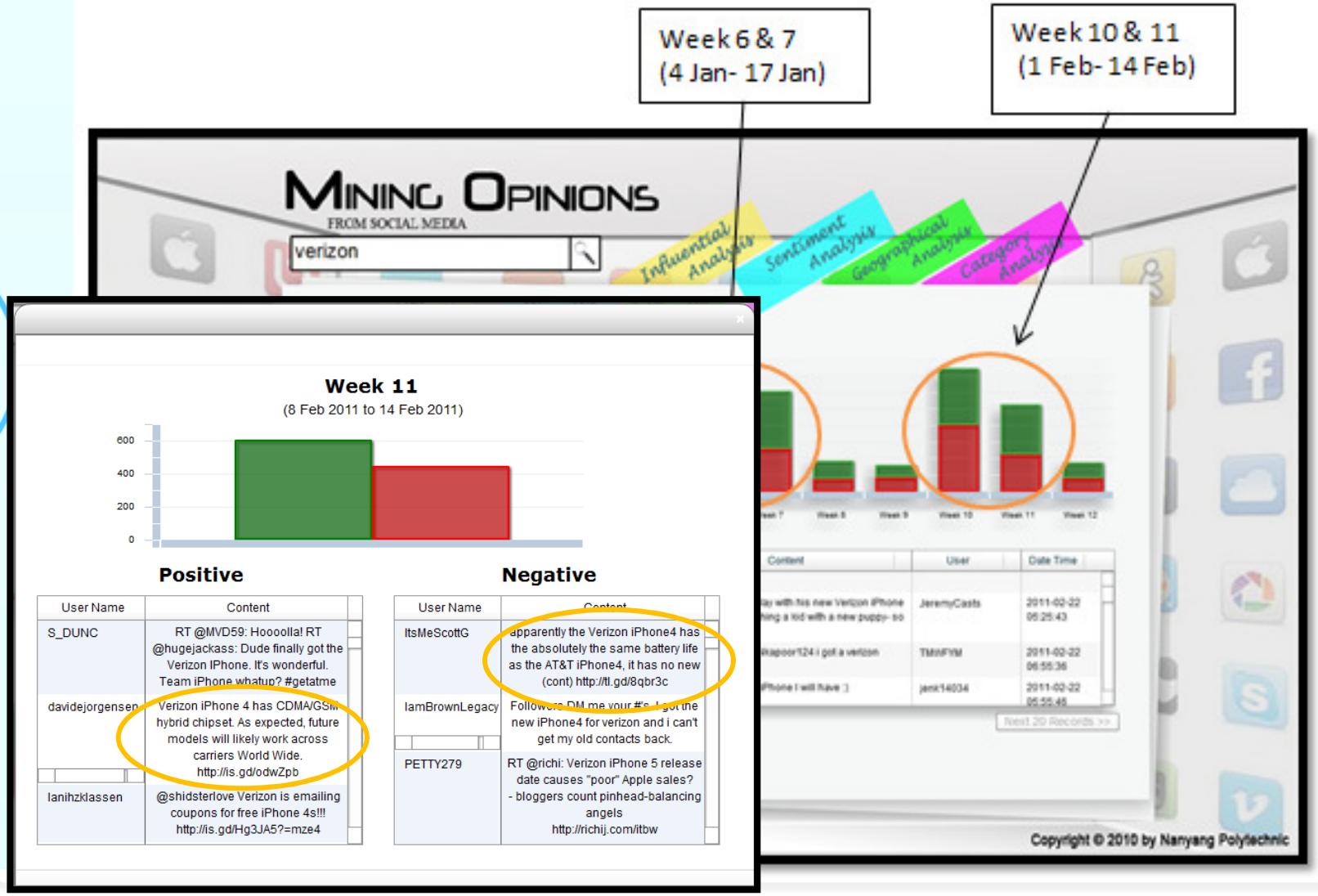
Verizon

TechCrunch Review: The Name's iPhone. Verizon iPhone http://tcrn.ch/f6KLZa (via @techcrunch)

Verizon Wireless

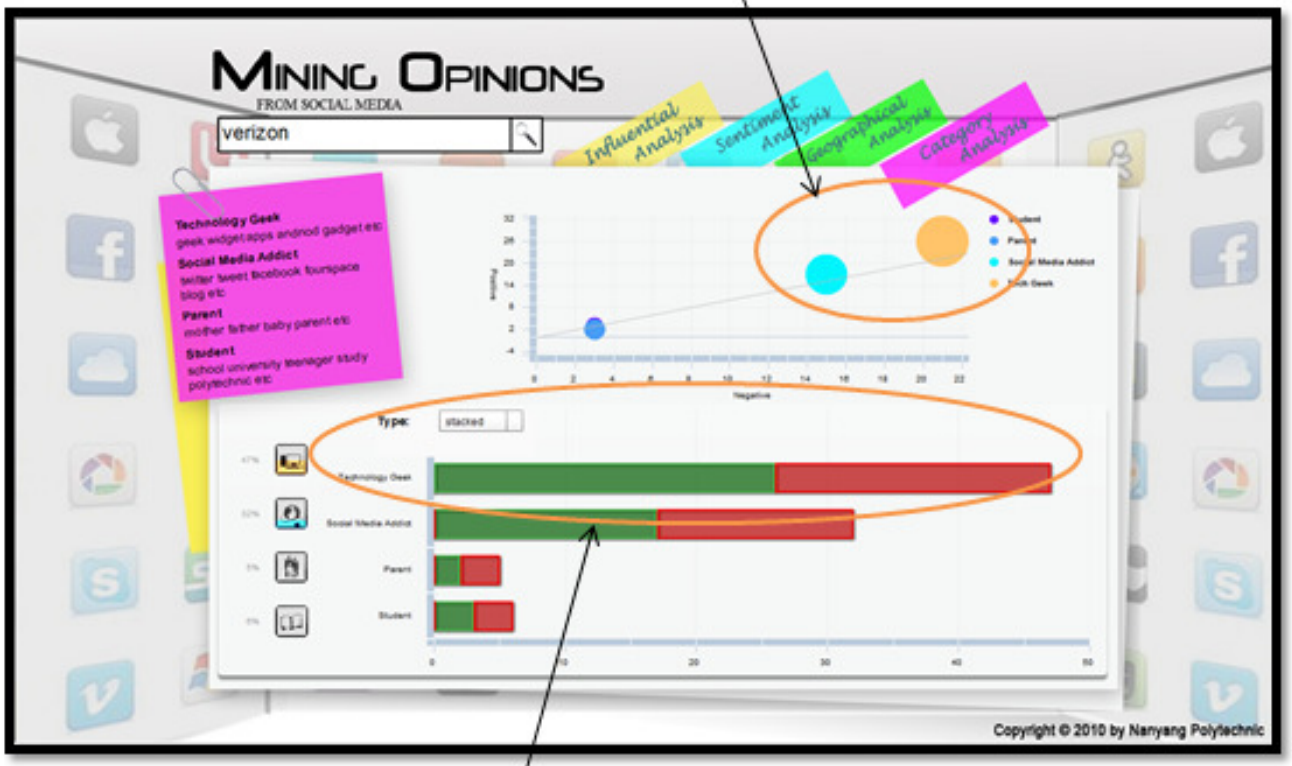
MacWorld? Verizon iPhone Review #6: The only difference that matters is the network itself. http://bit.ly/gt81ce #VZWiphone

Sentiment Analysis



User Category Analysis

Bubble graph (
- centre of the bubble (above the separator, positive sentiment)
- volume of the bubble (percentage of users in the category. the bigger the bubble, the more the users)



Sentiment bar chart in stacked (absolute percentage of each category) or 100% (relative percentage in 100% for the category)

THANK YOU!

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