Text Analytics Industry Use Cases
(& the Path Forward for Text Analytics)

Aiaioo Labs - 2012

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The Team

- Cohan
  - 10 years in industry
  - Research interests: NLP and ML
- Sumukh
  - 8 years in industry
  - PhD from University of Melbourne
- Madhulika
  - 6 years in industry
  - MS from UT Austin
  - Internships at Microsoft and RRI

We Develop

1: AI Algorithms

2: Text Analytics Technology

3: Business Use Cases

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Research on AI Algorithms

Tools for Text Analytics

Tools for Education

Tools for Graph Analysis

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Programming Using a Natural Language

```
Let x be 3.  y is 9.  What is x times y?  While x is less
than y, print x and then increment x.
```

The program executed successfully.

Output	27.0 3.0 4.0 5.0 6.0 7.0 8.0
Variables	y=9.0 x=9.0

Run program

Translate to: Kannada, English, Hindi, Tamil, French, German, Japanese or Chinese

AI

Text Analytics APIs

How we handle all kinds of things people say

What is Text Analytics ?

Insights from Text

Meaning from Text

Business Use Cases

All that tech talk is fine, but how can you make us a heap more money next month?

Two Ways of Using Text Analytics

Operations - Client Use Case

WisdomTap
Optimized Intent Marketing

Intent Marketing Platform About Us Contact

People signal their intent to buy on Twitter. Find more leads.

Your Customers announce their **intent to buy** by asking for product and service recommendations on Twitter.

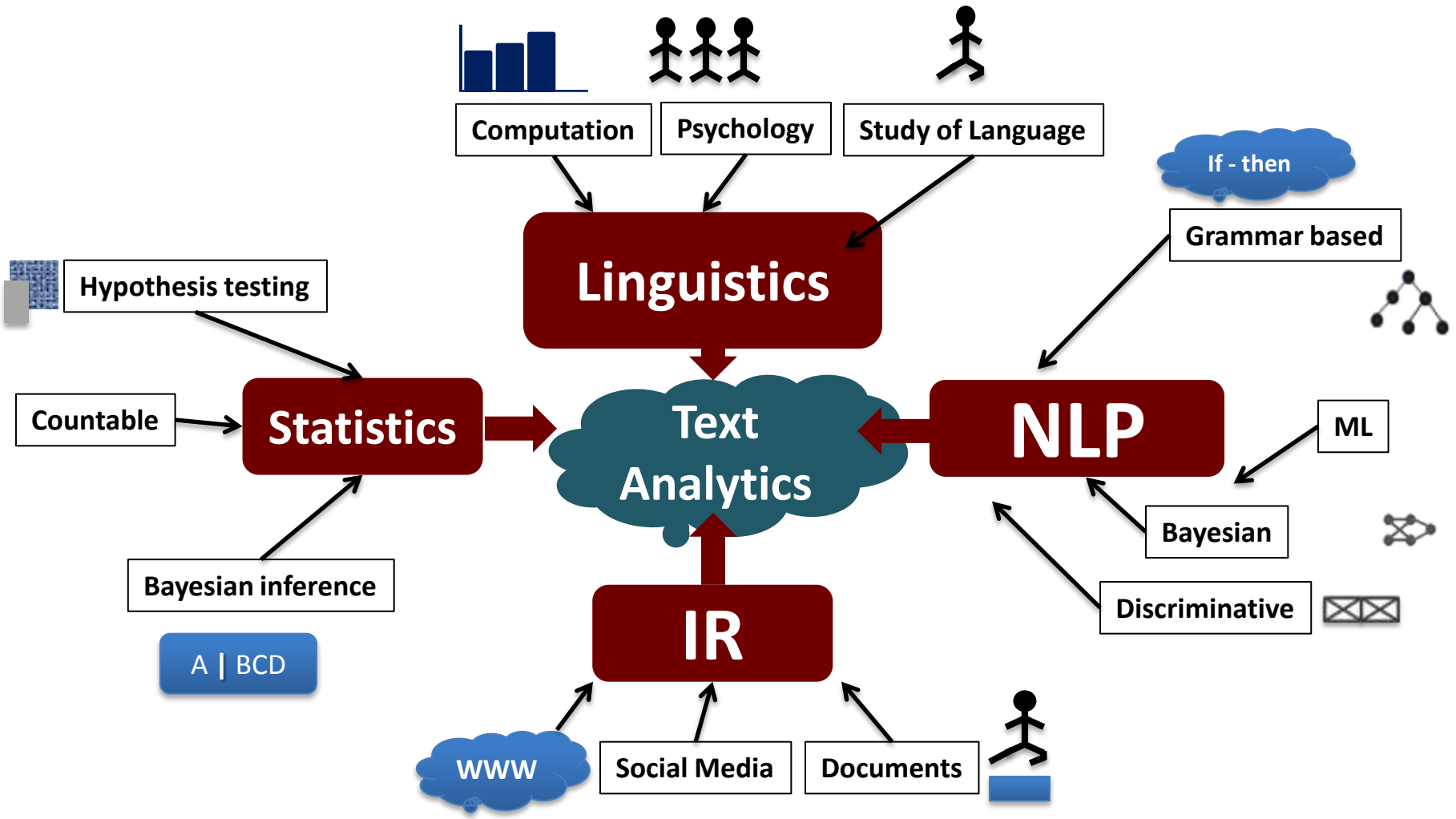
Decision Making - Use Case

A social media - community engagement measurement tool & dashboard - A SourceN Venture!

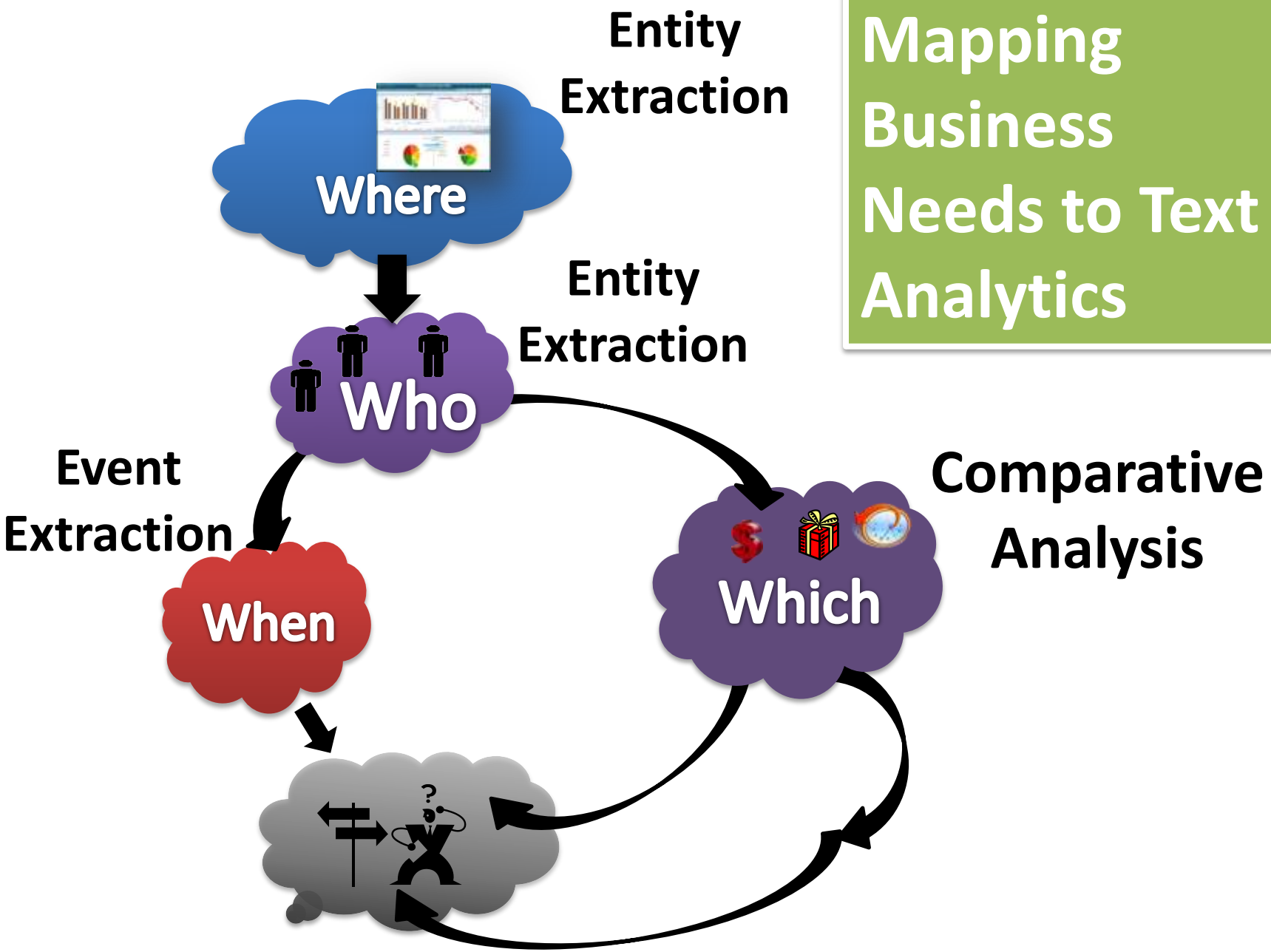
Text Analytics Details

How to handle all kinds of things people say

What is Text Analytics ?



Mapping Business Needs to Text Analytics



Extracting Meaning

Pragmatic Analysis: Sales Conversation

Semantic Analysis: I/Person am looking for a Hyundai/Thing car/Thing in Bangalore/Place

Syntactic Analysis: I/Pronoun am/BE looking/V for a Hyundai/NP car/NN in Bangalore/NP

Text: I am looking for a Hyundai car in B'lore

Entity Extraction

Text: I am looking for a Hyundai car in Bangalore

Semantic Analysis: I/Person am looking for a Hyundai/Thing car/Thing in Bangalore/Place

Entities:

I	**Person**
Hyundai car	**Thing**
Bangalore	**Place**

Relation Extraction

Text: Tim Cook is the new CEO of Apple Computers

Analysis: Tim/Person Cook/Person is the new CEO of Apple/Org Computers/Org

Relation: CEO_of

Tim Cook (Person) **Apple Computers(Org)**

Sentiment Analysis

Raw Text: I am sad that Steve Jobs died

Analysis: This person holds a positive opinion on Steve Jobs

Sentiment Holder:	**I**
Object of Sentiment:	**Steve Jobs**
Polarity of Sentiment:	**positive**

Two Kinds of Sentences

Convey intention: I want to buy a computer.

Information: There was heavy snowfall in Sikkim.

Beyond Traditional Approaches to Extracting Meaning

Intention Analysis

Raw Text: Are you sad that Steve Jobs died?

Analysis: This person is inquiring about someone's emotions concerning Steve Jobs

Intention Holder: **I**

Intention: **inquire**

Intention Analysis – Categories of Intention

Categories	Parent Category	Department	Urgency	Source
Purchase		Sales	High	CRM
Sell		Procurement	Medium	ERP
Inquire		Help/Sales	High	CRM
Direct		Operations	High	CRM
Compare		Market Research	Low	CRM
Suggest		Market Research	Low	Social
Opine		Design	Low	Social
Praise	Opine	Design	Low	Social
Criticize	Opine	Design	Low	Social
Complain		Customer Service	High	CRM/Social
Accuse		Customer Service	Critical	CRM
Quit		Customer Service	Critical	CRM/Social
Express		Call Center Training	Low	Transcripts
Thank	Express	Call Center Training	Low	Transcripts
Apologize	Express	Call Center Training	Medium	Transcripts
Empathize	Express	Call Center Training	Medium	Transcripts

Event Analysis

Raw Text: There is heavy snowfall in Sikkim.

Analysis: Snowfall event

Event: **snowfall**

Event Analysis

Categories
Acquisition
Merger
Spin Off
Sale
Partnership Formation
Declaration of Bankruptcy
Renaming
Closing Down
Opening Facility
Closing Facility
Business Deal
Product Launch
Product Withdrawal
Employee Joining
Employee Resignation
Employee Change of Position

Fact Analysis

Raw Text: Bangalore is the capital of K'taka

Analysis: capital_of relation exists

Entity: **Bangalore/Place**
Karnataka/Place

Relation: **Bangalore capital_of K'taka**

Uses

Decision Making - Reports

Pulling report from **CRM** tools on loyalty, competition, etc. Computation of metrics.

Operations

Intention Analysis in **customer service, online reputation management & placement of ads** or in **Alerting Systems**.

Decision Making Uses

Tracking Large Numbers of Users

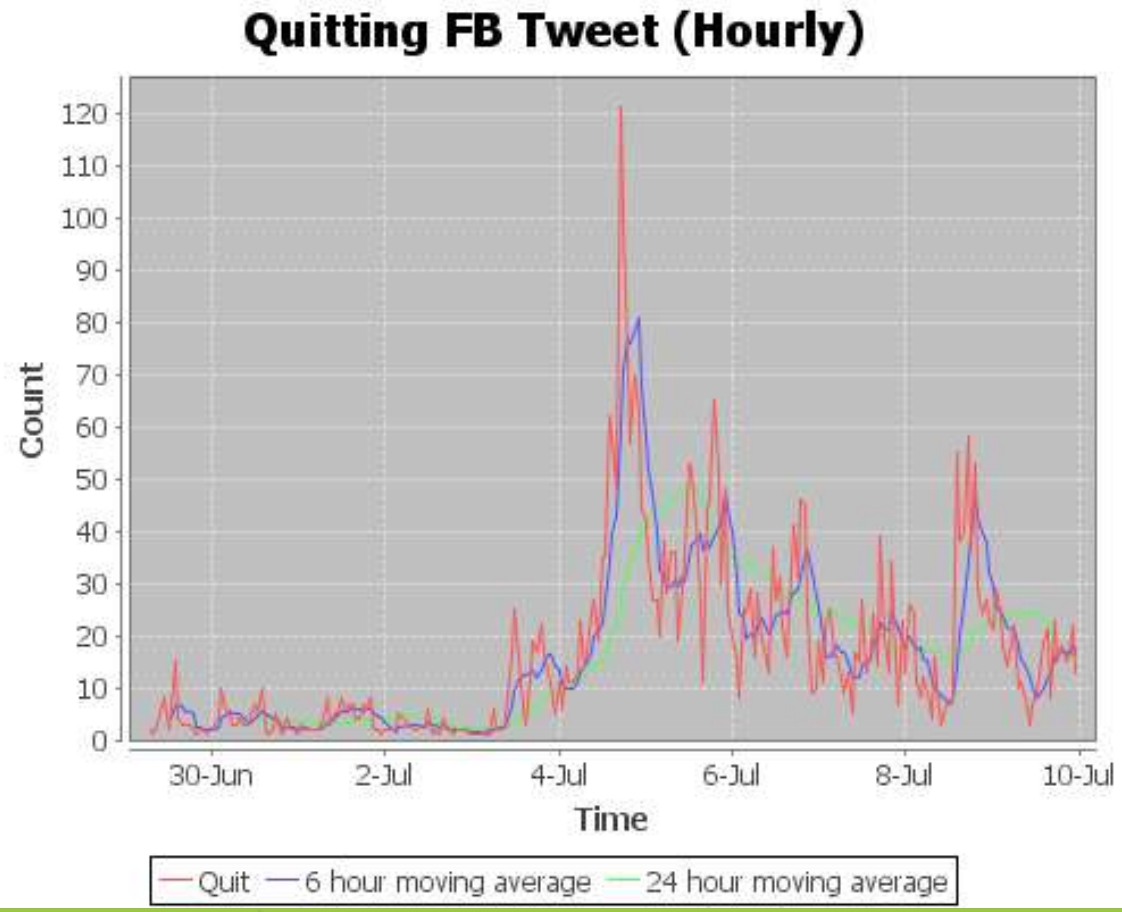
For strategy decisions – politics, launches

Metrics

Dials for navigating by

Decision Making Example – Using Quit Intention

Quit message chart for **Facebook** during the week after **Google+** launched.



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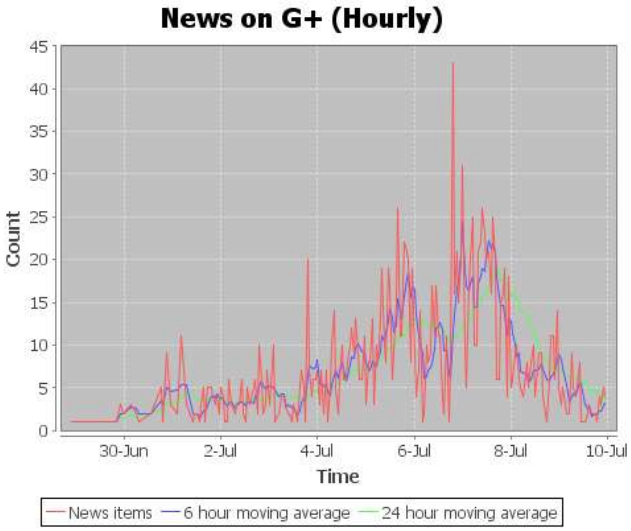
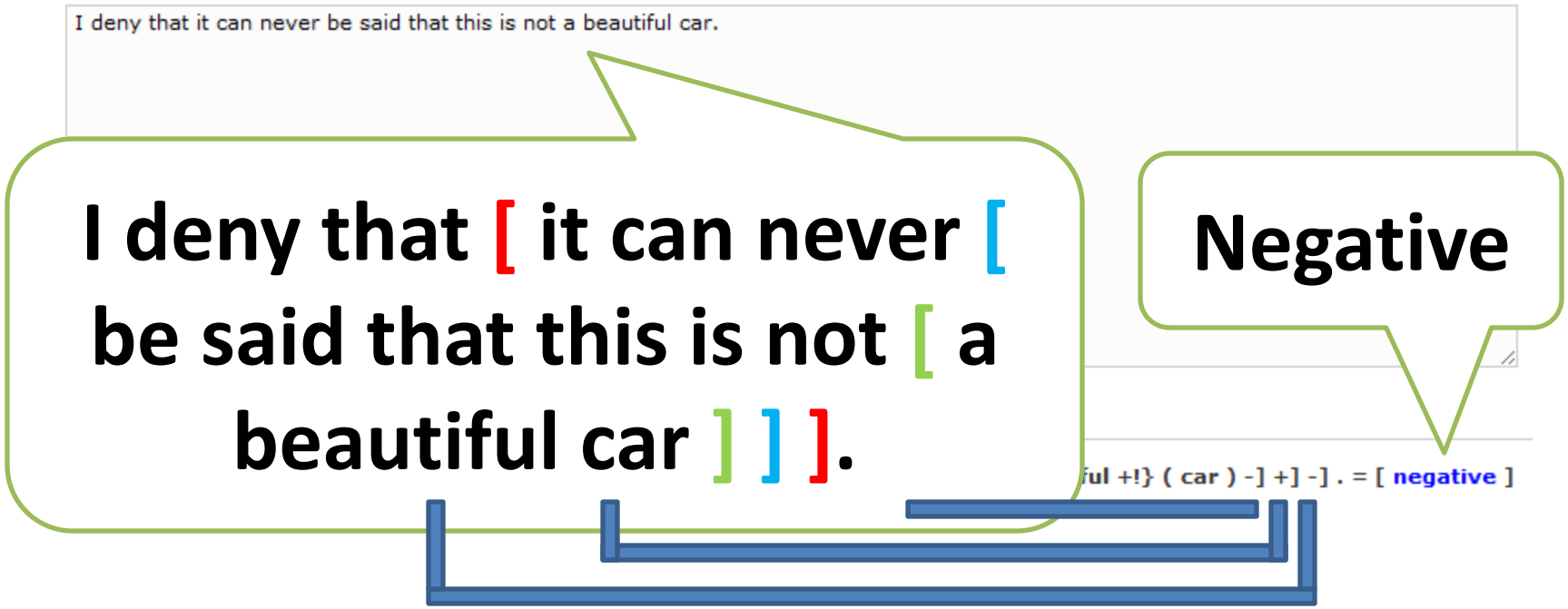
Types of Reports

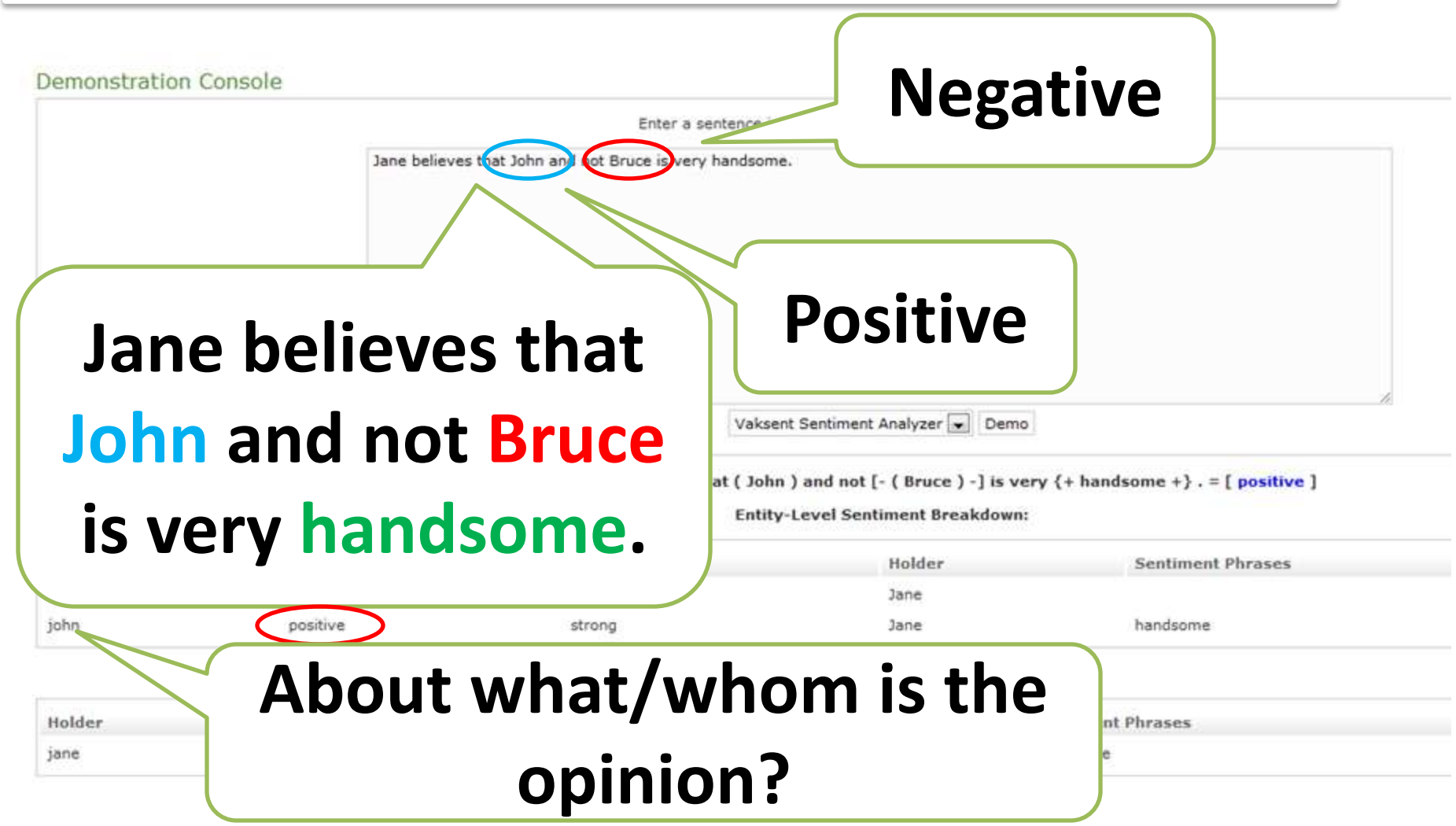
1. **Time Series Graphs**
2. **Charts**
3. **Tag Clouds**
   - Identifies popular topics
4. **Event Summaries**
5. **Sentiment Report**
6. **Dials – Complaint Metrics**



Metrics Example – CSAT



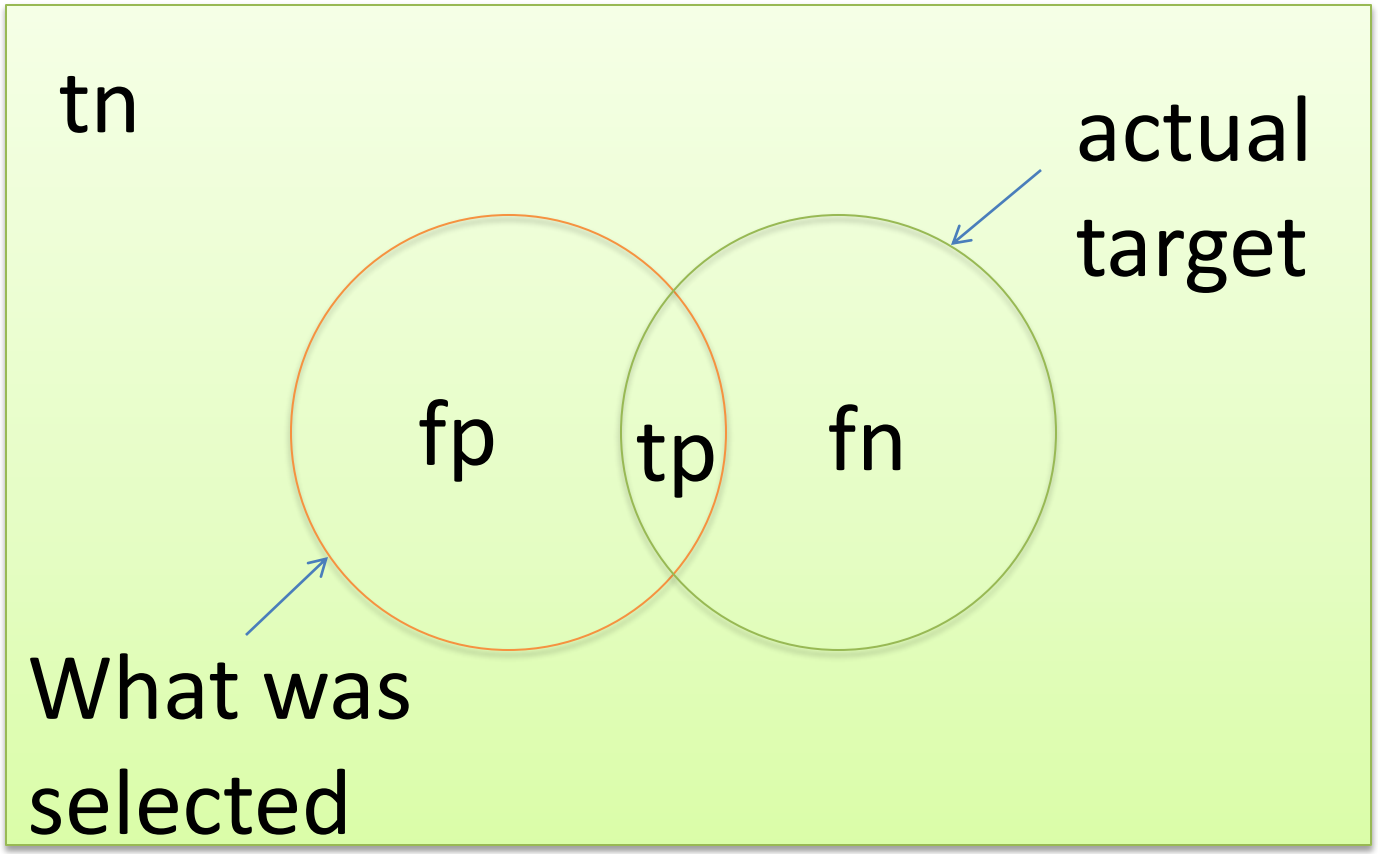
Example – Sentiment Analysis – Entity Level Sentiment



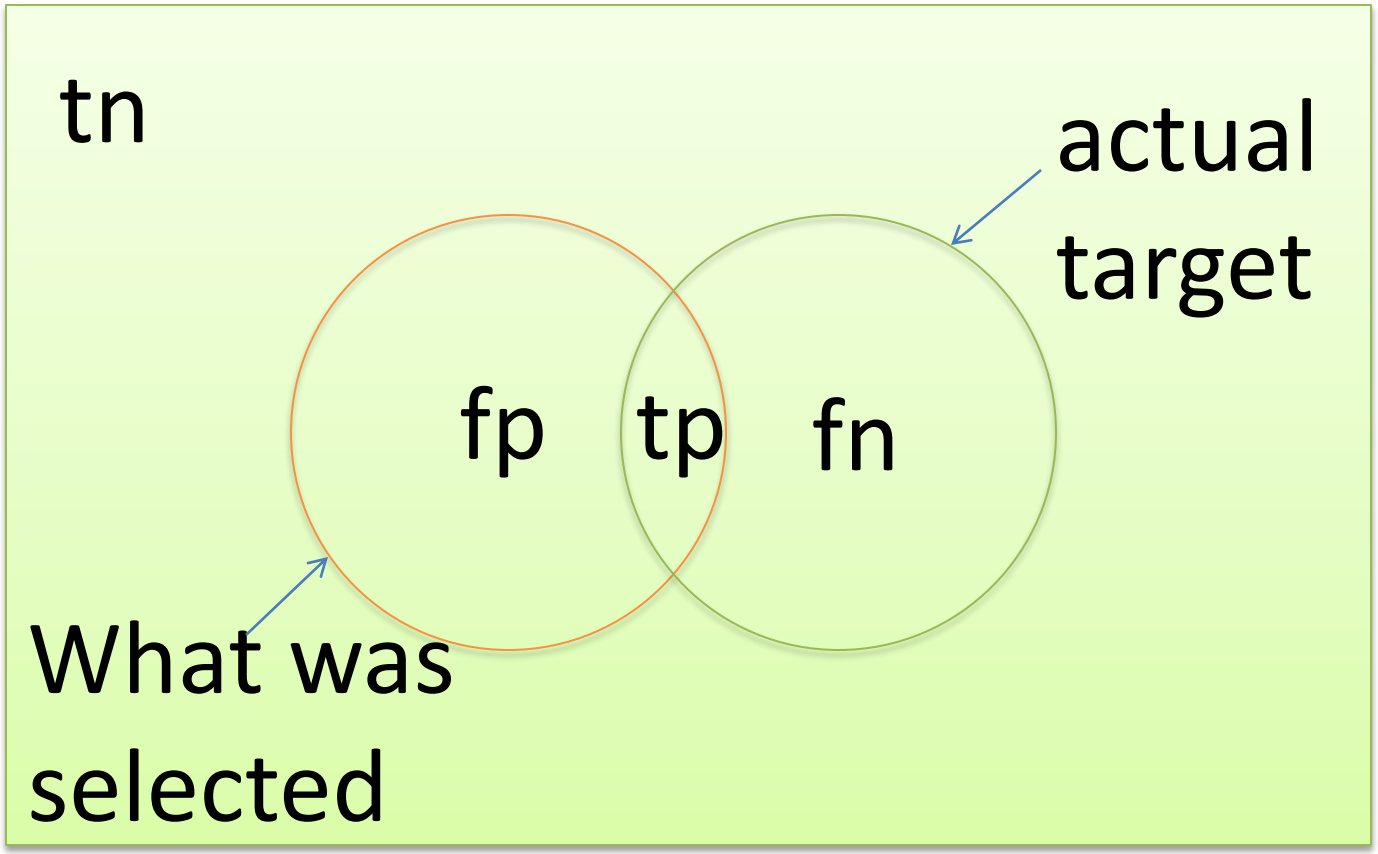
Error Compensation!

Section	Problem	Compensation
Accuracy	• Low accuracy	• Trade off recall for precision
Precision	• Low Precision	• Use ratios and timelines
Domain	• Different domain	• Retraining

Precision (tp/tp+fp)



Recall (tp/tp+fn)



Example

Precision = {inquire=0.81, direct=0.5163, accuse=0.6944, wish=0.918, compare=0.851, sell=0.9621, complain=0.8622}

Recall = {direct=0.6, inquire=0.3078, accuse=0.5102, wish=0.6021, compare=0.4145, sell=0.4069, complain=0.5853}

Example

F-Score = {direct=0.5566, inquire=0.4993, accuse=0.5952, wish=0.7435, compare=0.5939, sell=0.6257, complain=0.7104}

What you can learn about a brand:

1: Who are a product's strongest competitors?

2: How commoditized is the market?

3: What are the weaknesses of the product?

4: How loyal are customers in an industry?

Example – 1: How do you measure CSAT?

Measurement Proxy:

Use **opine intention**

CSAT =

number of positive mentions of brand / number of opinionated mentions of brand

Example – 2: Who are a product's competitors?

Measurement Proxy:

Use **compare intention**

competitor's strength =

number of mentions of competitor / number of mentions of all brands or generic products

Example – 3: How commoditized is the market?

Measurement Proxy:

Use **purchase intention**

commoditization =

number of mentions of brands / number of mentions of generic product

Example – 4: How loyal are customers?

Measurement Proxy:

Use **quit intention**

inverse of loyalty =

number of quit intentions / total mentions

Example – 5: What is the desirability of a brand?

Measurement Proxy:

Use **purchase intention**

desirability =

number of purchase intentions / total mentions

Example – 6: How reliable is a product?

Measurement Proxy:

Use **complain intention**

reliability =

number of complain intentions / total mentions

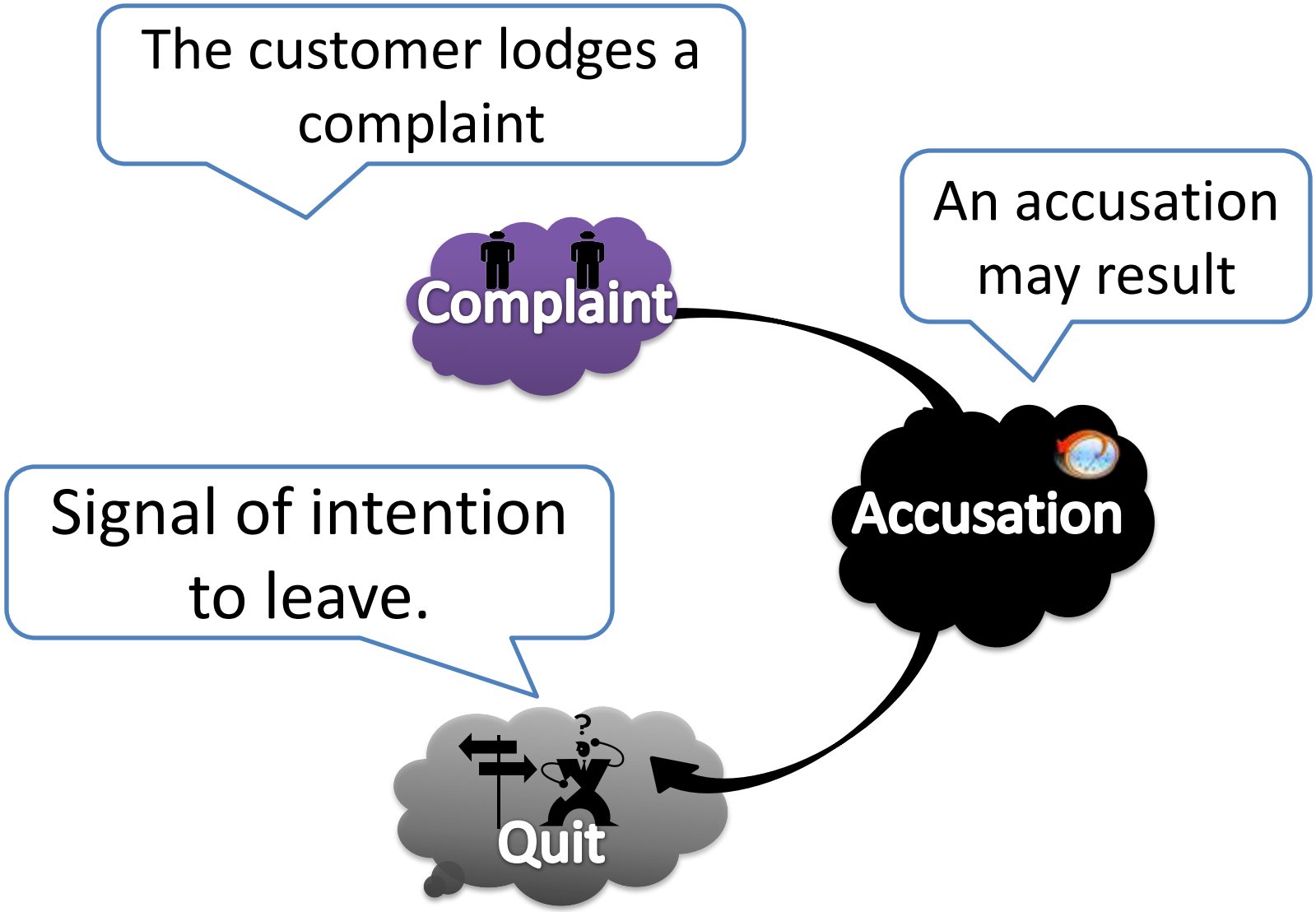
Operations Uses

Timeliness

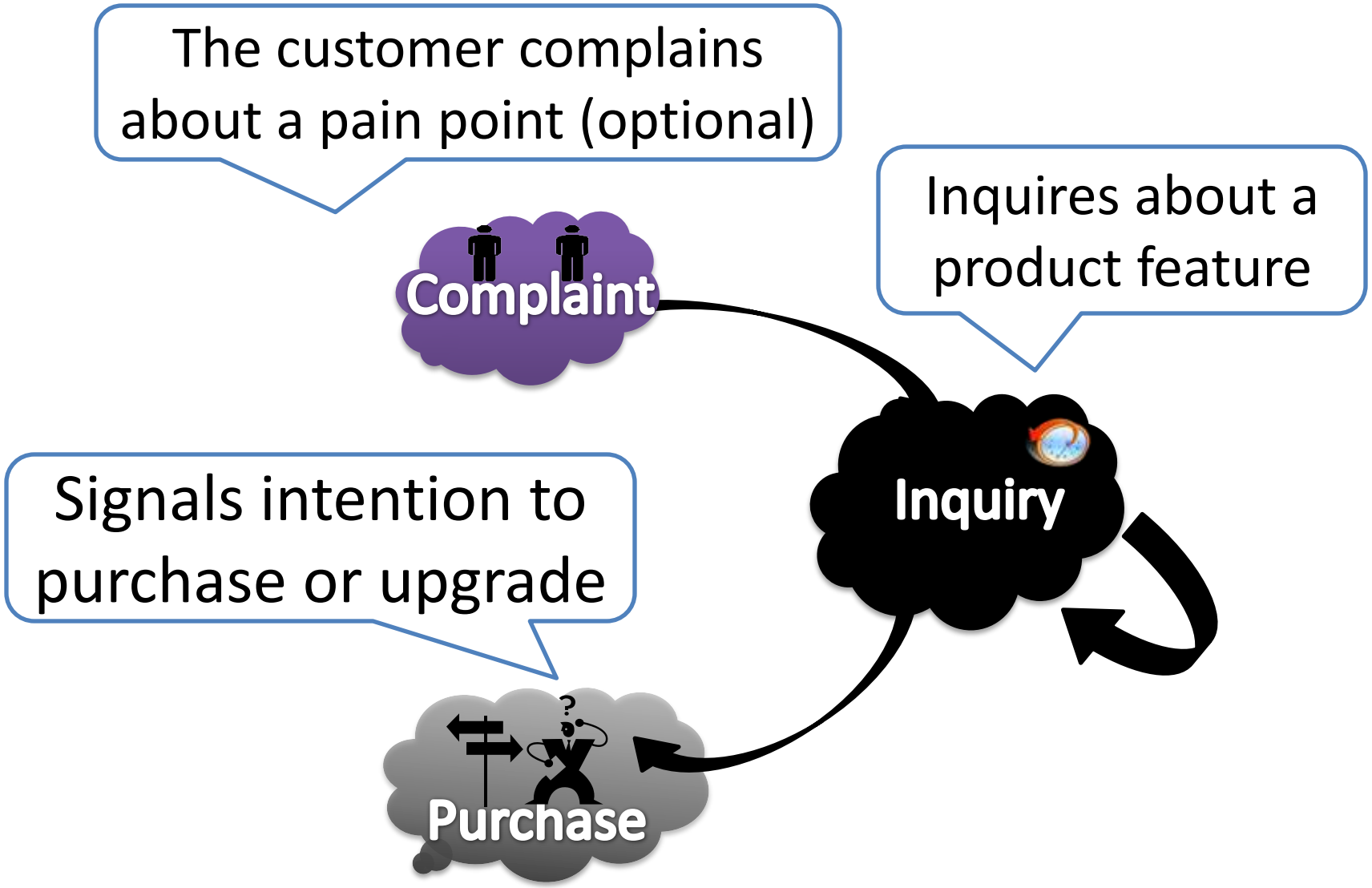
For investing

Prioritization / Routing

Dealing with large numbers



Call Center Customer Churn Model



Call Center Customer Sales Opportunity Model

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