

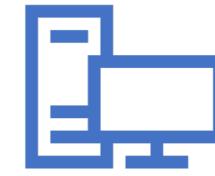
CSCI 5408



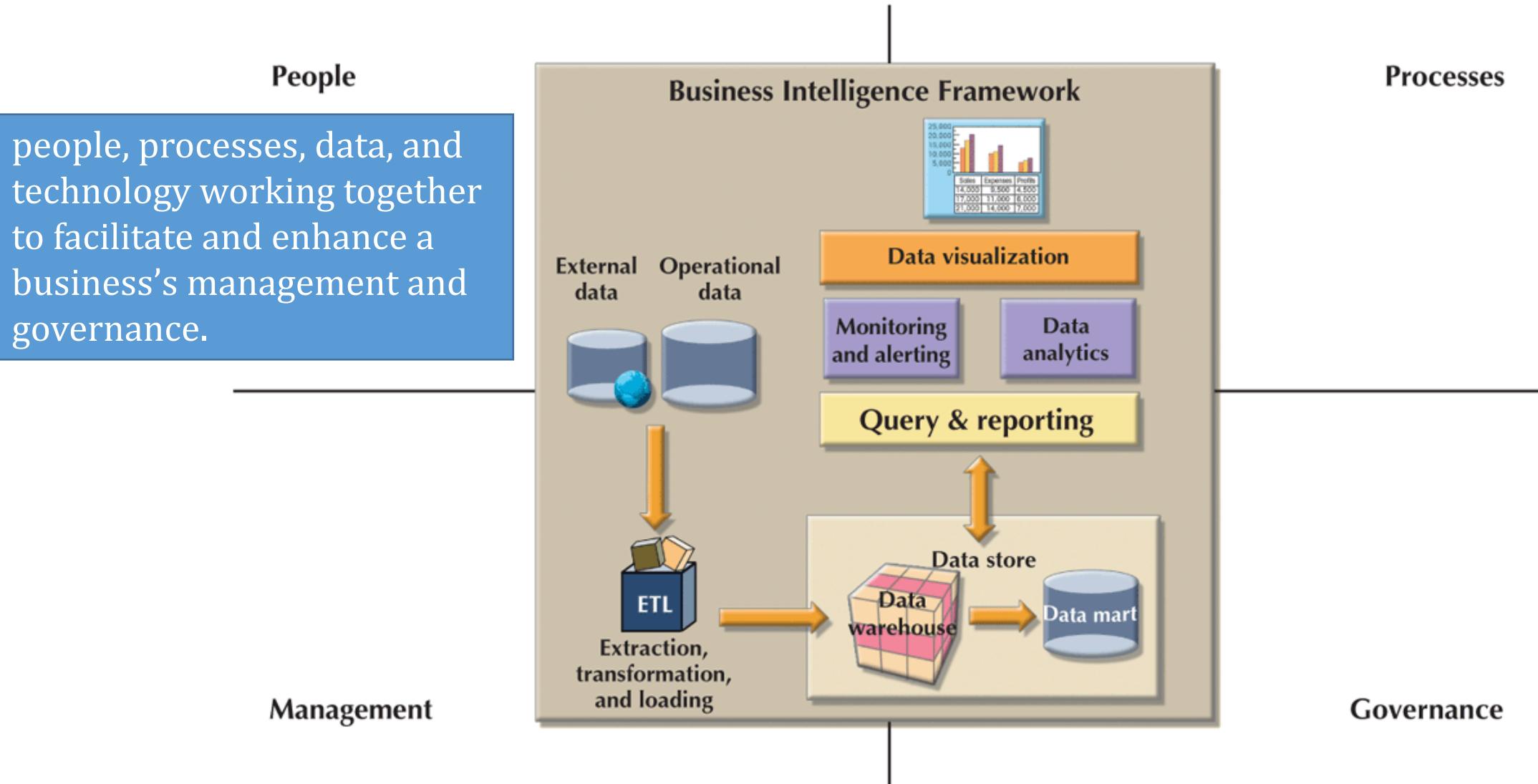
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Outline

- What are the types of Data Analytics?
 - Text Analysis
- How to perform some basic analysis?



Business Intelligence Architecture



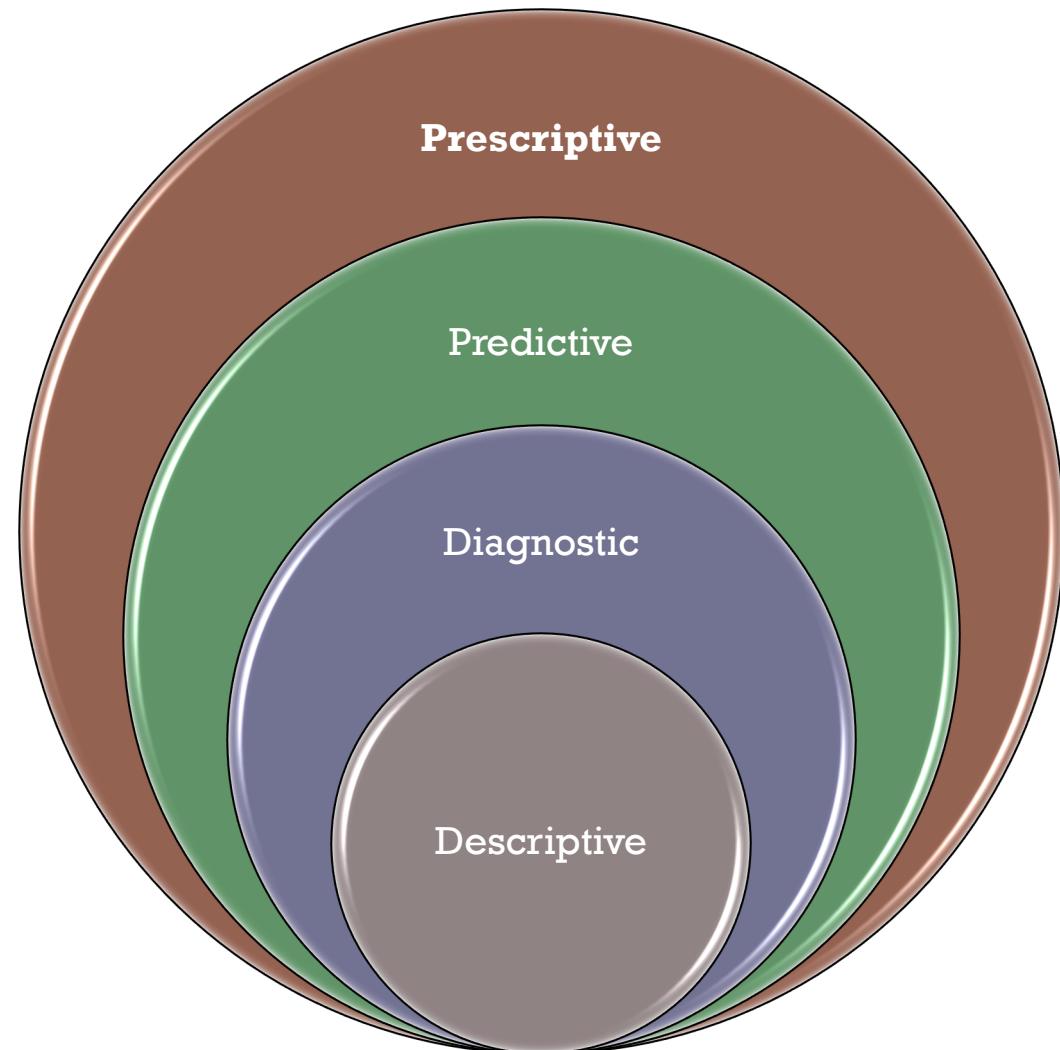
TYPES OF DATA ANALYSIS

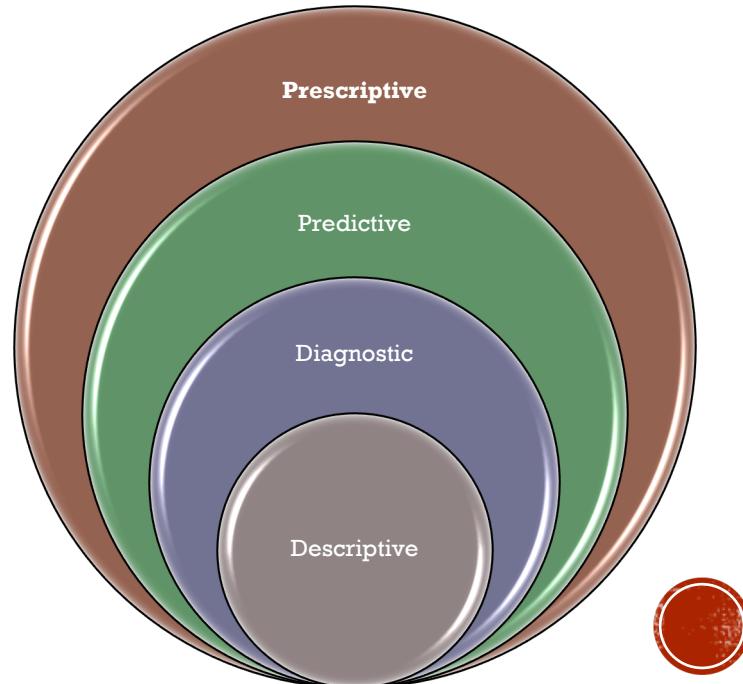
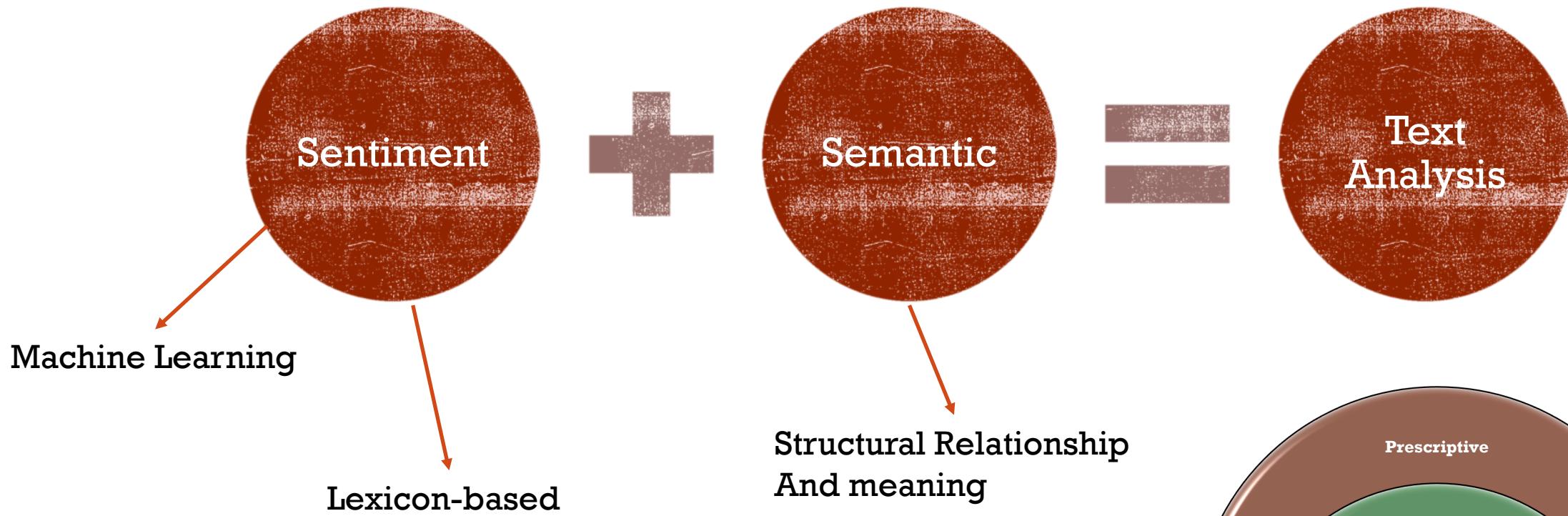
How to modify or What to do?

What might happen?

Why it happened?

What happened with the data?





Sentiment Analysis



Echo Dot (3rd gen) - Smart speaker with Alexa - Charcoal

by Amazon

★★★★★ 7,410 ratings

| 1000+ answered questions

Amazon's Choice for "amazon alexa"

List Price CDN\$ 69.99

Deal Price: **CDN\$ 29.99** & FREE Shipping on
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You Save: **CDN\$ 40.00 (57%)**

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Ships from and sold by Amazon.ca.

1 new from **CDN\$ 29.99**

Style: Echo Dot

Echo Dot

Echo Dot with clock (Sandstone only)

Customer reviews

★★★★★ 4.5 out of 5 ▾

7,410 customer ratings



By feature

Voice Recognition

★★★★★ 4.5

Alexa integration

★★★★★ 4.5

Smart Features

★★★★★ 4.4

By customer groups & interests

Amazon Echo

★★★★★ 4.5

Amazon Prime members

★★★★★ 4.6

Customers in Ontario

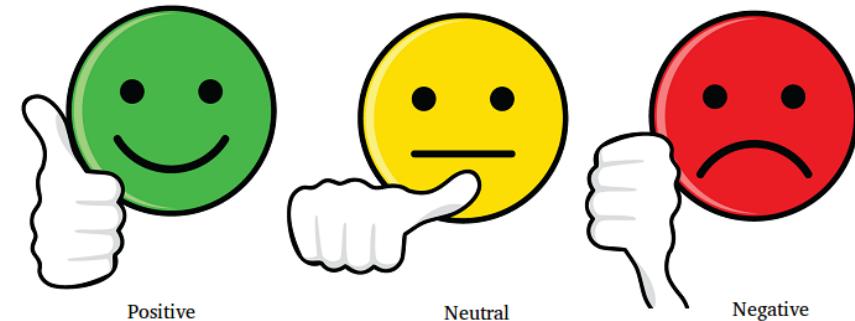
★★★★★ 4.5

Is this feature helpful?

Yes

No

What is Sentiment Analysis?



- In general, Sentiment analysis can be defined as finding **polarity** of a text.
- Is the given text “**positive**”, “**negative**” or “**neutral**”?
- Is there any value of sentiment analysis?
- Is there anything more?

 Frozen II is destined to be one of those movies children will want to see dozens of times.

Nov 21, 2019 | Rating: 3.5/4 | [Full Review...](#)



Nell Minow
RogerEbert.com
★ Top Critic

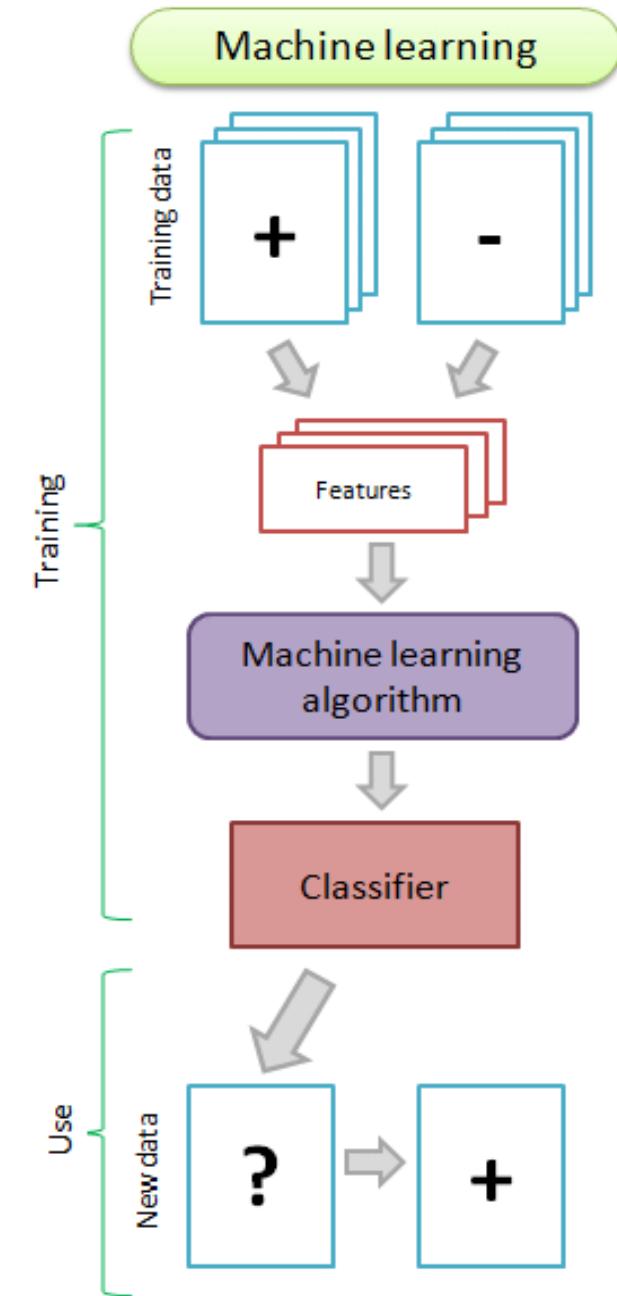
Source: https://www.rottentomatoes.com/m/frozen_ii

(1) Machine Learning-based approach

- Belongs to supervised classification
- Higher accuracy rate
- Portability issue can be a disadvantage
- Instead of using documents as labels, phrases can be used

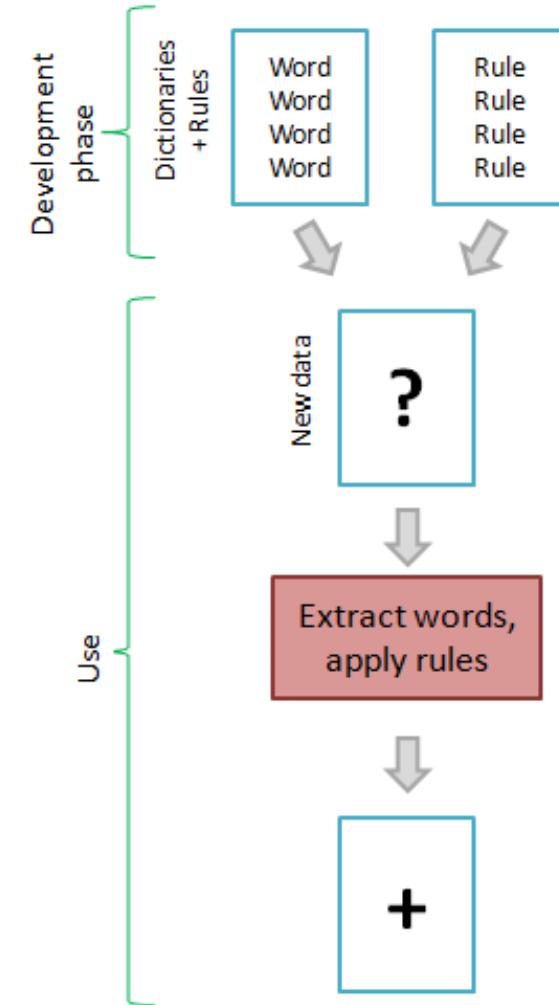
E.g. Naïve Bayse

$$P(A|B) = \frac{P(B|A) \times P(A)}{P(B)}$$



(2) Lexicon -based approach

- Belongs to Unsupervised classification
- Dictionary or rule based method
- Dictionary contains words and polarity
- Values aggregated, and various aggregation algorithms are used
- An aggregation of the positive/negative values of the words in the text produces the semantic orientation for the text



Semantic Analysis

What is Semantic Analysis?

- It can be considered as understanding of structural relationship between words
- Understanding the context can provide additional information, which can be beneficial for the market research.
- "Crash" can mean an auto accident, a drop in the Stock Market, to attend a party without being invited



Examples of Semantic Analysis

- Hyponymy: A sub category of a general class. E.g. A Mobile Phone (hyponym) **is a type of** Electronic Device (hypernym).
- Meronymy: An item, which is part of another item.
 - E.g. A Laptop (holonym) **contains** a Trackpad (meronym)
 - Engine (meronym) **is in** Car (holonym)
- Entity Extraction: Identifying named entities like people, place, fruits etc.
- Intent Classification: Understanding or classifying the text based on intents

How to perform basic analysis? (Demo)

<https://rdrr.io/snippets/>

Example: The iris data are a data frame of 150 measurements of iris petal and sepal lengths and widths, with 50 measurements for each species of “setosa,” “versicolor,” and “virginica.” Let us assume that we are doing some computation on the sepal length.

Source: <https://www.sciencedirect.com/topics/mathematics/iris-data>

Questions to Consider

- Can we say, sentiment analysis is a type of semantic analysis?
- Is prescriptive analysis always needed?
- How to build a good predictive model?

