Menganalisa Konten Percakapan di Media Sosial

HI!

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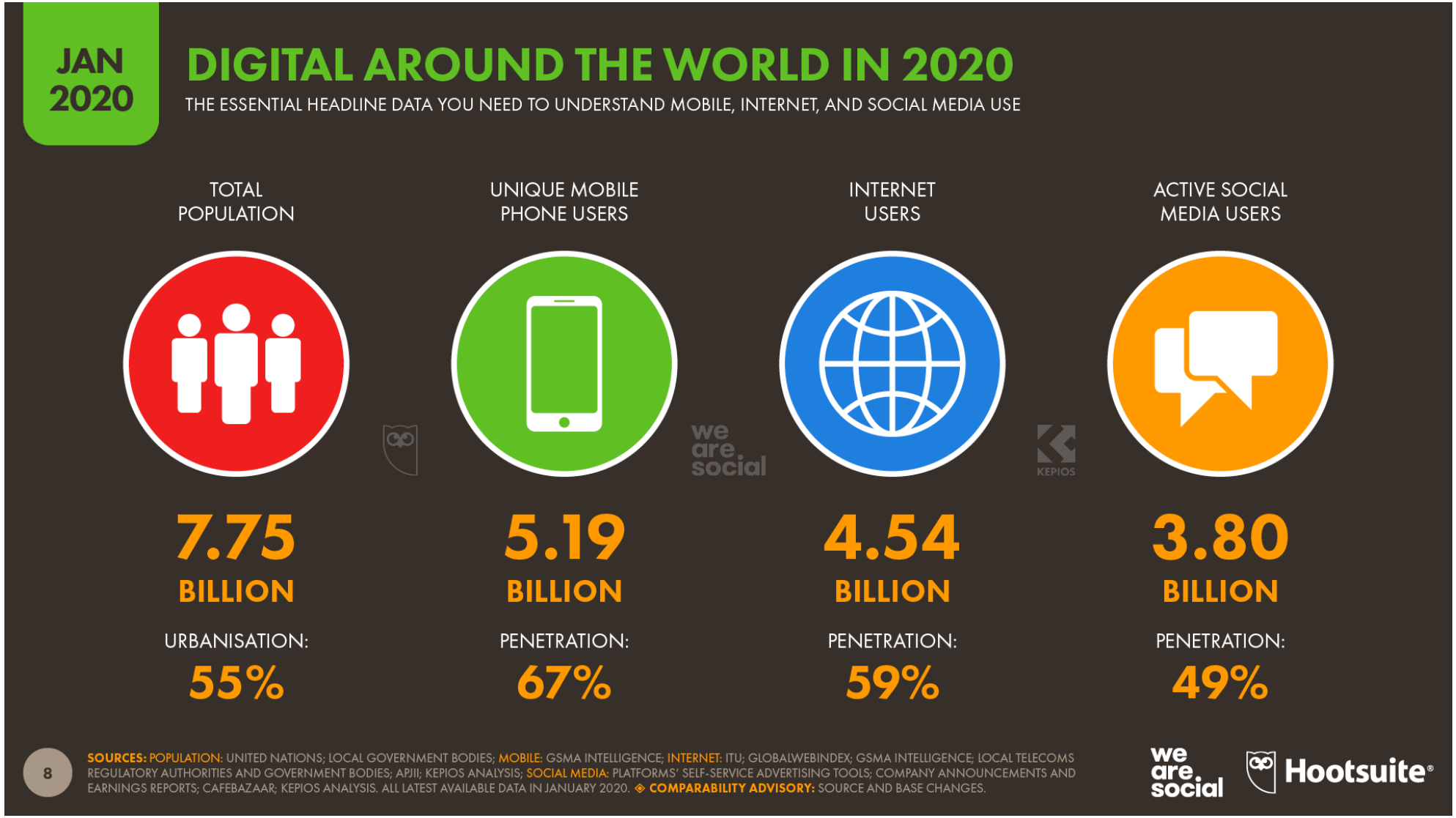
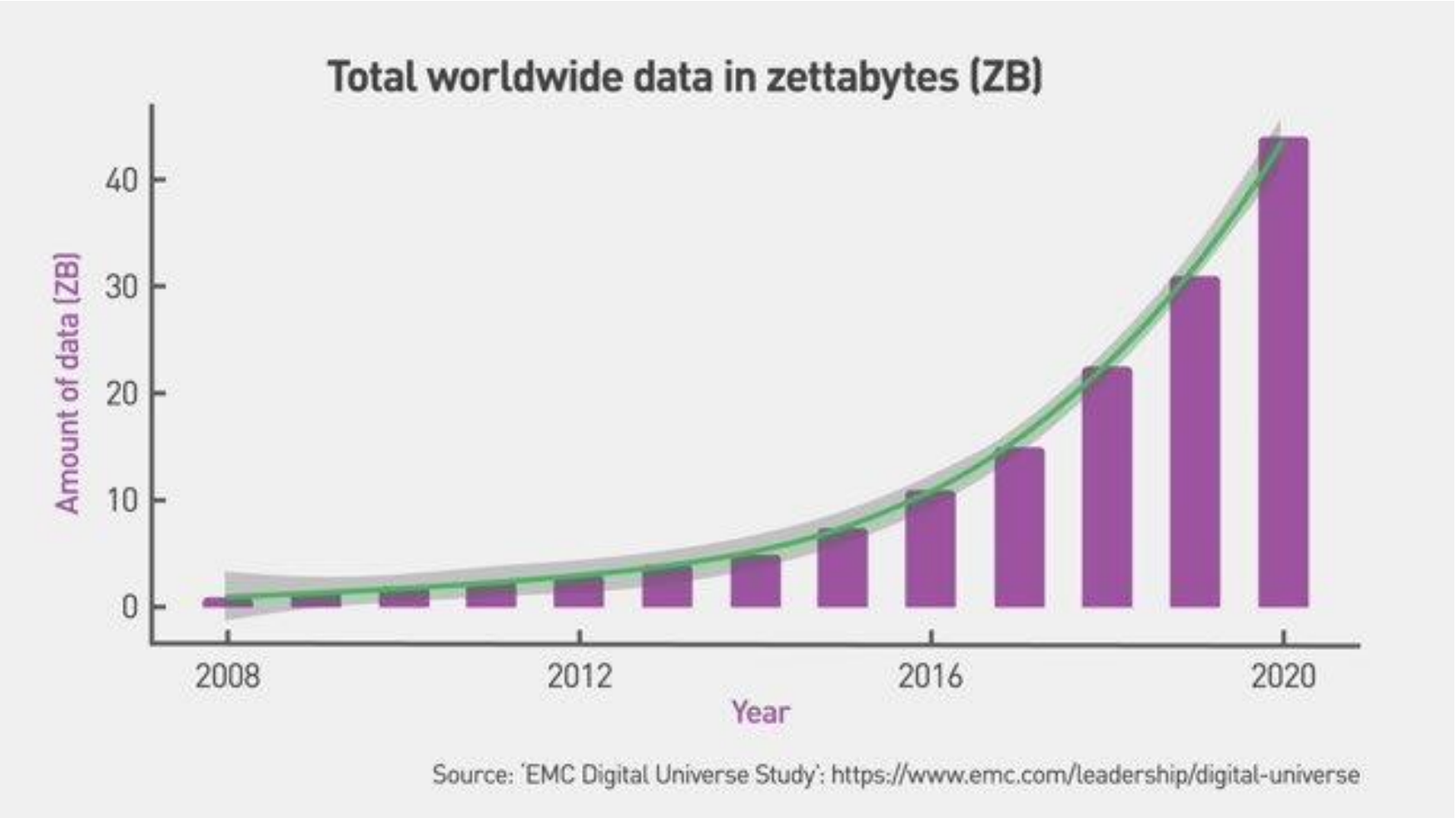
Medium/GitHub/Instagram/SpeakerDeck/Kaggle: **@apriandito**

Apa saja yang akan kita pelajari?

1. Fenomena Big Data
2. Konsep Analisis Media Sosial
3. Mengambil Data Media Sosial (Twitter)
4. Text Mining
5. Text Classification (Sentiment Analysis)
6. Topic Modelling *(Opsional)*


JAN 2020
DIGITAL AROUND THE WORLD IN 2020
THE ESSENTIAL HEADLINE DATA YOU NEED TO UNDERSTAND MOBILE, INTERNET, AND SOCIAL MEDIA USE
TOTAL POPULATION
UNIQUE MOBILE PHONE USERS
INTERNET USERS
ACTIVE SOCIAL MEDIA USERS
we are social
KEPIOS
7.75 BILLION
5.19 BILLION
4.54 BILLION
3.80 BILLION
URBANISATION: 55%
PENETRATION: 67%
PENETRATION: 59%
PENETRATION: 49%
8
SOURCES: POPULATION: UNITED NATIONS; LOCAL GOVERNMENT BODIES; MOBILE: GSMA INTELLIGENCE; INTERNET: ITU; GLOBALWEBINDEX; GSMA INTELLIGENCE; LOCAL TELECOMS REGULATORY AUTHORITIES AND GOVERNMENT BODIES; APJII; KEPIOS ANALYSIS; SOCIAL MEDIA: PLATFORMS' SELF-SERVICE ADVERTISING TOOLS; COMPANY ANNOUNCEMENTS AND EARNINGS REPORTS; CAFEBAZAAR; KEPIOS ANALYSIS. ALL LATEST AVAILABLE DATA IN JANUARY 2020. COMPARABILITY ADVISORY: SOURCE AND BASE CHANGES.
we are social
Hootsuite®

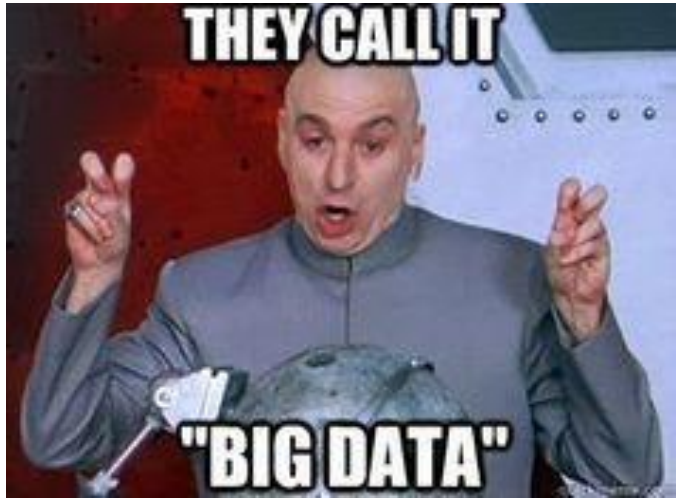

Total worldwide data in zettabytes (ZB)
Amount of data (ZB)
40
30
20
10
0
2008
2012
2016
2020
Year
Source: 'EMC Digital Universe Study': https://www.emc.com/leadership/digital-universe

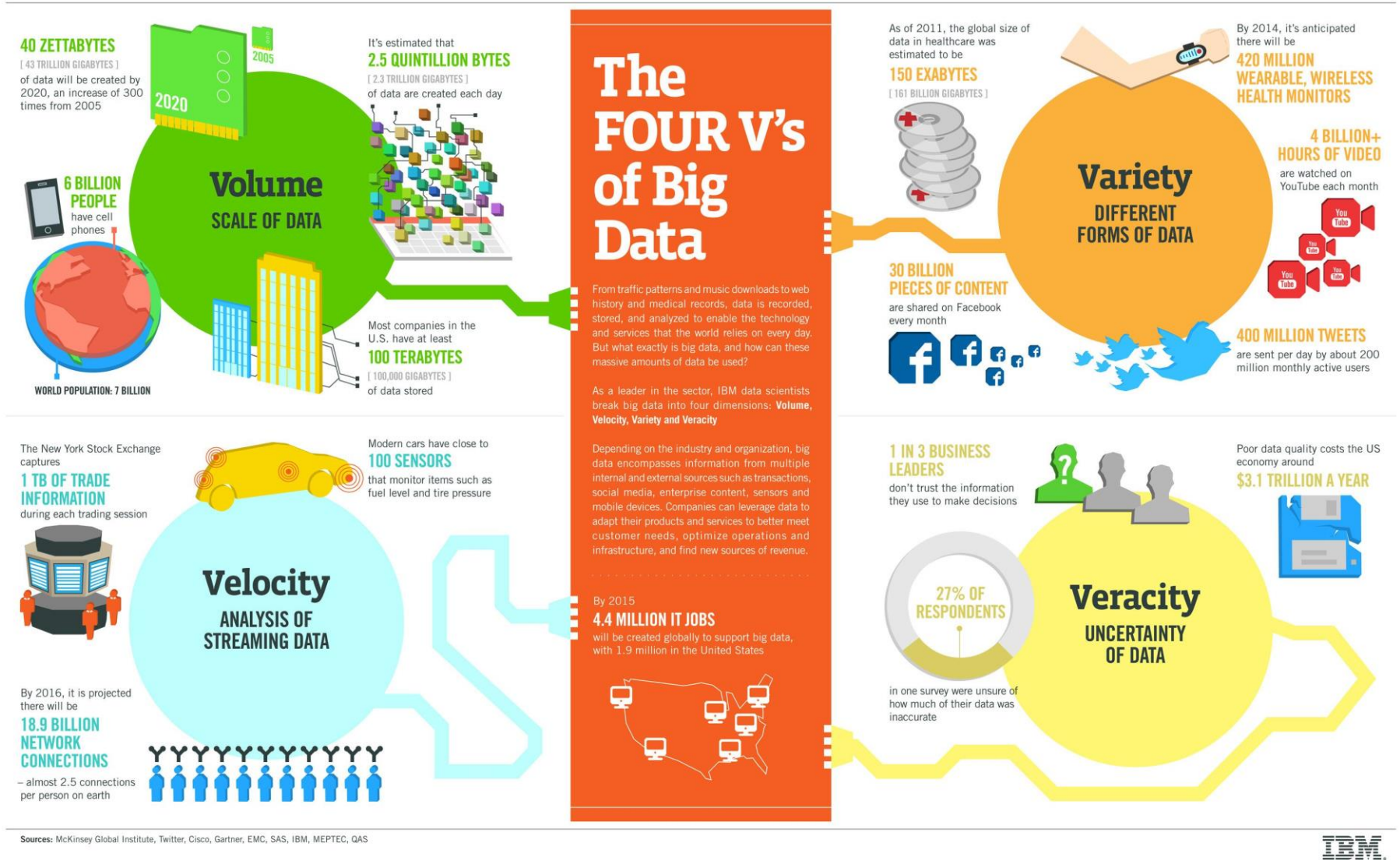
Big Data

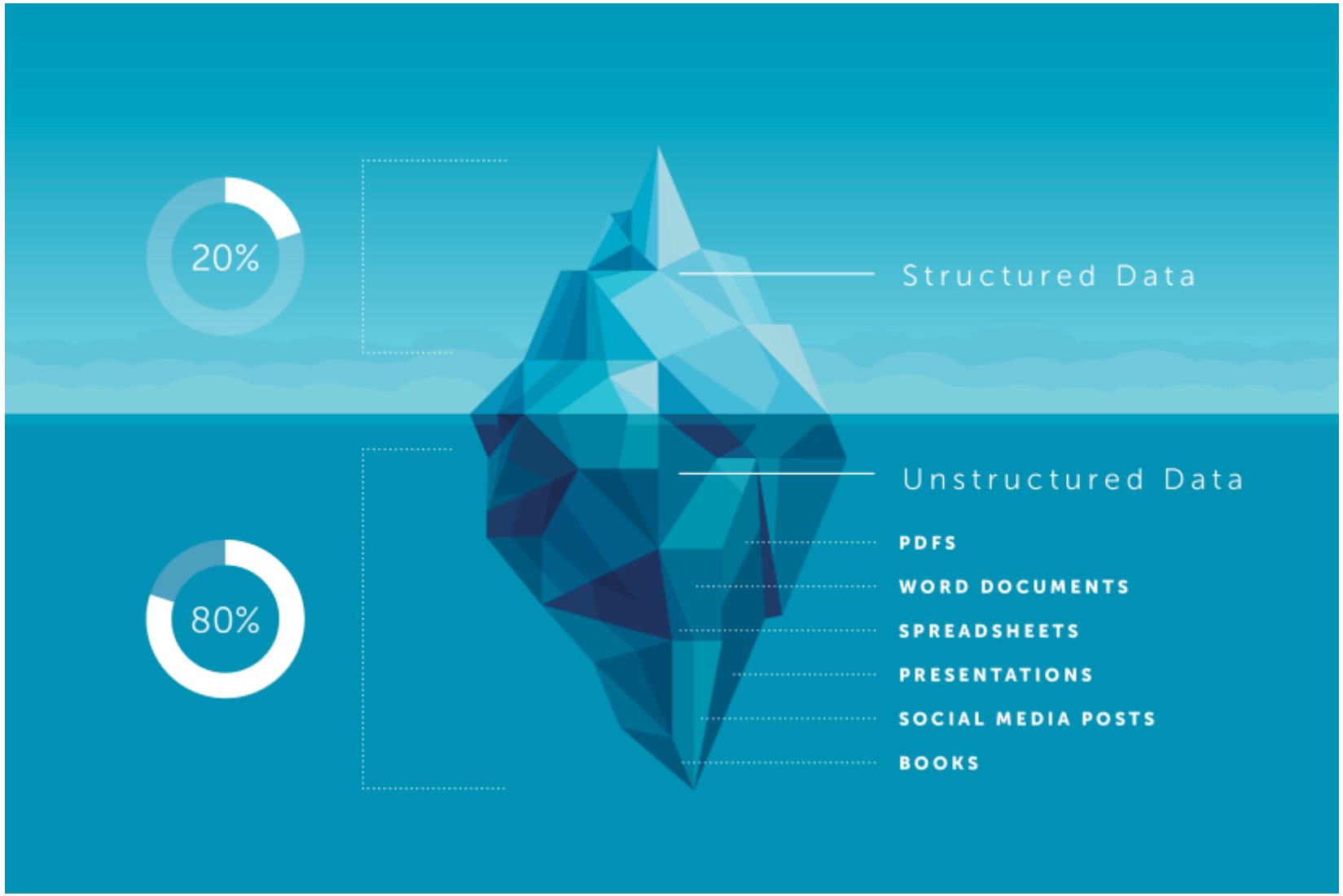
Big Data adalah istilah yang menggambarkan volume data yang besar, baik data yang terstruktur maupun data yang tidak terstruktur.

Big data memiliki 4 Karateristik:

- Volume
- Variety
- Velocity
- Veracity

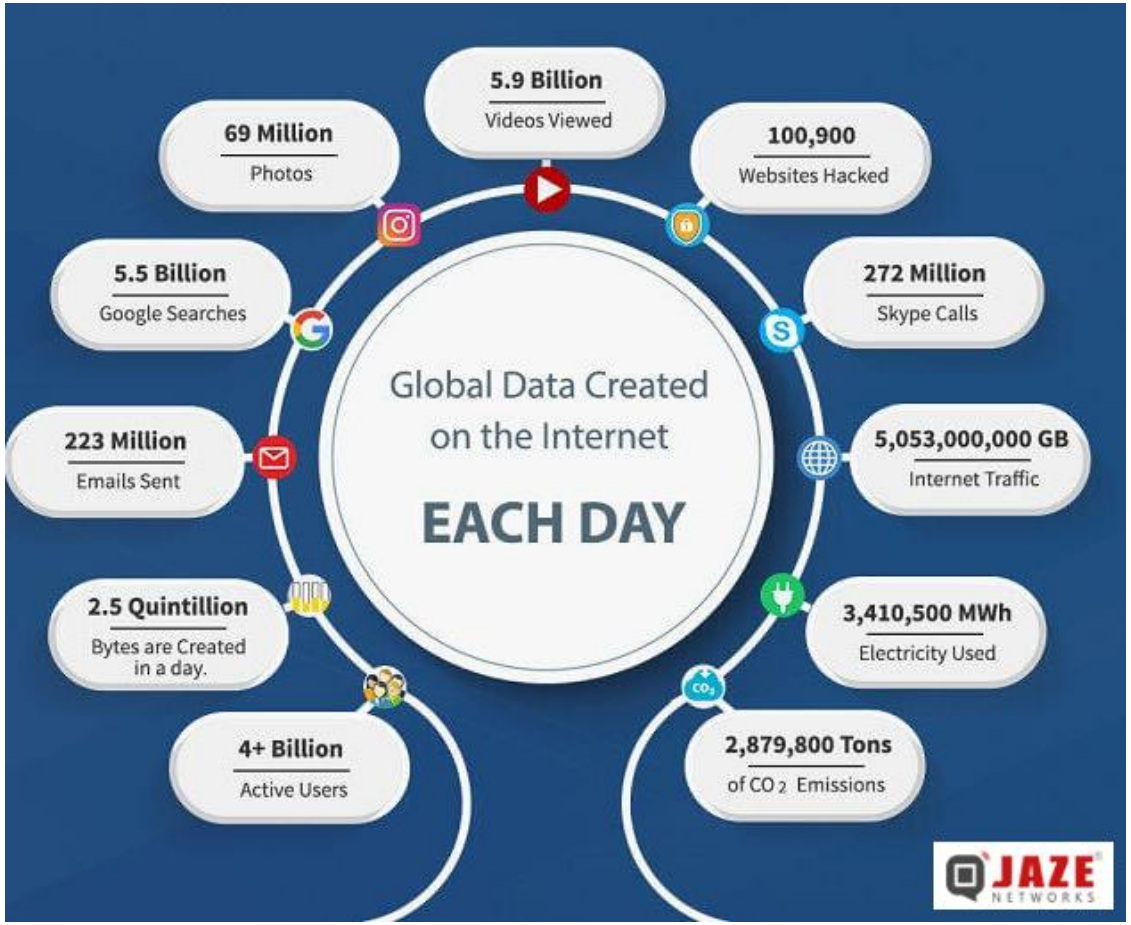



40 ZETTABYTES
[43 TRILLION GIGABYTES]
of data will be created by 2020, an increase of 300 times from 2005
2005
2020
6 BILLION PEOPLE
have cell phones
WORLD POPULATION: 7 BILLION
Volume
SCALE OF DATA
It's estimated that
2.5 QUINTILLION BYTES
[2.3 TRILLION GIGABYTES]
of data are created each day
Most companies in the U.S. have at least
100 TERABYTES
[100,000 GIGABYTES]
of data stored
The Four V's of Big Data
From traffic patterns and music downloads to web history and medical records, data is recorded, stored, and analyzed to enable the technology and services that the world relies on every day. But what exactly is big data, and how can these massive amounts of data be used?
As a leader in the sector, IBM data scientists break big data into four dimensions: Volume, Velocity, Variety and Veracity
Depending on the industry and organization, big data encompasses information from multiple internal and external sources such as transactions, social media, enterprise content, sensors and mobile devices. Companies can leverage data to adapt their products and services to better meet customer needs, optimize operations and infrastructure, and find new sources of revenue.
By 2015
4.4 MILLION IT JOBS
will be created globally to support big data, with 1.9 million in the United States
As of 2011, the global size of data in healthcare was estimated to be
150 EXABYTES
[161 BILLION GIGABYTES]
Variety
DIFFERENT FORMS OF DATA
By 2014, it's anticipated there will be
420 MILLION WEARABLE, WIRELESS HEALTH MONITORS
4 BILLION+ HOURS OF VIDEO
are watched on YouTube each month
30 BILLION PIECES OF CONTENT
are shared on Facebook every month
400 MILLION TWEETS
are sent per day by about 200 million monthly active users
The New York Stock Exchange captures
1 TB OF TRADE INFORMATION
during each trading session
Modern cars have close to
100 SENSORS
that monitor items such as fuel level and tire pressure
Velocity
ANALYSIS OF STREAMING DATA
By 2016, it is projected there will be
18.9 BILLION NETWORK CONNECTIONS
– almost 2.5 connections per person on earth
1 IN 3 BUSINESS LEADERS
don't trust the information they use to make decisions
Poor data quality costs the US economy around
$3.1 TRILLION A YEAR
27% OF RESPONDENTS
in one survey were unsure of how much of their data was inaccurate
Veracity
UNCERTAINTY OF DATA
Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPTEC, QAS
IBM



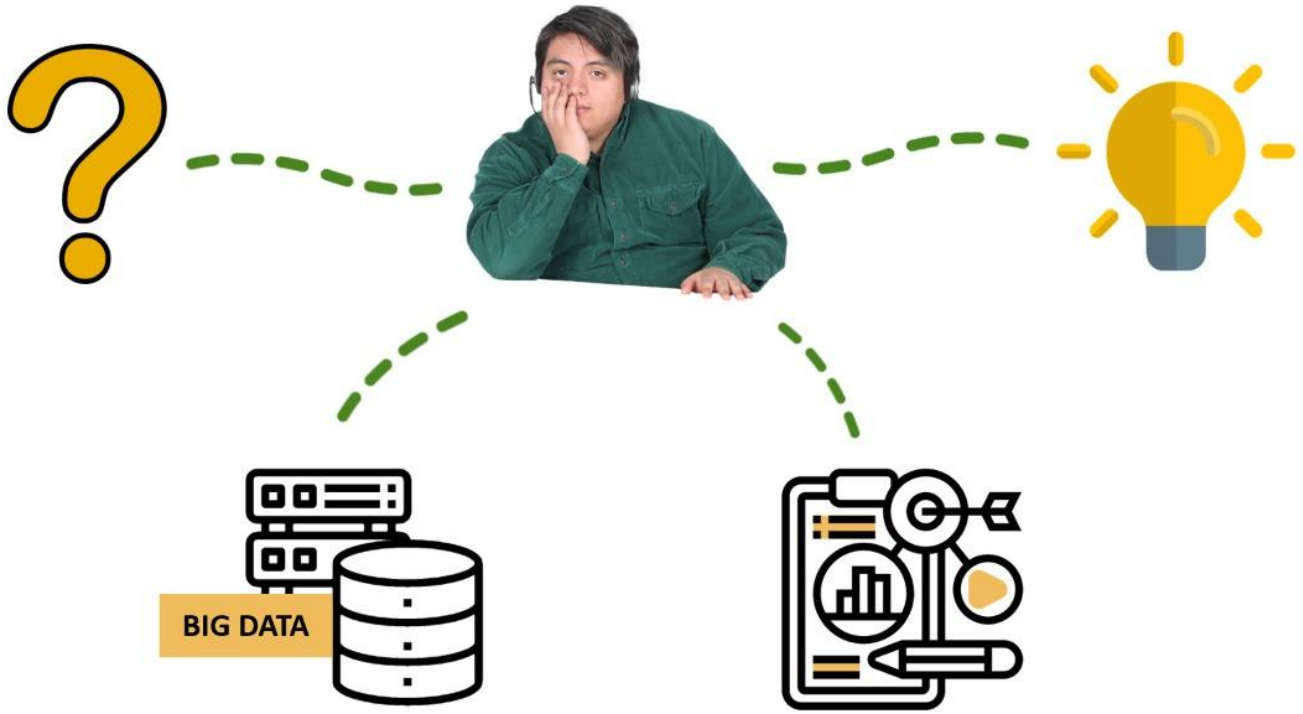
Sumber: https://lawtomated.com/structured-data-vs-unstructured-data-what-are-they-and-why-care/

Data Social Media

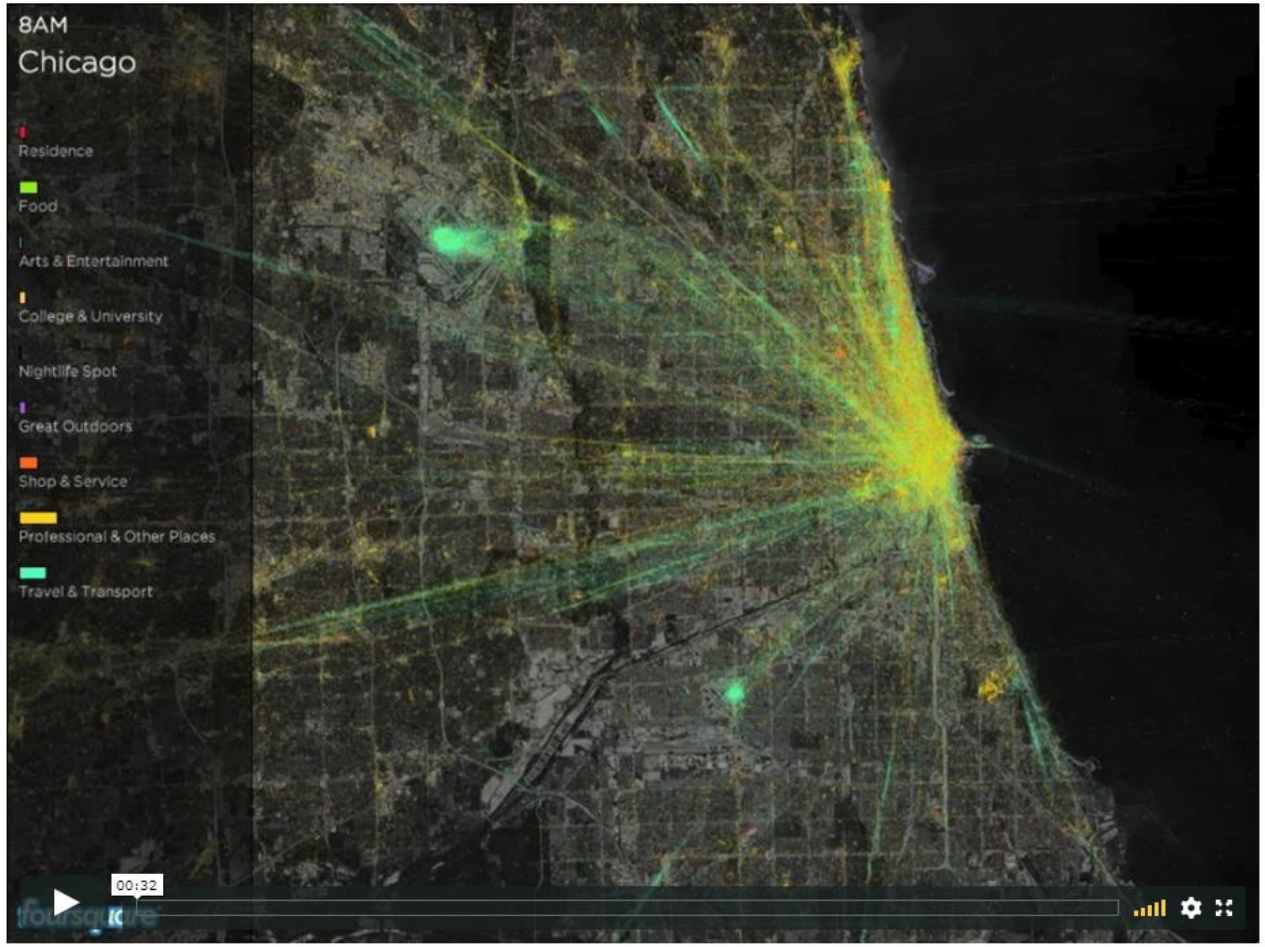


Sumber: www.jazenetworks.com

Creating Value
User Behavior Analytics



Foursquare Check In

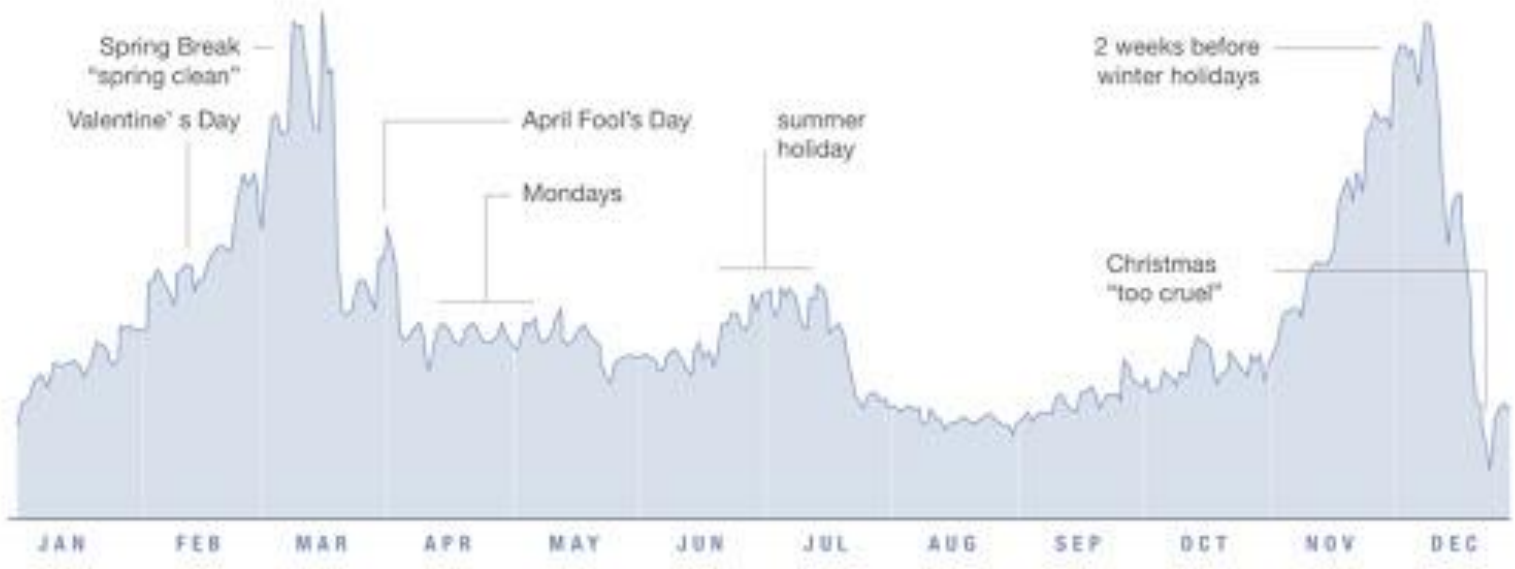


https://foursquare.com/infographics/pulse

Tweet Terkait Trump

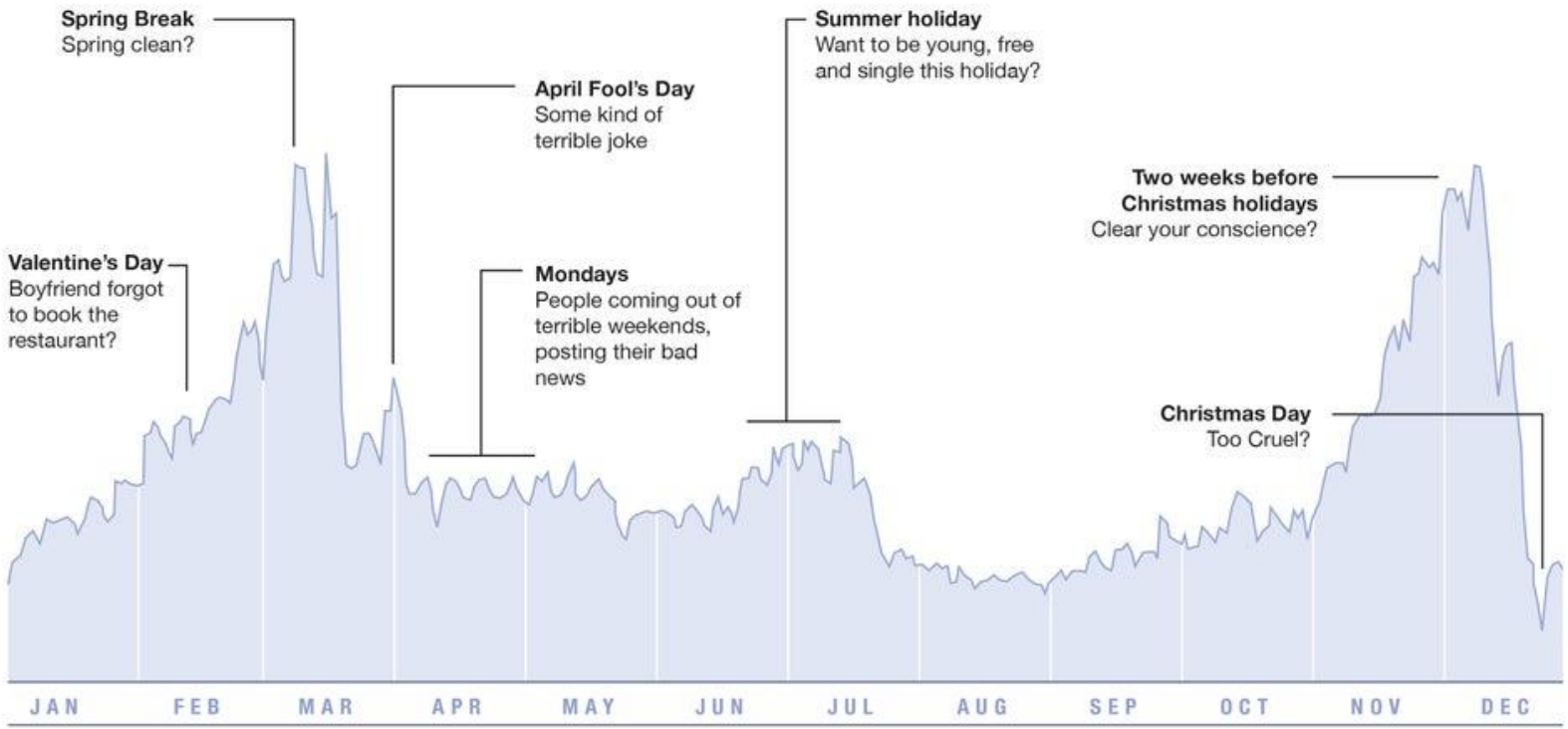
Sumber: https://www.techrepublic.com/article/a-data-visualization-of-trump-trends-on-social-media/

Pattern apa ini?



Peak Break-up Times

According to Facebook status updates



David McCandless & Lee Byron
InformationIsBeautiful.net / LeeByron.com

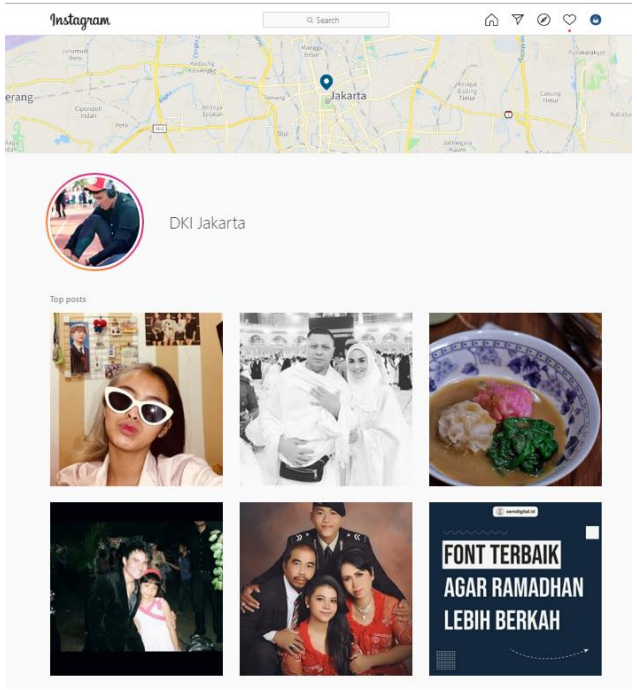
source: Facebook Lexicon 2008

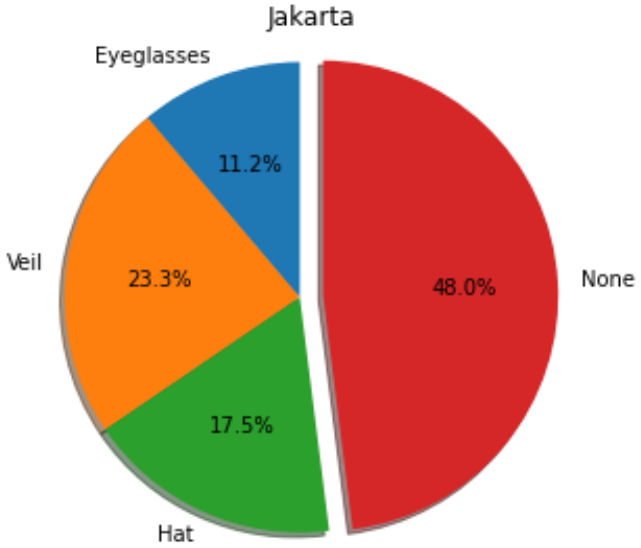
Social Media Analytics

Social Media Analytics (SMA) refers to the approach of collecting data from social media sites and blogs and evaluating that data to make business decisions.

Sumber: Wikipedia

Social Media Analytics: Instagram





Social Media Analytics: Tripadvisor

Tripadvisor

●●●●●

Bisnis trip

"Hotel dengan kamar yang sangat nyaman, breakfast lengkap dan enak. Disediakan meja kerja cocok untuk yang bisnis trip,next trip akan ajak teman dan keluarga menginap kesini lagi jika berkunjung ke bali."

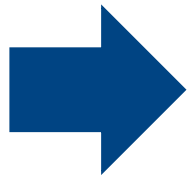
Selengkapnya

●○○○○

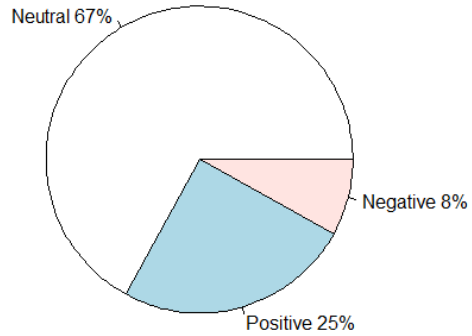
Lebih dari harga dengan Pelayanan Terburuk

"Saya menjalankan perusahaan yang berinvestasi dalam keadilan pribadi hotel, resor dan properti, yang memberi saya banyak pengalaman ribuan hotel yang berbeda di seluruh dunia. Tapi aku menyesal untuk mengatakan bahwa Katamama disajikan saya dengan pengalaman terburuk di akomodasi dengan harga tertinggi yang pernah saya alami dalam tahun. Saya menginap di suite di atap untuk melihat dan meningkatkan kemampuan mereka di atas layanan dan fasilitas. Saya dapat mengatakan saya pengalaman terburuk di bawah tiga hal: 1. Fasilitas Berbahaya 2. Lingkungan yang keras 3. Pelayanan Tidak Profesional Pertama, fasilitas sangat modern yang terlihat sedang dibangun oleh grup F & menjadi populer di Potato Head. Namun ketika Anda melihat mereka secara detail, Anda akan

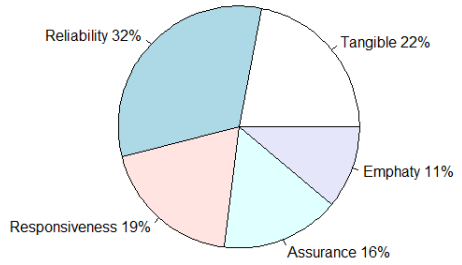
Selengkapnya



Sentiment Analyisis

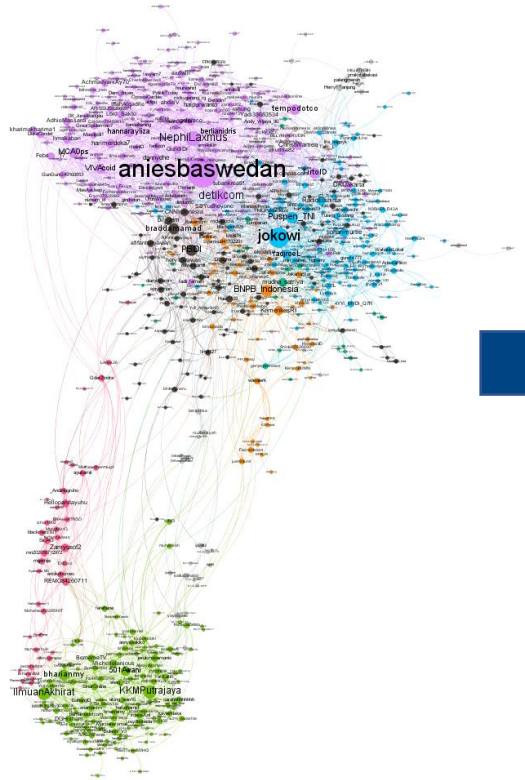


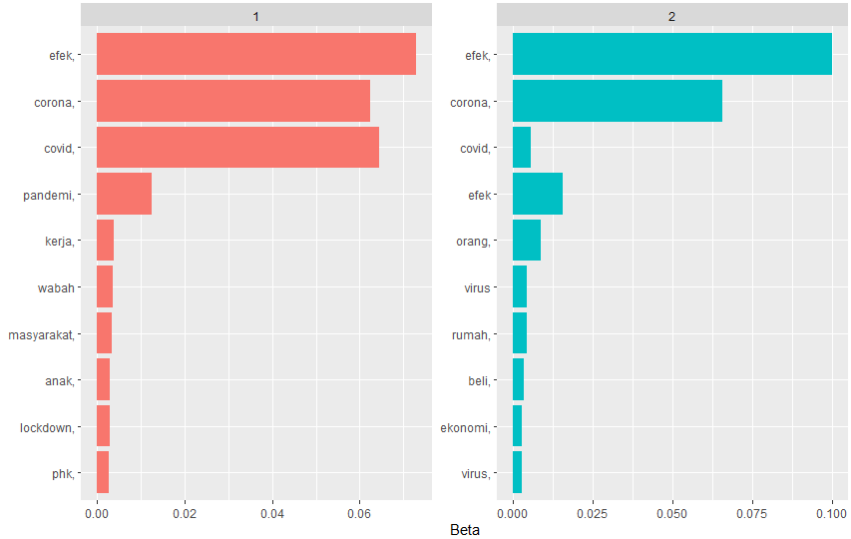
Service Quality Dimention - Negative



Social Media Analytics: Twitter

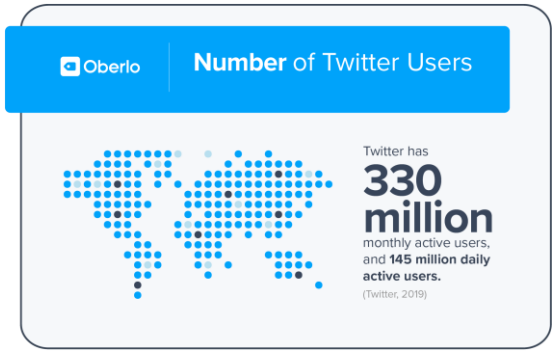
MENGANALISA KONTEN PERCAKAPAN

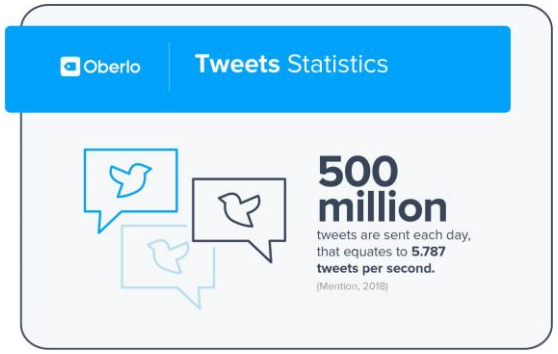




Twitter

Twitter merupakan layanan jejaring sosial dan mikroblog daring yang memungkinkan penggunanya untuk mengirim dan membaca pesan berbasis teks hingga 140 karakter akan tetapi pada tanggal 07 November 2017 bertambah hingga 280 karakter yang dikenal dengan sebutan kicauan (tweet).





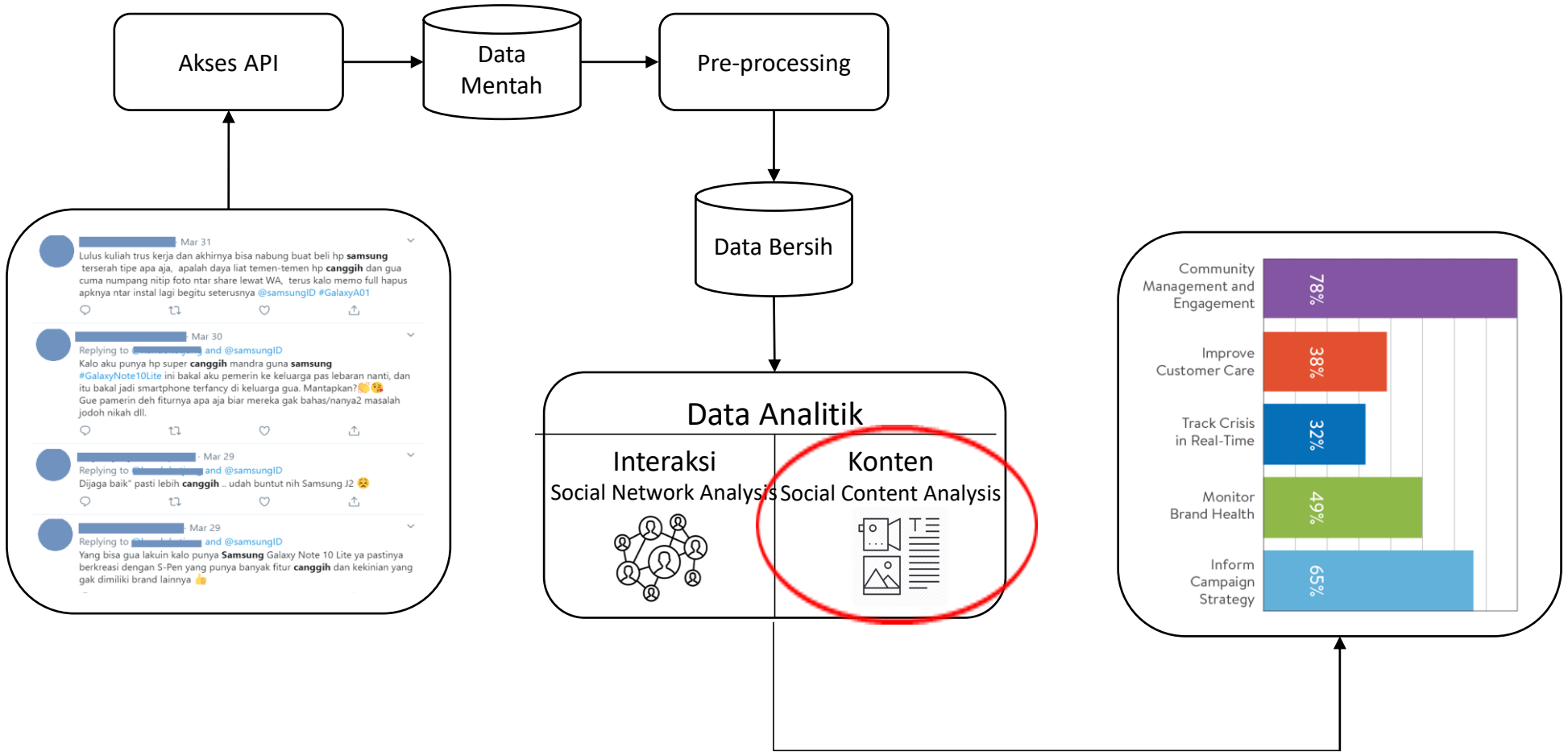
Kelebihan dan Kekurangan

Kelebihan	Kekurangan
• TwitterAPI terbuka dan dapat diakses • Mudah menemukan percakapan karena adanya fitur Hashtag • Lebih mudah dikontrol dan dianalisa, karena jumlah tweet terbatas.	• Adanya batasan pengambilan data untuk akun gratis • Tweet yang memilik memiliki penandaan geografis dangat sedikit (1%)

Penggunaan Data Twitter

- Mengidentifikasi trending topik
- Menganalisa opini pelanggan
- Menganalisa sentiment public
- Milihat capaian sebuah merek
- Deteksi Event

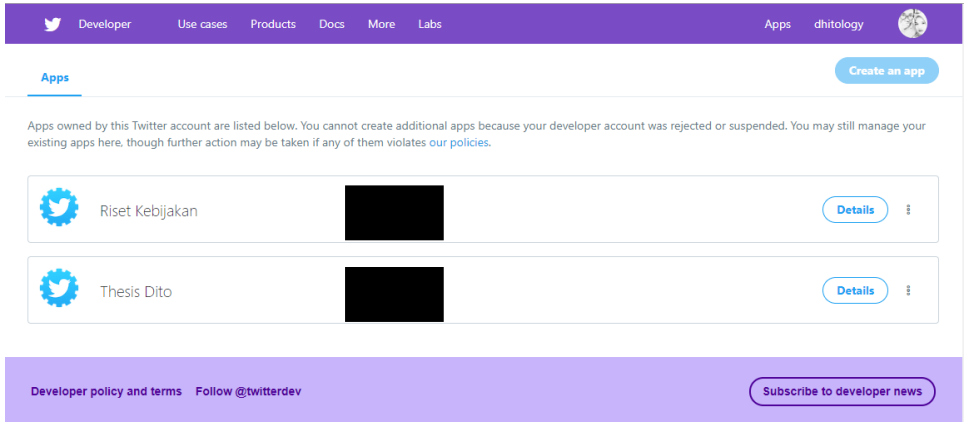
Framework


Akses API
Data Mentah
Pre-processing
Data Bersih
Mar 31
Lulus kuliah trus kerja dan akhirnya bisa nabung buat beli hp samsung terserah tipe apa aja, apalah daya liat temen-temen hp canggih dan gua cuma numpang nitip foto ntar share lewat WA, terus kalo memo full hapus apknya ntar instal lagi begitu seterusnya @samsungID #GalaxyA01
Mar 30
Replying to and @samsungID
Kalo aku punya hp super canggih mandra guna samsung #GalaxyNote10Lite ini bakal aku pemerin ke keluarga pas lebaran nanti, dan itu bakal jadi smartphone terfancy di keluarga gua. Mantapkan?
Gue pamerin deh fiturnya apa aja biar mereka gak bahas/nanya2 masalah jodoh nikah dll.
Mar 29
Replying to and @samsungID
Dijaga baik" pasti lebih canggih .. udah buntut nih Samsung J2
Mar 29
Replying to and @samsungID
Yang bisa gua lakuin kalo punya Samsung Galaxy Note 10 Lite ya pastinya berkreasi dengan S-Pen yang punya banyak fitur canggih dan kekinian yang gak dimiliki brand lainnya
Data Analitik
Interaksi
Social Network Analysis
Konten
Social Content Analysis
Community Management and Engagement
78%
Improve Customer Care
38%
Track Crisis in Real-Time
32%
Monitor Brand Health
49%
Inform Campaign Strategy
65%

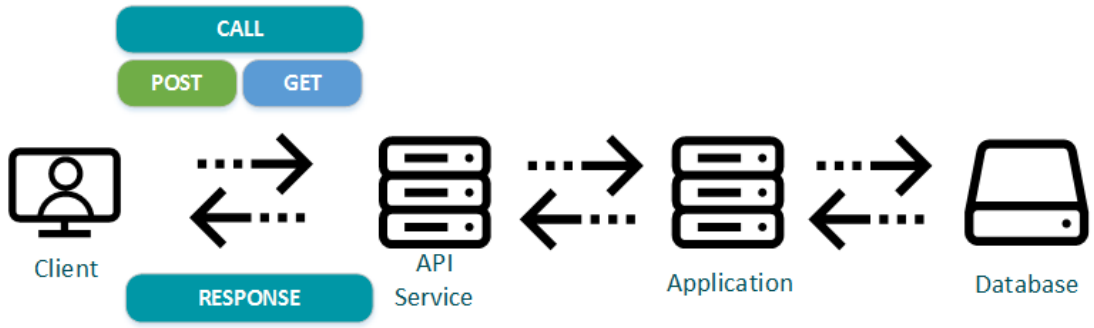
Mengambil Data Media Sosial

1. Mengambil di database internal
2. Melalui API
3. Scrapping
4. Screaming/Praying (Optional)

Twitter API



Membuat Twitter API: http://apps.twitter.com/



Sumber: https://help.eset.com/ema/2/api/en-US/how_api_works.html

Rtweet

rtweet

build passing | CRAN 0.7.0 | codecov 64% | DOI 10.5281/zenodo.2528481 | Peer Reviewed
repo status Active | downloads 13K/month | downloads 180K | lifecycle maturing | JOSS 10.21105/joss.01829

R client for accessing Twitter's REST and stream APIs. Check out the rtweet package documentation website.

Task	rtweet	twitteR	streamR	RTwitterA
Available on CRAN	✅	✅	✅	❌
Updated since 2016	✅	❌	✅	❌
Non-'developer' access	✅	❌	❌	❌
Extended tweets (280 chars)	✅	❌	✅	❌
Parses JSON data	✅	✅	✅	❌
Converts to data frames	✅	✅	✅	❌
Automated pagination	✅	❌	❌	❌
Search tweets	✅	✅	❌	❓
Search users	✅	❌	❌	❓
Stream sample	✅	❌	✅	❌
Stream keywords	✅	❌	✅	❌
Stream users	✅	❌	✅	❌
Get friends	✅	✅	❌	✅
Get timelines	✅	✅	❌	❓
Get mentions	✅	✅	❌	❓
Get favorites	✅	✅	❌	❓

Get trends	✅	✅	❌	❓
Get list members	✅	❌	❌	❓
Get list memberships	✅	❌	❌	❓
Get list statuses	✅	❌	❌	❓
Get list subscribers	✅	❌	❌	❓
Get list subscriptions	✅	❌	❌	❓
Get list users	✅	❌	❌	❓
Lookup collections	✅	❌	❌	❓
Lookup friendships	✅	✅	❌	❓
Lookup statuses	✅	✅	❌	❓
Lookup users	✅	✅	❌	❓
Get retweeters	✅	✅	❌	❓
Get retweets	✅	✅	❌	❓
Post tweets	✅	✅	❌	❌
Post favorite	✅	❌	❌	❌
Post follow	✅	❌	❌	❌
Post messsage	✅	✅	❌	❌
Post mute	✅	❌	❌	❌
Premium 30 day	✅	❌	❌	❌
Premium full archive	✅	❌	❌	❌

```
 [1] "user_id"                 "status_id"               "created_at"
 [4] "screen_name"             "text"                    "source"
 [7] "display_text_width"      "reply_to_status_id"      "reply_to_user_id"
[10] "reply_to_screen_name"    "is_quote"                "is_retweet"
[13] "favorite_count"          "retweet_count"           "quote_count"
[16] "reply_count"             "hashtags"                "symbols"
[19] "urls_url"                "urls_t.co"               "urls_expanded_url"
[22] "media_url"               "media_t.co"              "media_expanded_url"
[25] "media_type"              "ext_media_url"           "ext_media_t.co"
[28] "ext_media_expanded_url"  "ext_media_type"          "mentions_user_id"
[31] "mentions_screen_name"    "lang"                    "quoted_status_id"
[34] "quoted_text"             "quoted_created_at"       "quoted_source"
[37] "quoted_favorite_count"   "quoted_retweet_count"   "quoted_user_id"
[40] "quoted_screen_name"      "quoted_name"             "quoted_followers_count"
[43] "quoted_friends_count"    "quoted_statuses_count"   "quoted_location"
[46] "quoted_description"      "quoted_verified"         "retweet_status_id"
[49] "retweet_text"            "retweet_created_at"      "retweet_source"
[52] "retweet_favorite_count"  "retweet_retweet_count"   "retweet_user_id"
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[58] "retweet_friends_count"   "retweet_statuses_count" "retweet_location"
[61] "retweet_description"     "retweet_verified"        "place_url"
[64] "place_name"              "place_full_name"         "place_type"
[67] "country"                 "country_code"            "geo_coords"
[70] "coords_coords"           "bbox_coords"             "status_url"
[73] "name"                    "location"                "description"
[76] "url"                     "protected"               "followers_count"
[79] "friends_count"           "listed_count"            "statuses_count"
[82] "favourites_count"        "account_created_at"      "verified"
[85] "profile_url"             "profile_expanded_url"    "account_lang"
[88] "profile_banner_url"      "profile_background_url"  "profile_image_url"
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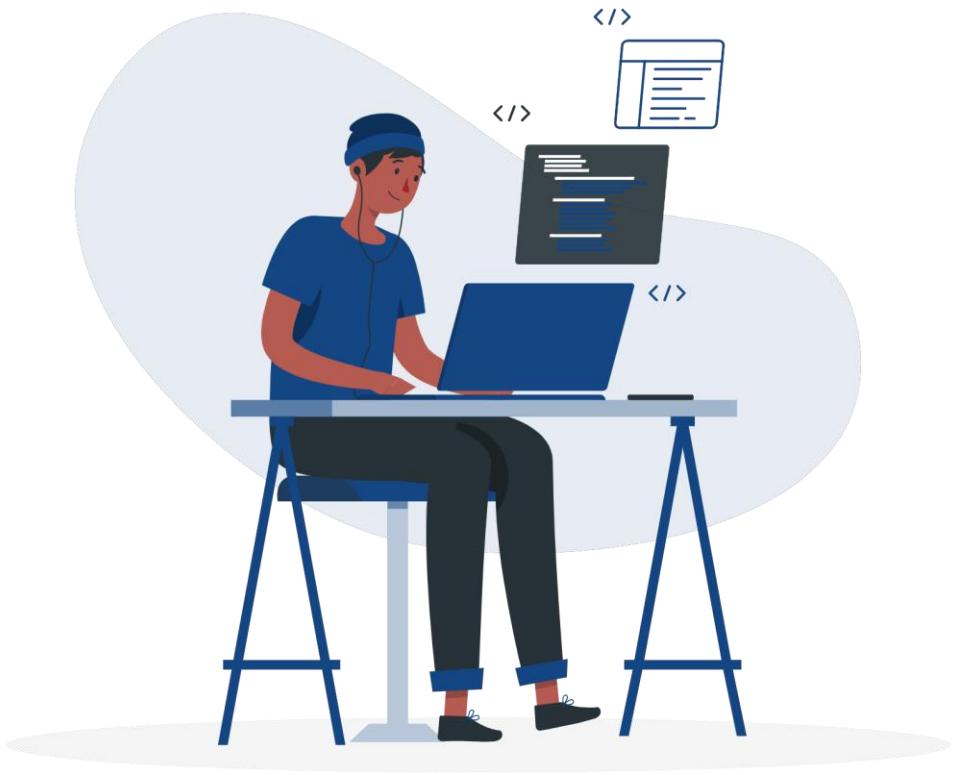


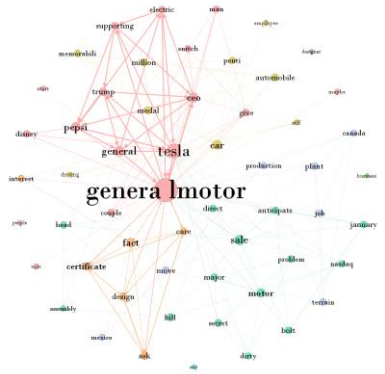
Yuk, Praktek

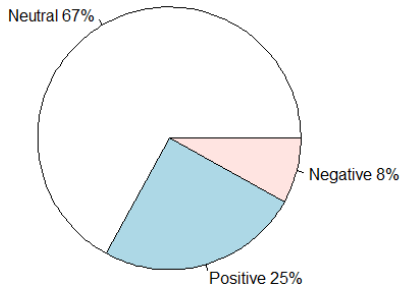
Biar lebih ngerti

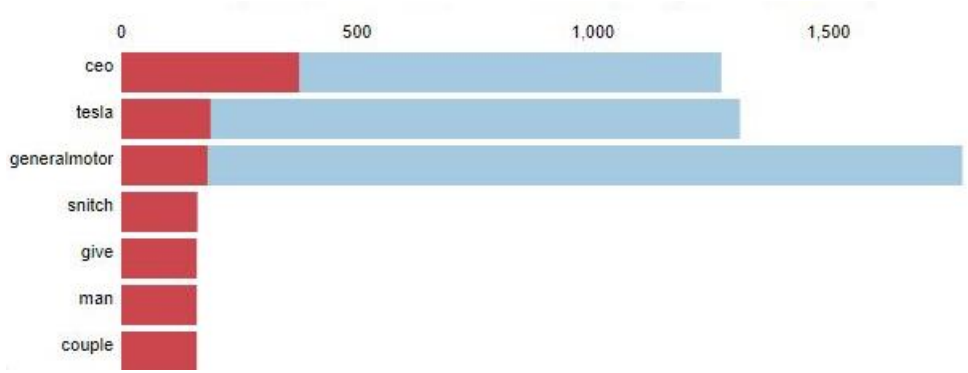
Text Mining

- **Text Mining** merupakan proses ekstraksi pola berupa informasi dan pengetahuan yang berguna dari sejumlah besar sumber data teks, seperti dokumen Word, PDF, kutipanteks, dll. *(Wikipedia)*

- **Natural Language Processing(NLP) merupakan** cabang ilmu komputer dan linguistik yang mengkaji interaksi antara komputer dengan bahasa (alami) manusia. NLP merupakan salah satu komponen Text Mining yang melakukan analisis linguistik untuk membantu mesin agar "membaca" teks.





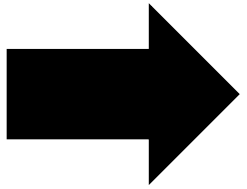


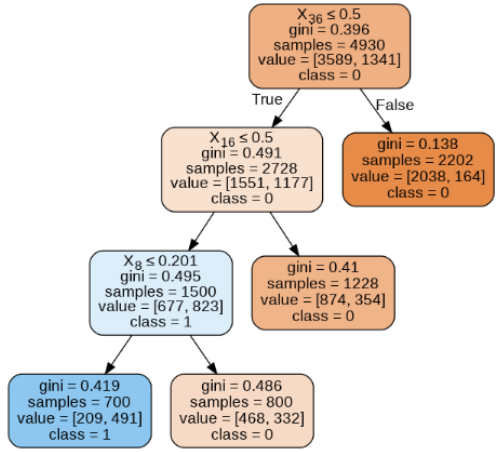
Text Mining dan Data Mining

MENGANALISA KONTEN PERCAKAPAN

Data Mining

customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService
7590-VHVEG	Female	No	Yes	No	1	No	No phone service	DSL
5575-GNVDE	Male	No	No	No	34	Yes	No	DSL
3668-QPYBK	Male	No	No	No	2	Yes	No	DSL
7795-CFOCW	Male	No	No	No	45	No	No phone service	DSL
9237-HQITU	Female	No	No	No	2	Yes	No	Fiber optic
9305-CDSKC	Female	No	No	No	8	Yes	Yes	Fiber optic
1452-KIOVK	Male	No	No	Yes	22	Yes	Yes	Fiber optic
6713-OKOMC	Female	No	No	No	10	No	No phone service	DSL
7892-POOKP	Female	No	Yes	No	28	Yes	Yes	Fiber optic
6388-TABGU	Male	No	No	Yes	62	Yes	No	DSL
9763-GRSKD	Male	No	Yes	Yes	13	Yes	No	DSL
7469-LKBCI	Male	No	No	No	16	Yes	No	No
8091-TTVAX	Male	No	Yes	No	58	Yes	Yes	Fiber optic
0280-XJGEX	Male	No	No	No	49	Yes	Yes	Fiber optic
5129-JLPIS	Male	No	No	No	25	Yes	No	Fiber optic

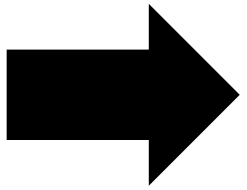




Text Mining

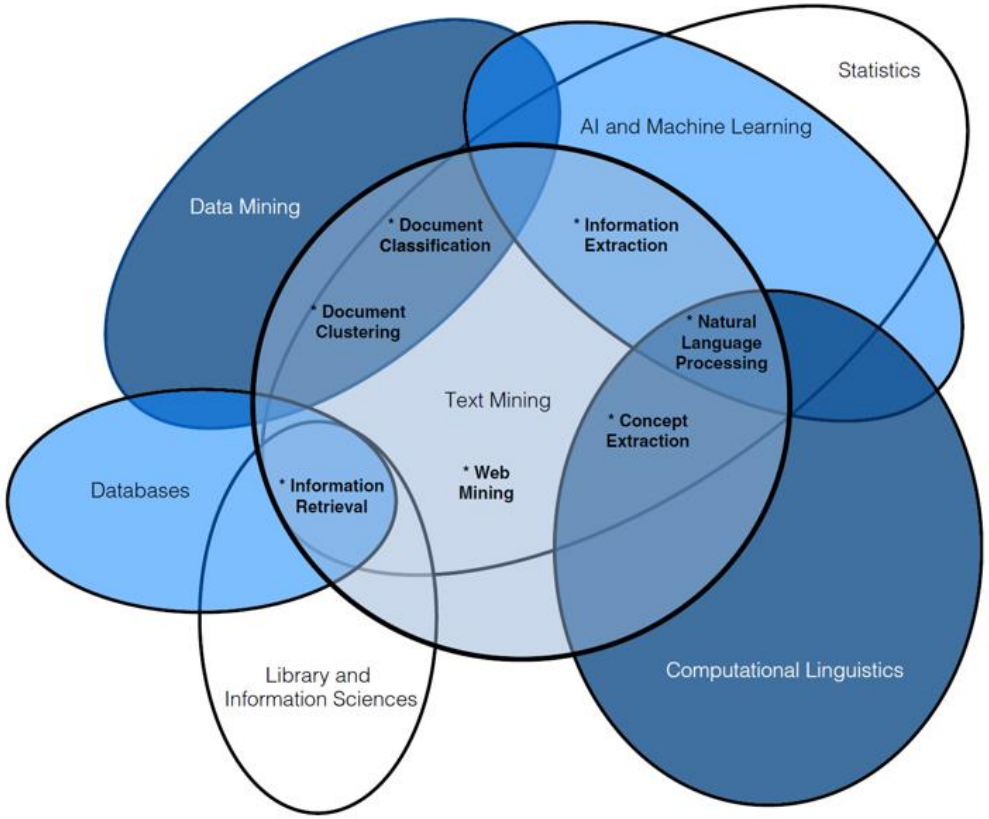
Sebelum ricuh, perwakilan mahasiswa sudah diterima pimpinan DPRD untuk menyampaikan aspirasinya. Aparat keamanan kemudian mengimbau massa agar tak mendesak masuk gedung dewan. Namun imbauan itu tak diindahkan mahasiswa.

Bersamaan dengan lemparan botol, batu, sepatu dan barang-barang lainnya, mahasiswa yang berada depan pagar merangsek masuk. Pagar yang tadinya menyekat mahasiswa dengan aparat keamanan akhirnya jebol.



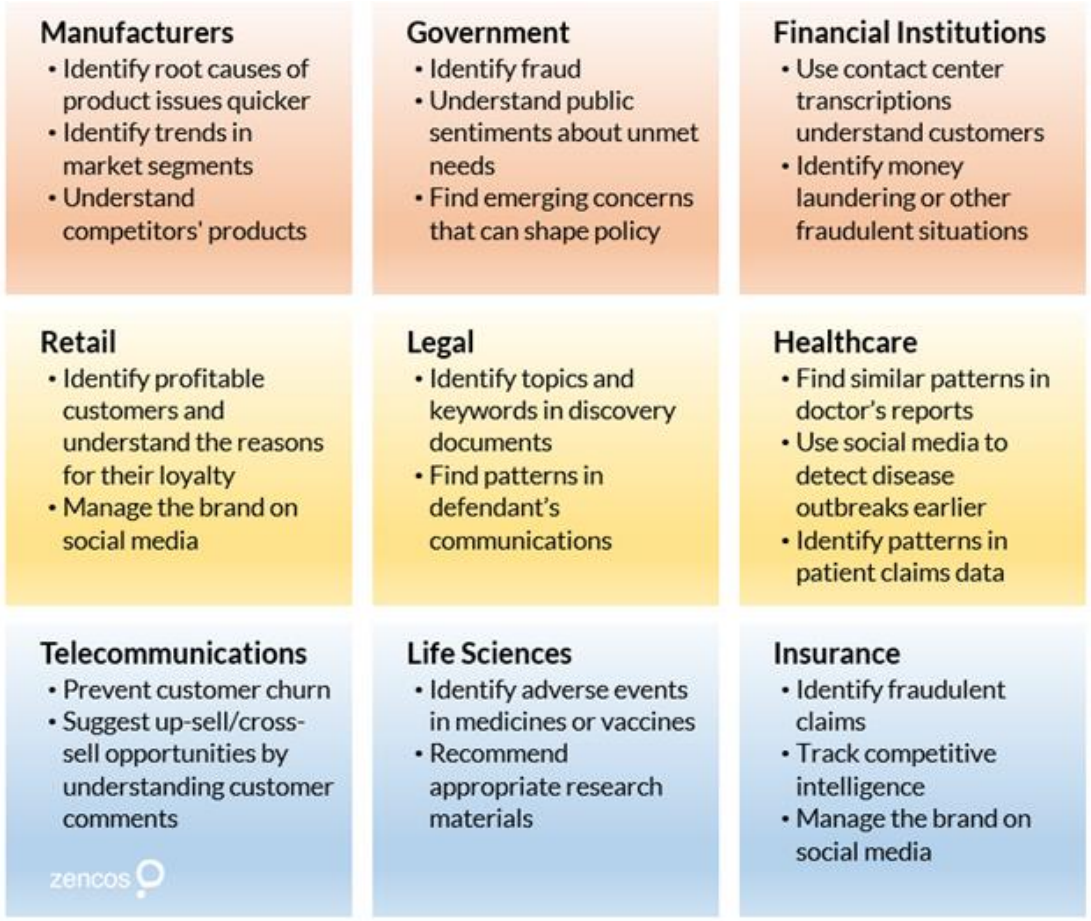
Important Keyword:
Ricuh
Mahasiswa
DPR
Aparat
Desak
Masuk

The Big Picture



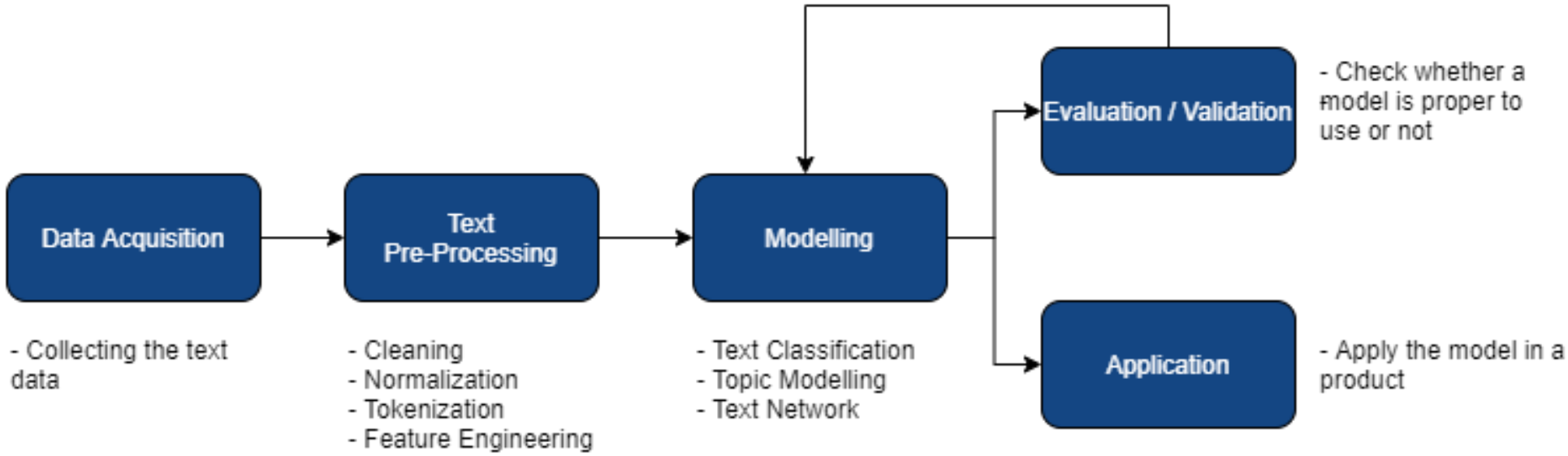
Sumber: The Seven Practice Areas of Text Analytics

Aplikasi Text Mining



Sumber: https://www.zencos.com/blog/text-mining-examples-advanced-analytics/

Proses Text Mining



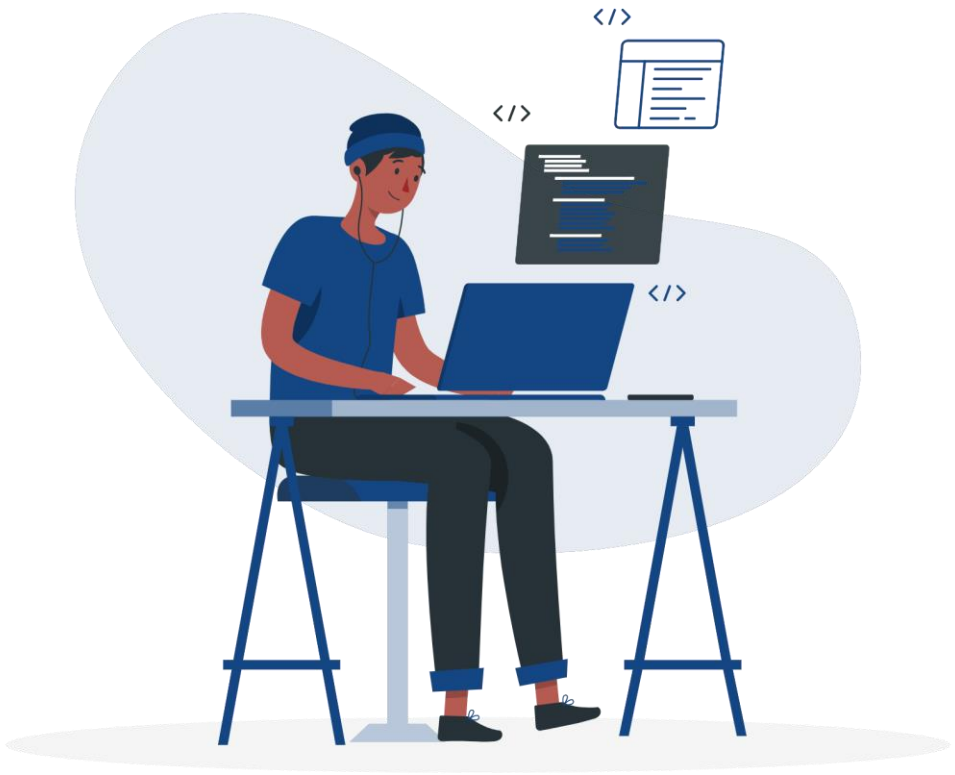
Wordcloud

Wordcloud merupakan salah satu teknik visualisasi kata untuk melihat frekuensi masing-masing kata pada keseluruhan dokumen.

	word	freq
bahasa	bahasa	18.790670
indonesia	indonesia	18.136450
trending	trending	14.633601
pesona	pesona	11.183825
orang	orang	10.488977
raya	raya	10.100387
aceh	aceh	10.010657
sabar	sabar	8.961507
kisah	kisah	8.434360
negara	negara	8.166458

Text Network Analytics

- **Text Network Analysis** memetakan hubungan antar kata yang dapat memberikan gambaran besar terkait isi dari sebuah dokumen.

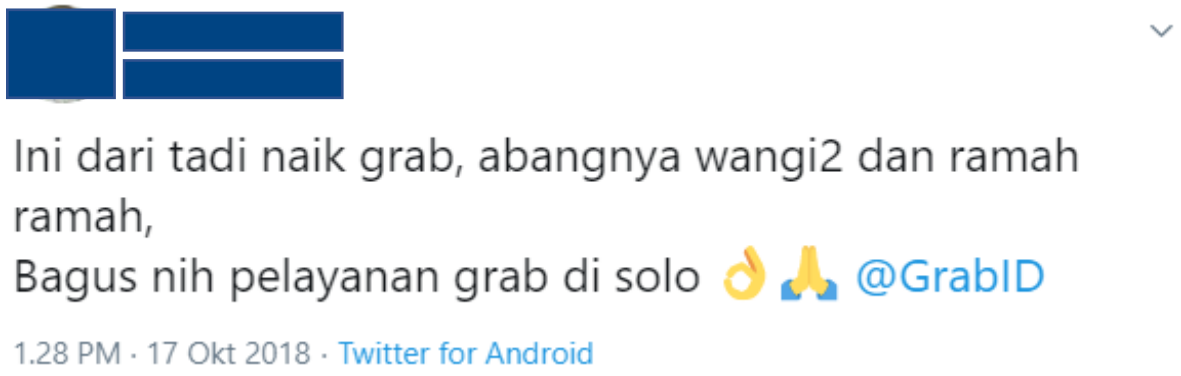


Yuk, Praktek

Biar lebih ngerti

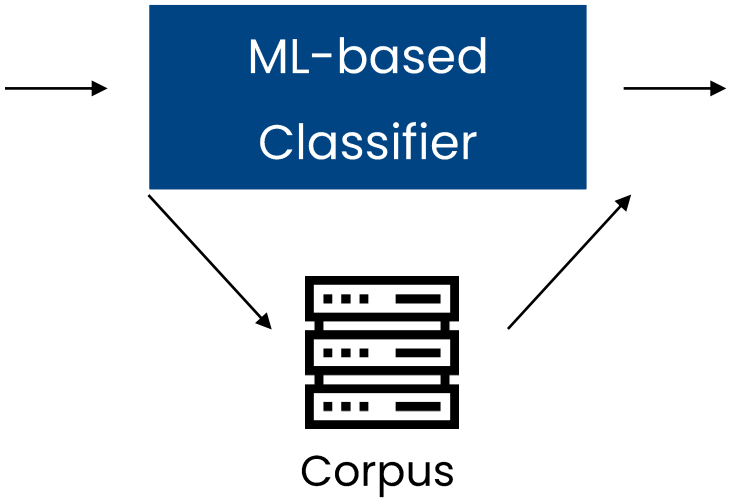
Text Classification

Text Classification atau klasifikasi text merupakan proses mengkategorikan dokumen atau kalimat kedalam sebuah label kelas tertentu. Contoh penerapan Text classification yang umum digunakan adalah Sentiment Analysis.



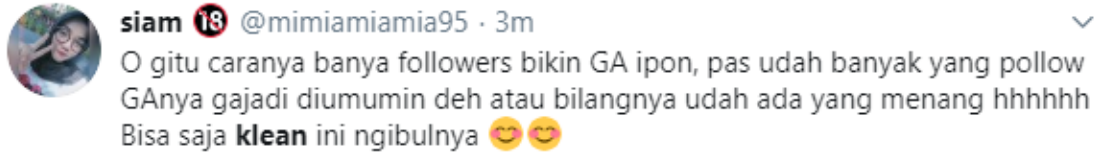
Sentiment Analysis

Tweets	Sentiment
kartu yg sdh sukses diregistrasi ttp di reject saat bayar via grabpay?mslh baru timbul semingguan terakhir	Negative
halo Grab kenapa ya lokasi ko ga kedetect dari tadi? sy mo order ga bisa	Negative
pengemudi payah..ambil penumpang dr bandara sll cancel!	Negative
apa pembatalan sama dengan order yang tidak di ambil?	Negative
klo mau ganti no rek cimb kemana ya? troubleshootnya lambat menanggapinya	Negative
SECEPAT datangnya GRAB\ud83d\02 Buruan pake !! Radiovenusmks	Neutral
min mau top up grabpay di alfamart sistemnya eror tuh	Negative



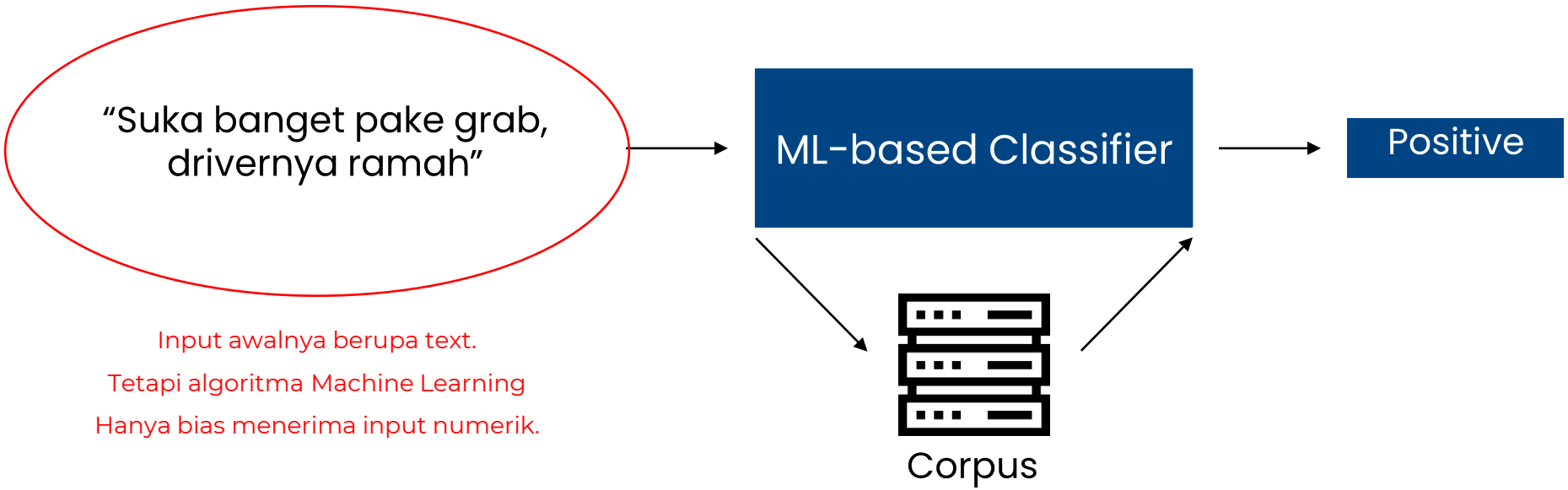
Tweets	Sentiment	Predicted Sentiment
tidak bisa dipakai sama sekali saldonya. Mohon di kroscek ya		Negative
aplikasi grab kok gbsa ya? Keluar sendiri pas d klik		Negative
halo kenapa applikasi grab saya selalu ketutup sendiri stlh order grabfood ya? Saya jd tdk bisa hub drivernya		Negative
I can't access Grabchat. May I know why?		Negative
kalo pesen grabfood..kdg di app open..tp aslinya close. driver nya suka kayak bete gt ditelfon seolah olah kt yg salah ya haha		Negative
halo dari kemarin kalo jam segini mau pesen grab selalu \failed to contact the Grab server\ padahal kalo pagi ga ada masalah		Negative

Problem 1: Uncleaned Text



Tipe Pre-Precessing	Hasil
Tokenization	O gitu caranya banya followers bikin GA ipon, pas sudah banyak yang pollow GAnya gajadi diumumin deh atau bilangnya sudah ada yang menang hhhhhh Bisa saja klean ini ngibulnya
Slang word	O gitu caranya banyak followers bikin GA iphone, pas sudah banyak yang follow GAnya tidak jadi diumumin deh atau bilangnya sudah ada yang menang hhhhhh Bisa saja kalian ini ngibulnya
Stemming	O gitu cara banyak followers bikin GA iphone, pas sudah banyak yang follow GA tidak jadi umum deh atau bilang sudah ada yang menang hhhhhh Bisa saja kalian ini ngibul
Lemmatization	O gitu cara banyak followers buat GA iphone, pas sudah banyak yang follow GA tidak jadi umum deh atau sebut sudah ada yang menang hhhhhh Bisa saja kalian ini tipu
Stop word	cara banyak followers GA iphone, banyak follow GA tidak umum sebut menang kalian tipu.

Problem 2: Numerical Input



Input awalnya berupa text.

Tetapi algoritma Machine Learning

Hanya bias menerima input numerik.

Text Vectorization

D = aku suka menggunakan grab karena murah

Tokenize

("aku", "suka ", "menggunakan", "grab" , "karena", "murah")

W = Word (Text)

X = Some numeric encoding of Word

D = X1, X2, X3, ... Xn

Text Vectorization

Teknik Popular:

- One-Hot Encoding
- Frequency-Based Encoding: (TF-IDF, Co-occurrence)
- Prediction-Based Encoding: (Lda2Vec)

One Hot Encoding

Tweet
Direkomendasikan banget nih
Drivernya bau
Ramah banget
Gak bakal naik lagi

Semua Kata
Direkomendasikan
Banget
Nih
Drivernya
Bau
Ramah
Gak
Bakal
Naik
Lagi

One Hot Encoding

Semua Kata	Direkomendasikan banget nih	Drivernya bau	Ramah banget
direkomendasikan	**1**	0	0
banget	**1**	0	**1**
nih	**1**	0	0
drivernya	0	**1**	0
bau	0	**1**	0
ramah	0	0	**1**
gak	0	0	0
bakal	0	0	0
naik	0	0	0
lagi	0	0	0

Frequency Based Encoding

Teknik Popular

- **Count:** Melihat seberapa sering sebuah kata muncul di sebuah dokumen.
- **TF-IDF:** Melihat seberapa sering sebuah kata muncul di sebuah dokumen dan juga di keseluruhan dokumen.
- **Co-occurrence:** Kata yang sering mucncul Bersama memiliki konteks yang sama.

TF-IDF

TF-IDF: Melihat seberapa sering sebuah kata muncul di sebuah dokumen dan juga di keseluruhan corpus.

$$Xi = tf(Wi) \times idf(wi)$$

tf = (Number of repetitions of word in a document) / (# of words in a document)

idf =Log[(# Number of documents) / (Number of documents containing the word)] and

TF-IDF

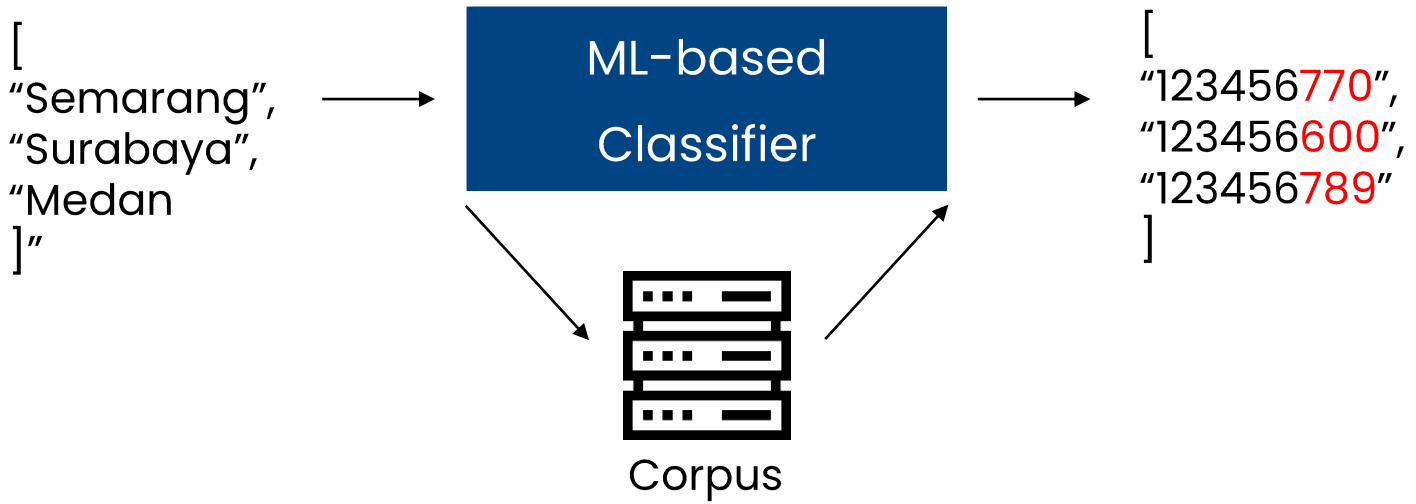
Semakin sering disebuah dokumen

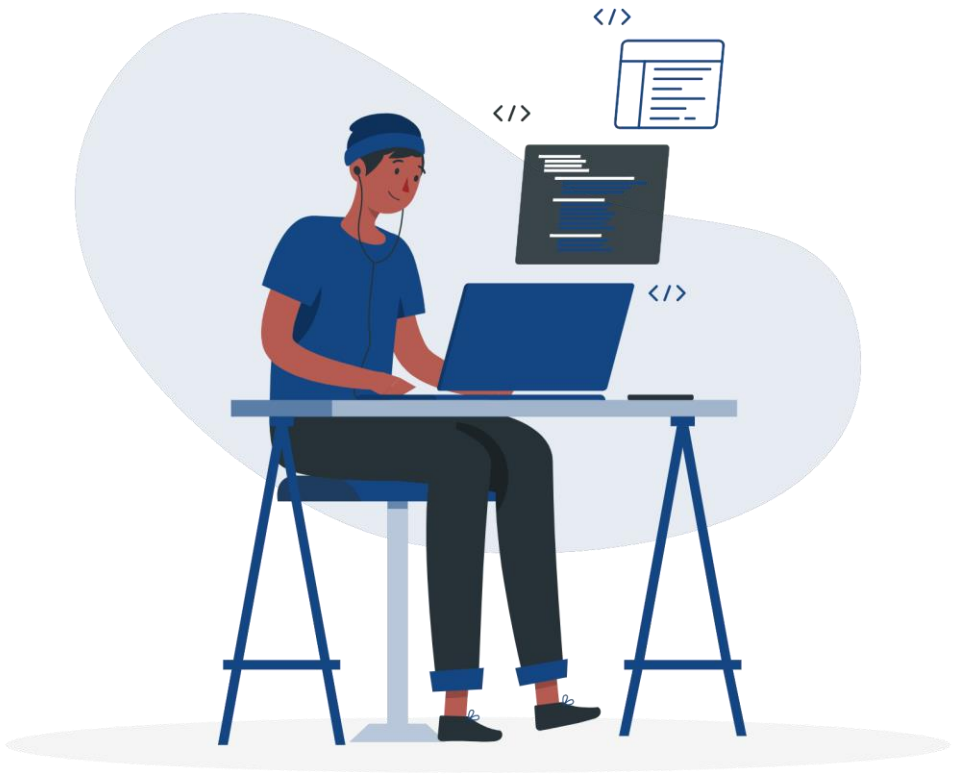
Kemungkinan kata yang penting

Semakin sering muncul disemua dokumen

Kemungkinan kata yang biasa digunakan

Prediction Based Ecoding





Yuk, Praktek

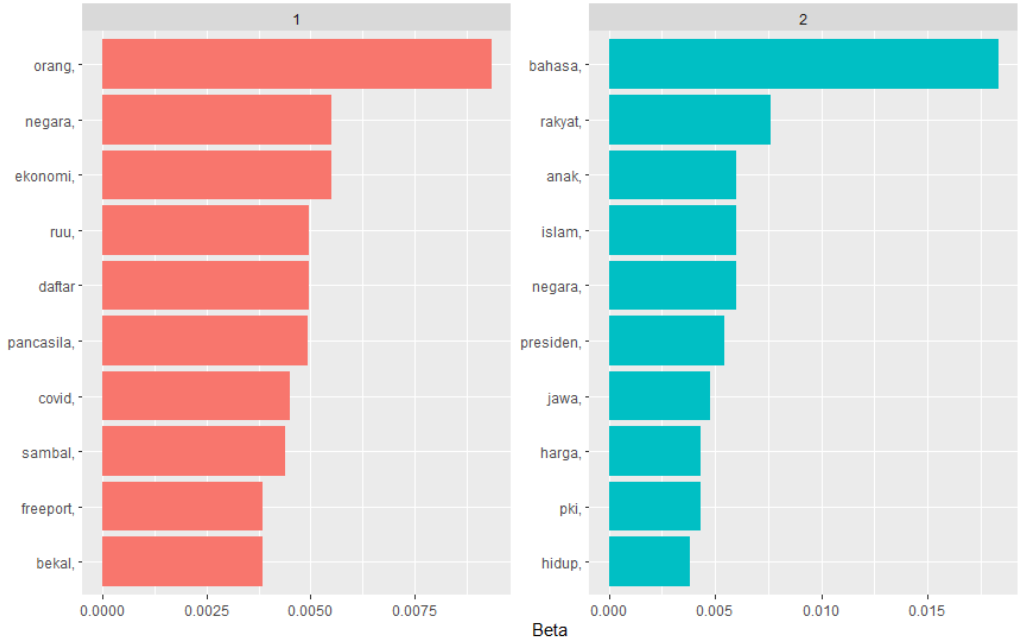
Biar lebih ngerti

Topic Modelling

Topic model merupakan salah sah satu metode statistic untuk mengektraksi topik dari sebuah/kumpulan dokumen.

Teknik Popular:

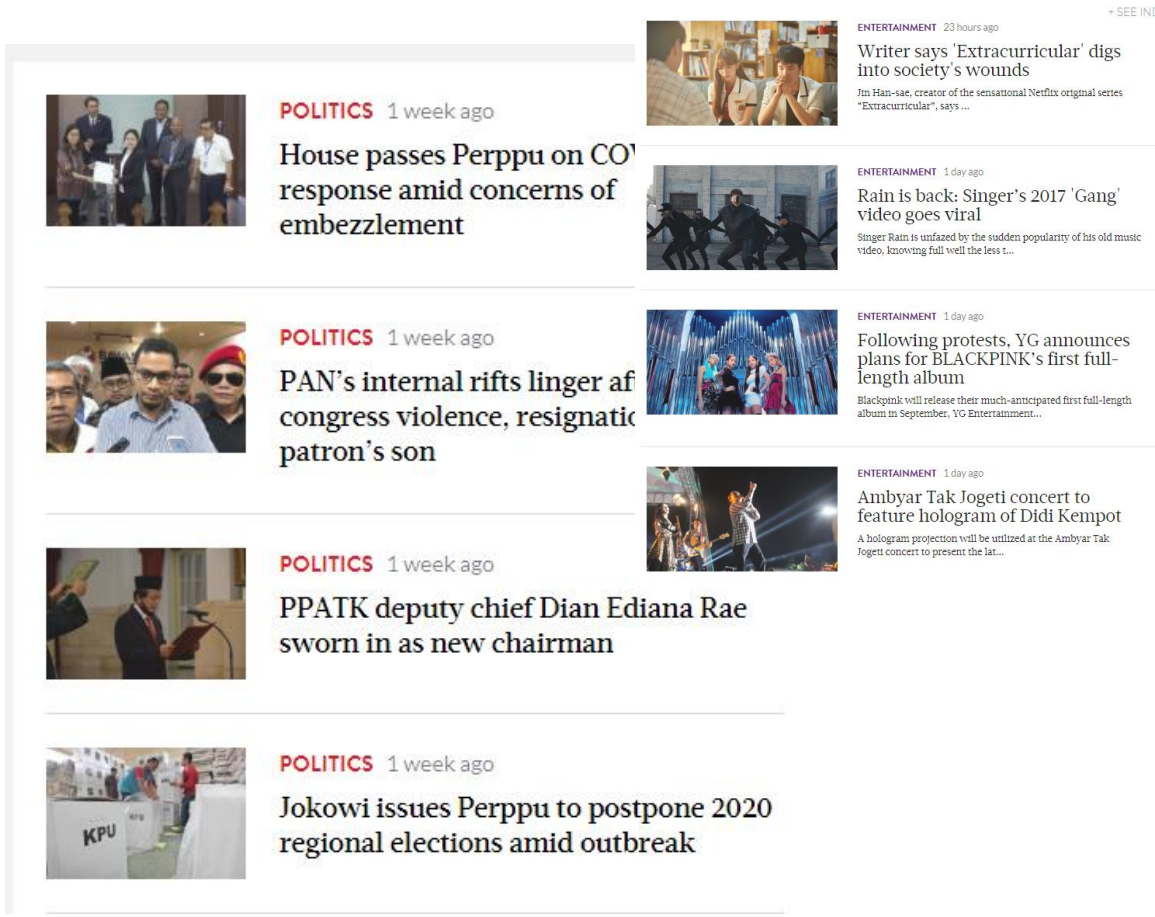
- Latent Semantic Analysis (LSA)
- Probabilistic Latent Semantic Analysis (PLSA)
- **Latent Dirichlet Allocation (LDA)**
- Lda2vec



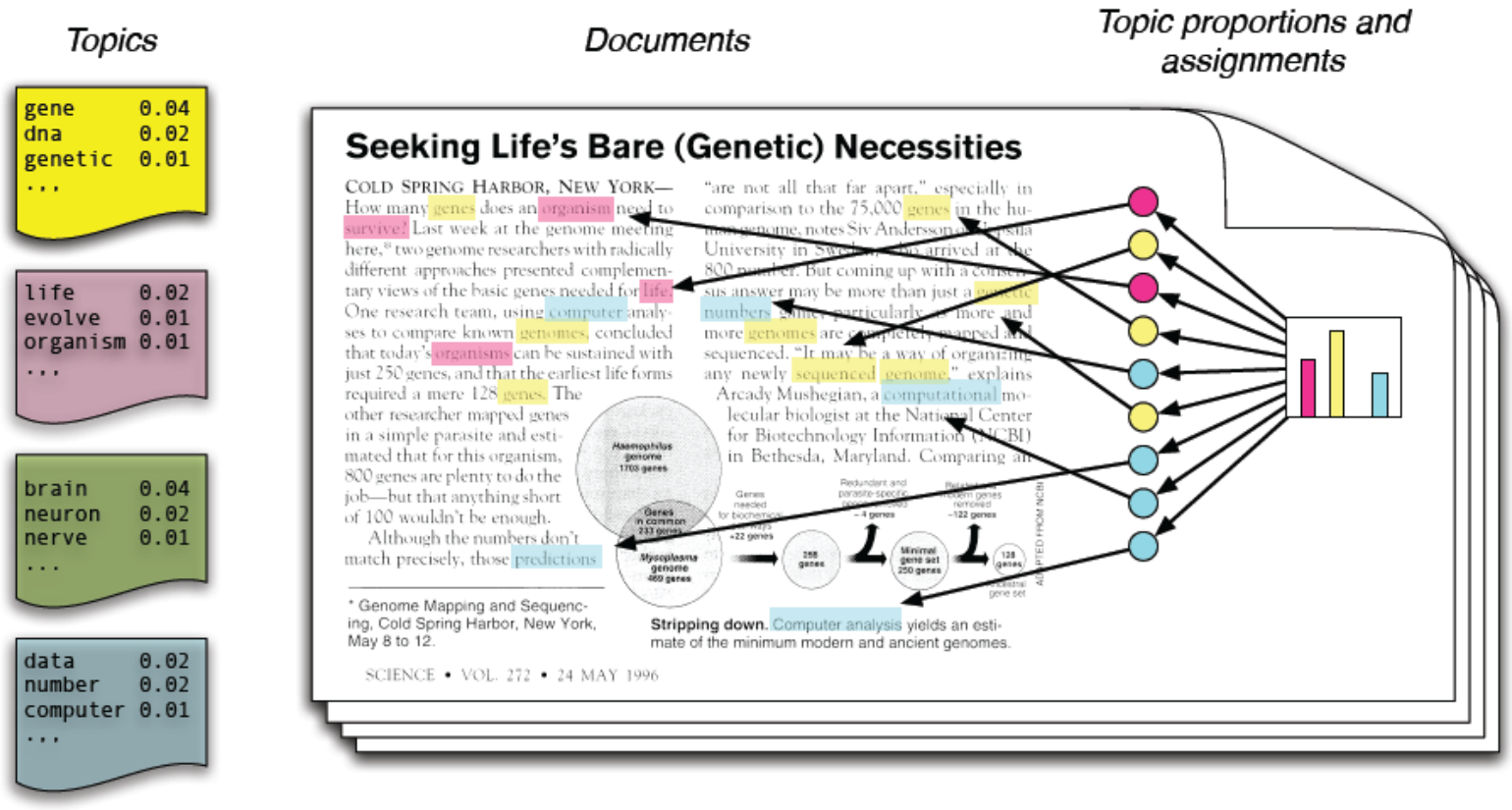
Latent Dirichlet Allocation

Asumsi dalam LDA:

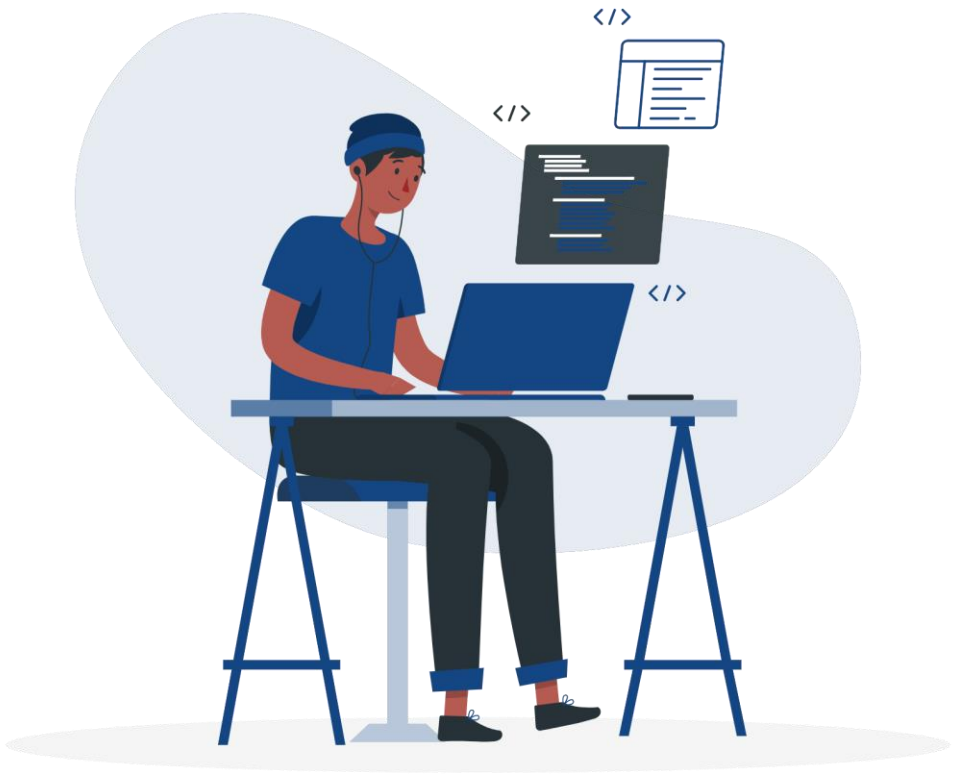
- Setiap dokumen merupakan kumpulan Topik
- Setiap topik merupakan kumpulan kata



Latent Dirichlet Allocation



Sumber: Probabilistic Topic Models By David M. Blei

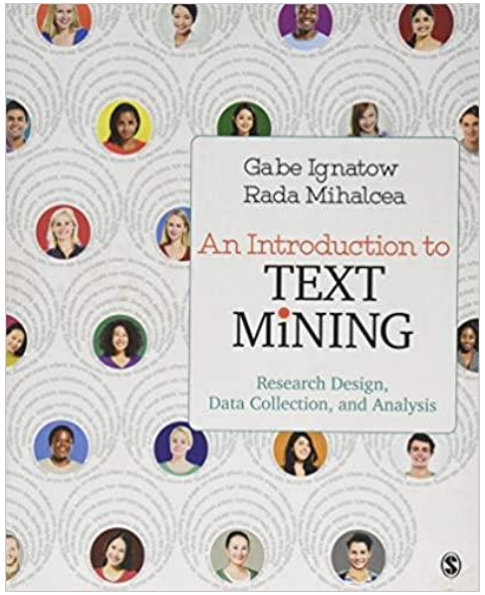


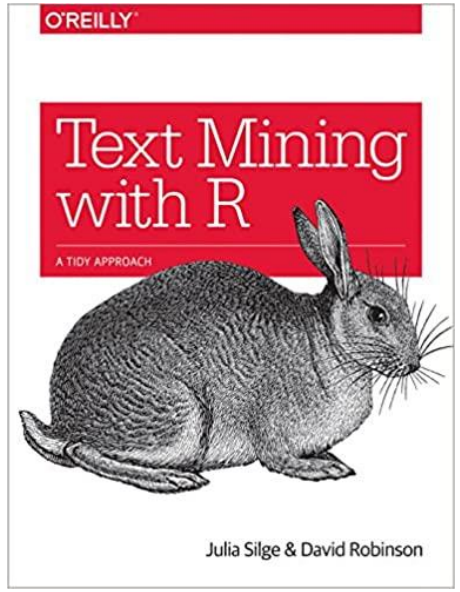
Yuk, Praktek

Biar lebih ngerti

Rekomendasi Buku

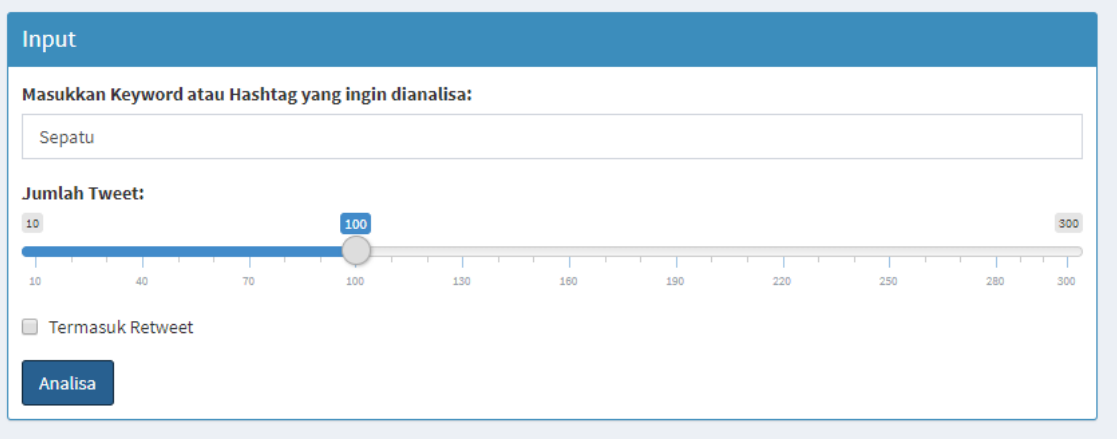
- An Introduction to Text Mining: Research Design, Data Collection, and Analysis 1st Edition
- Text Mining with R: A Tidy Approach 1st Edition

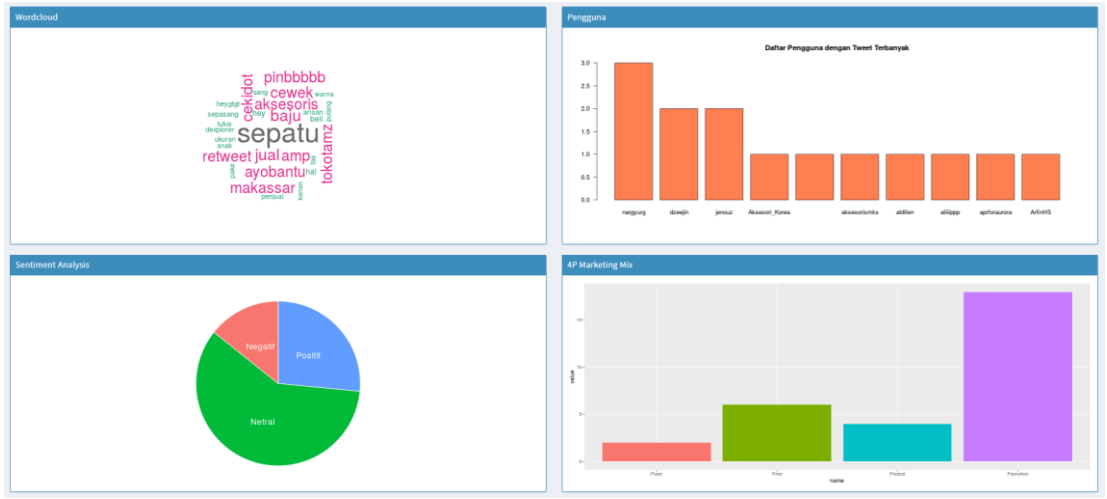




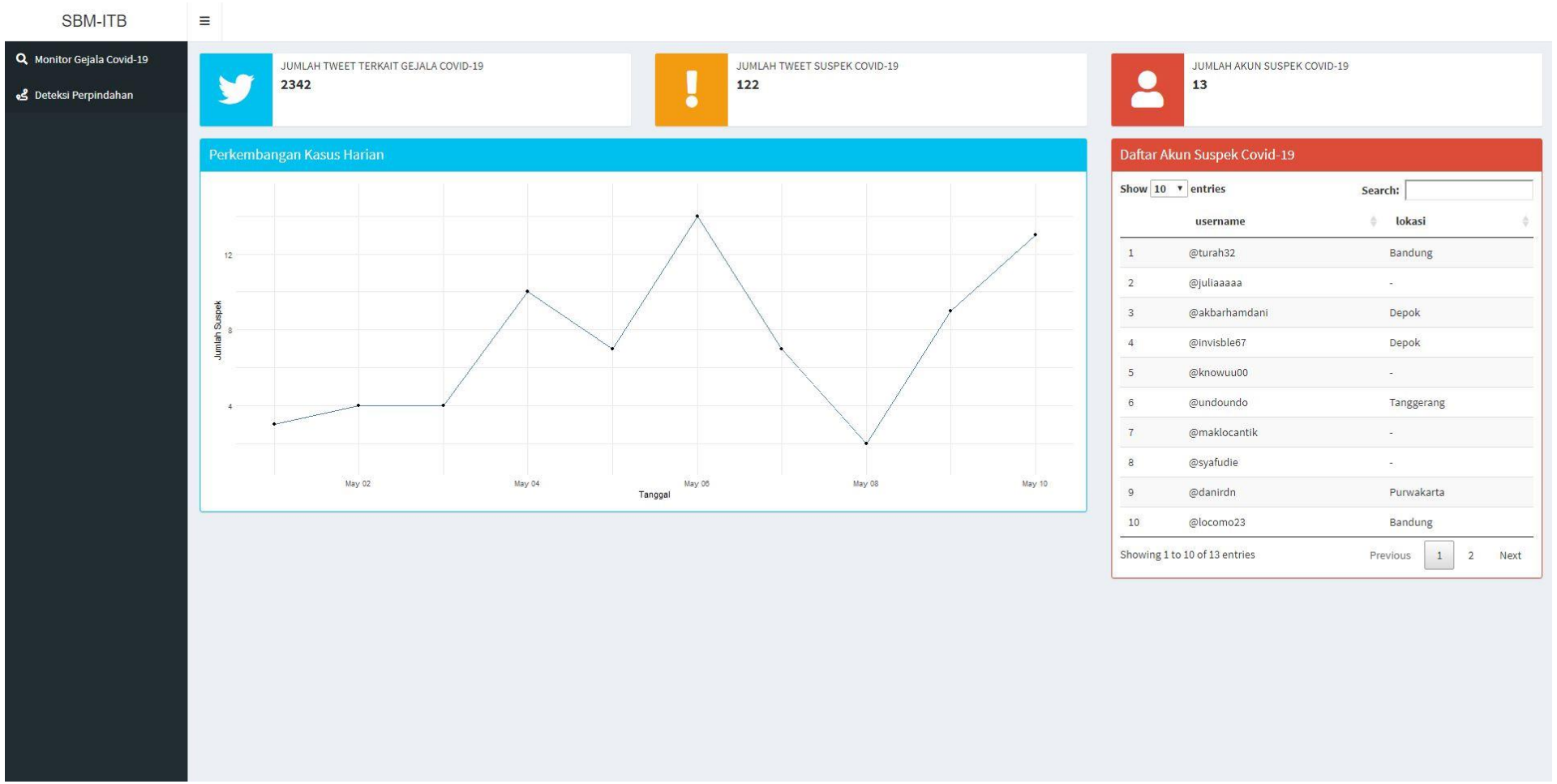
MENGANALISA KONTEN PERCAKAPAN

On Going Project





On Going Project



Sekian, Terima Kasih

Jangan Lupa Bahagia ☺