

A futuristic AI woman with a white and blue body and a complex, glowing blue and red head structure is shown in profile, holding a yellow industrial robotic arm. The background is a dark blue space filled with various data-related icons such as a bar chart, a cloud, a checkmark, a factory, a recycling symbol, and a water drop, all connected by dotted lines. The text "INDUSTRY 4.0" is prominently displayed in the center in a bright cyan font.

INDUSTRY 4.0

PERANAN MATEMATIKA DI ERA INDUSTRI 4.0

Seminar Nasional Matematika PSB XVII
Matematika, Universitas Andalas

ROZA RIA INDAH
Data Scientist
PT. eBdesk Technology
roza.indah.ri@gmail.com





Roza Ria Indah
Data Scientist

Contact Information
+6285363366996
roza.indah.ri@gmail.com

Education Profile

- Mathematics, Andalas University | 2011 - 2015

Professional Experience

- Data Scientist at PT. eBdesk Technology | 2017 – Present
- Assistant Project Coordinator at PT. Morrigan Services | 2017

Aljabar & Statistika

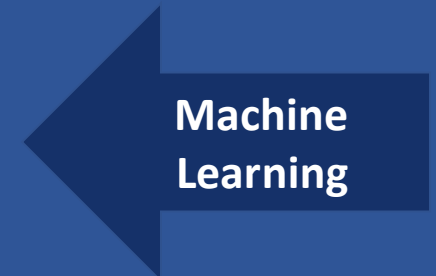
x	y = f(x)	y
1	x^2	1
2		4
3		9
4		16
5		??

X ₁	X ₂	y = f(X ₁ , X ₂)	y
0	0	AND	0
0	1		0
1	0		0
1	1		??



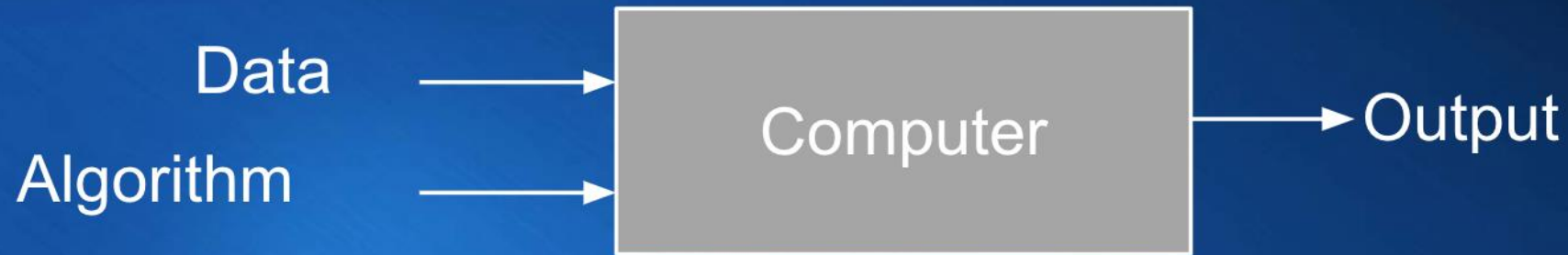
x	y
2	5
3	10
4	17
5	26
6	??

Umur	RKK (0 = tdk merokok 1 = merokok)	TDS (Total Dissolve Solid)	BMI (Body Mass Index)	Asma?
A	B	C	D	E
43	1	126	29	0
41	0	122	32	0
52	0	148	37	1
60	1	162	36	1
50	1	150	33	??

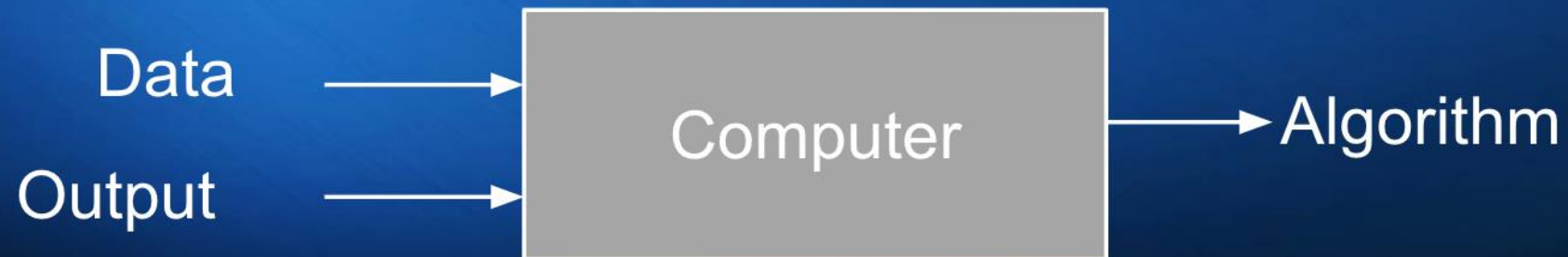


Traditional Programming vs Machine Learning

Traditional Programming



Machine Learning



Penerapan Machine Learning Pada Text

Saya benci padamu → negative

[1 2 0]

Beliau sangat berwibawa → positive

[9 3 5]

Berwisata ke Padang → neutral

[4 8 10]

Indonesia waspada penyebaran virus corona → ??



Predicting Sentiment
Using Machine Learning

BIG DATA



The Five V's of Big Data



Scale of Data

This refers to the sheer volume of data being generated every second.

6 Billion People have cell phones



40 Zettabytes of data will be created by 2020 and increase of 300 times from 2005



Most companies in the U.S. have at least **100 Terabytes** of data stored.



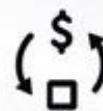
1 in 3 Business leaders don't trust the information they use to make decisions



Uncertainty Of Data

This refers to the discrepancies found in the data.

Poor data quality costs the US economy around **\$ 3.1 Trillion a year**



The New York Stock Exchange capture **1 TB of Trade Information**

Analysis of Streaming Data

Denotes the speed at which data is emanating and changes are occurring between the diverse data sets.



By 2016 it is projected there will be **18.9 Billion** network connections

Modern cars have close to **100 Sensors**



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

Different forms of data

As more and more data is being digitized.



5V of Big Data

Value Of Data

Having access to big data is all well and good but that's only useful if we can turn it into a value.



VARIETY DATA

STRUCTURED DATA

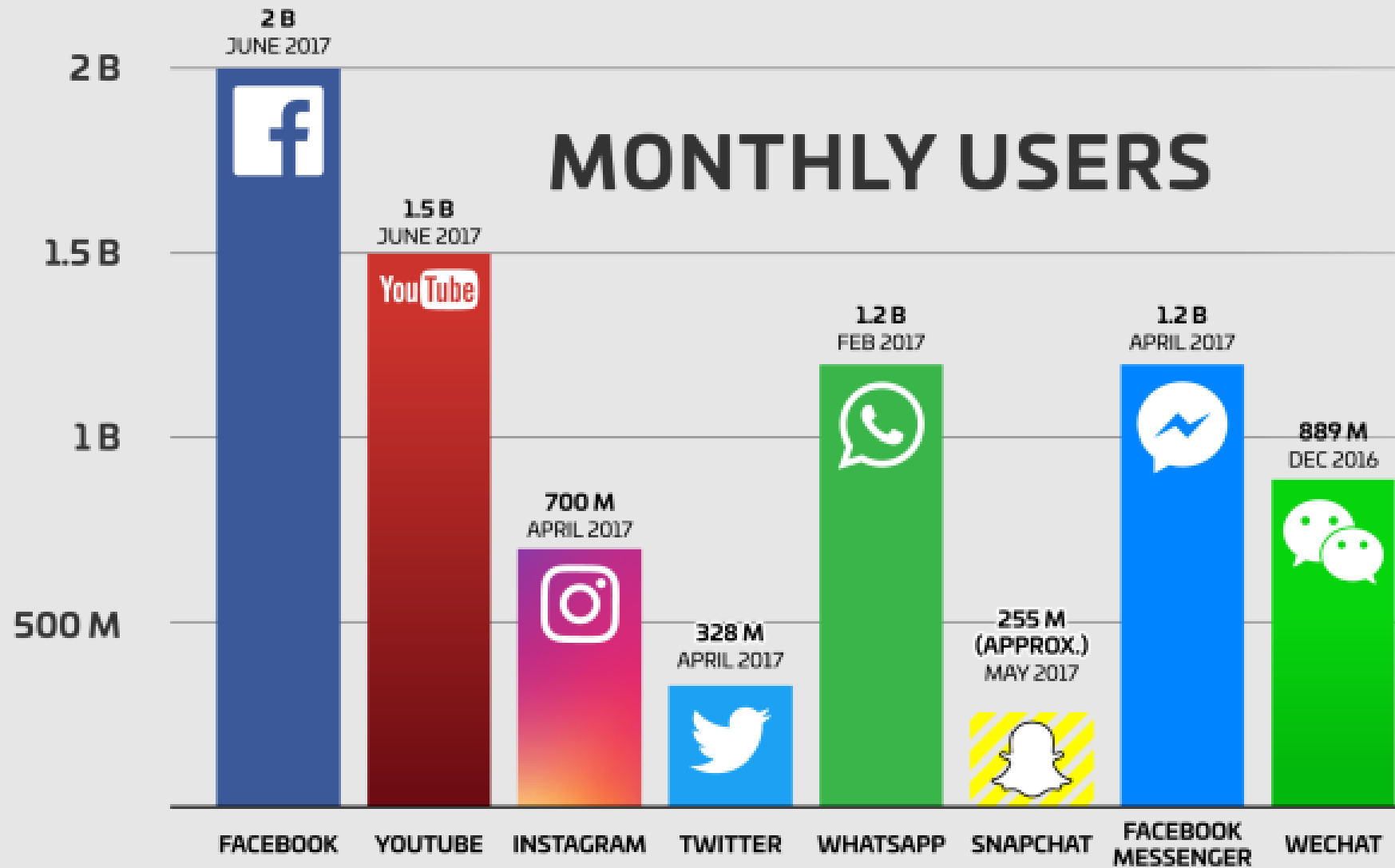


SEMI - STRUCTURED DATA



UNSTRUCTURED DATA





Source : <https://techcrunch.com/2017/06/27/facebook-2-billion-users/>



BIG DATA

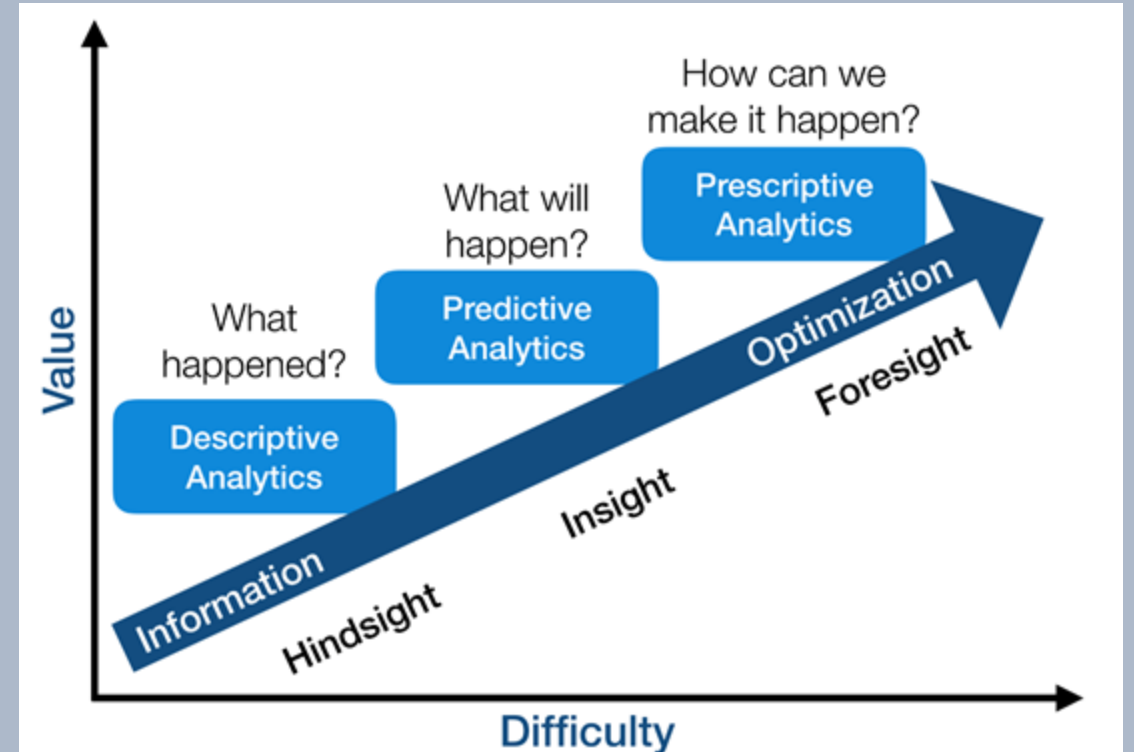
ANALYTICS

ANALYTICS

1 Descriptive Analytics

2 Predictive Analytics

3 Prescriptive Analytics





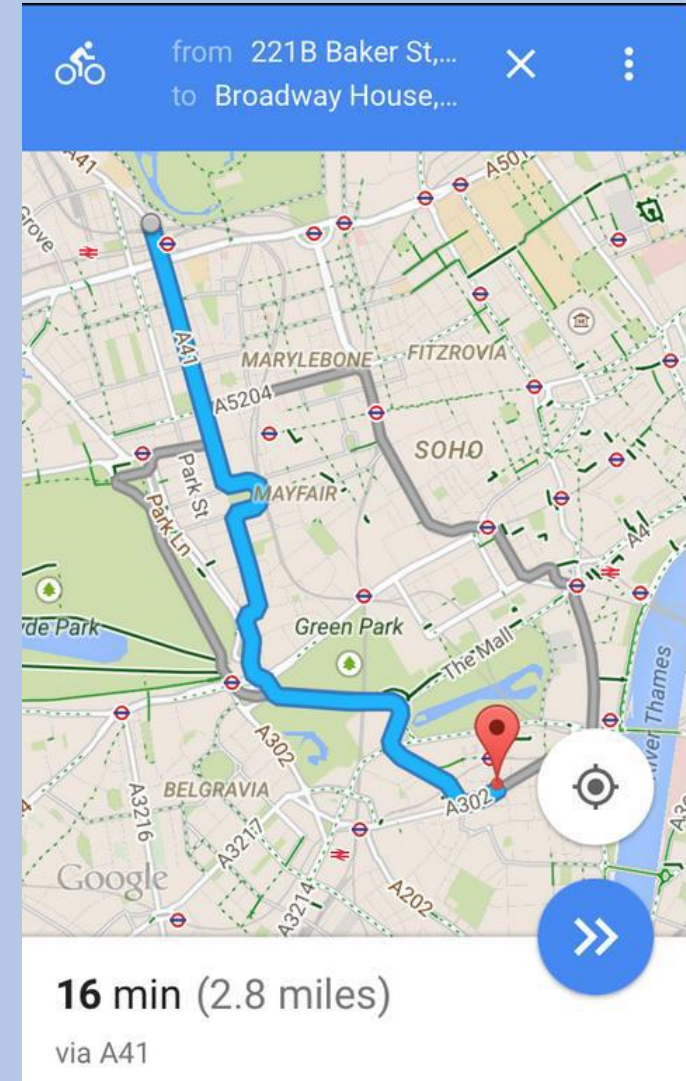
Amazon Wants to Use Predictive Analytics to Offer Anticipatory Shipping

3

Prescriptive Analytics



Self-driving (autopilot) car memutuskan **hal terbaik** yang perlu dilakukan dalam segala kondisi (*safe driving*)



Google Map menyarankan **rute tercepat** untuk sampai tujuan

**You can have data without information,
but you cannot have information
without data.**

- Daniel Keys Moran

**American Computer Programmer and
Science Fiction Writer**





PROCESSING AND INSIGHT OF THE DATA

Analysis Data Text

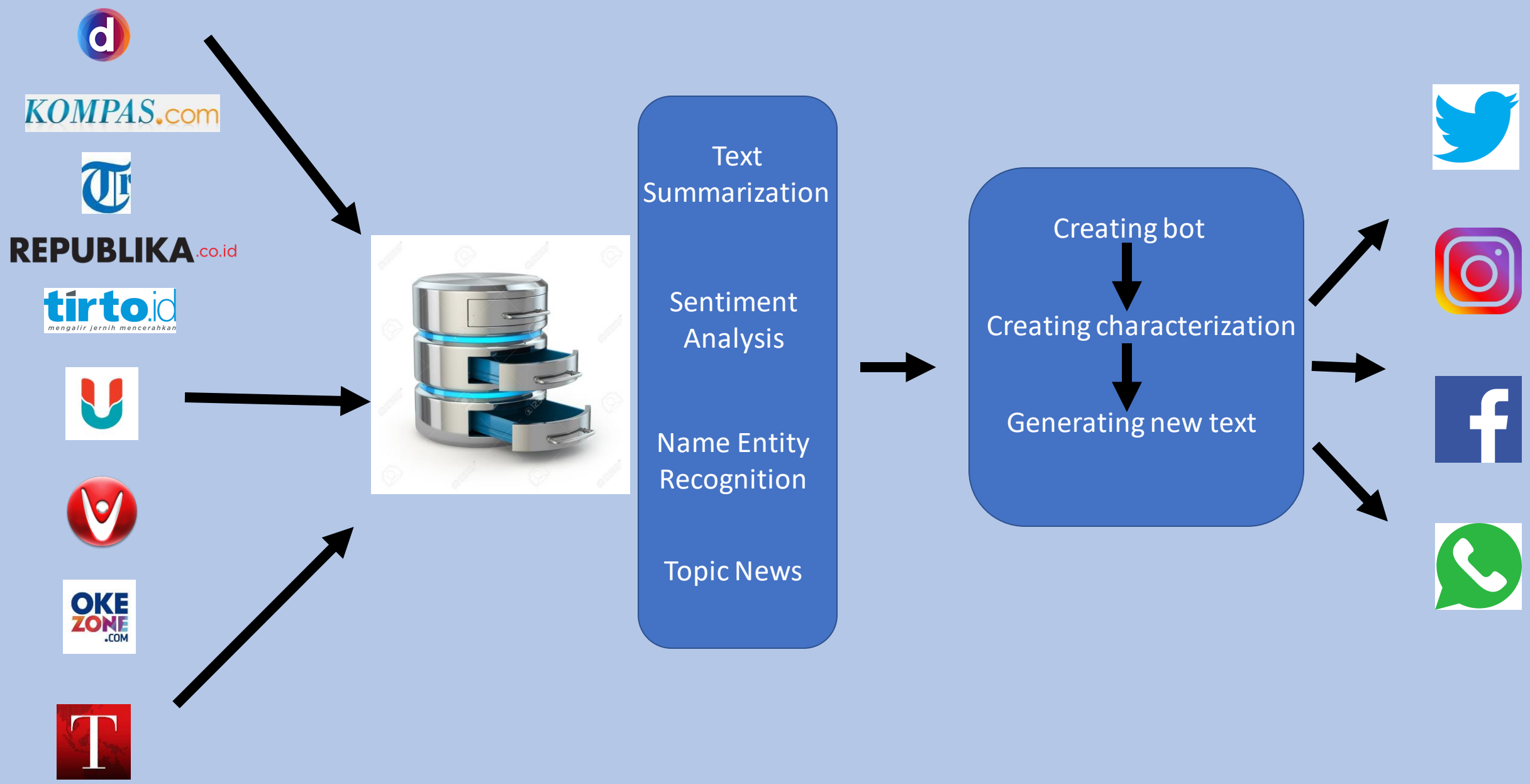
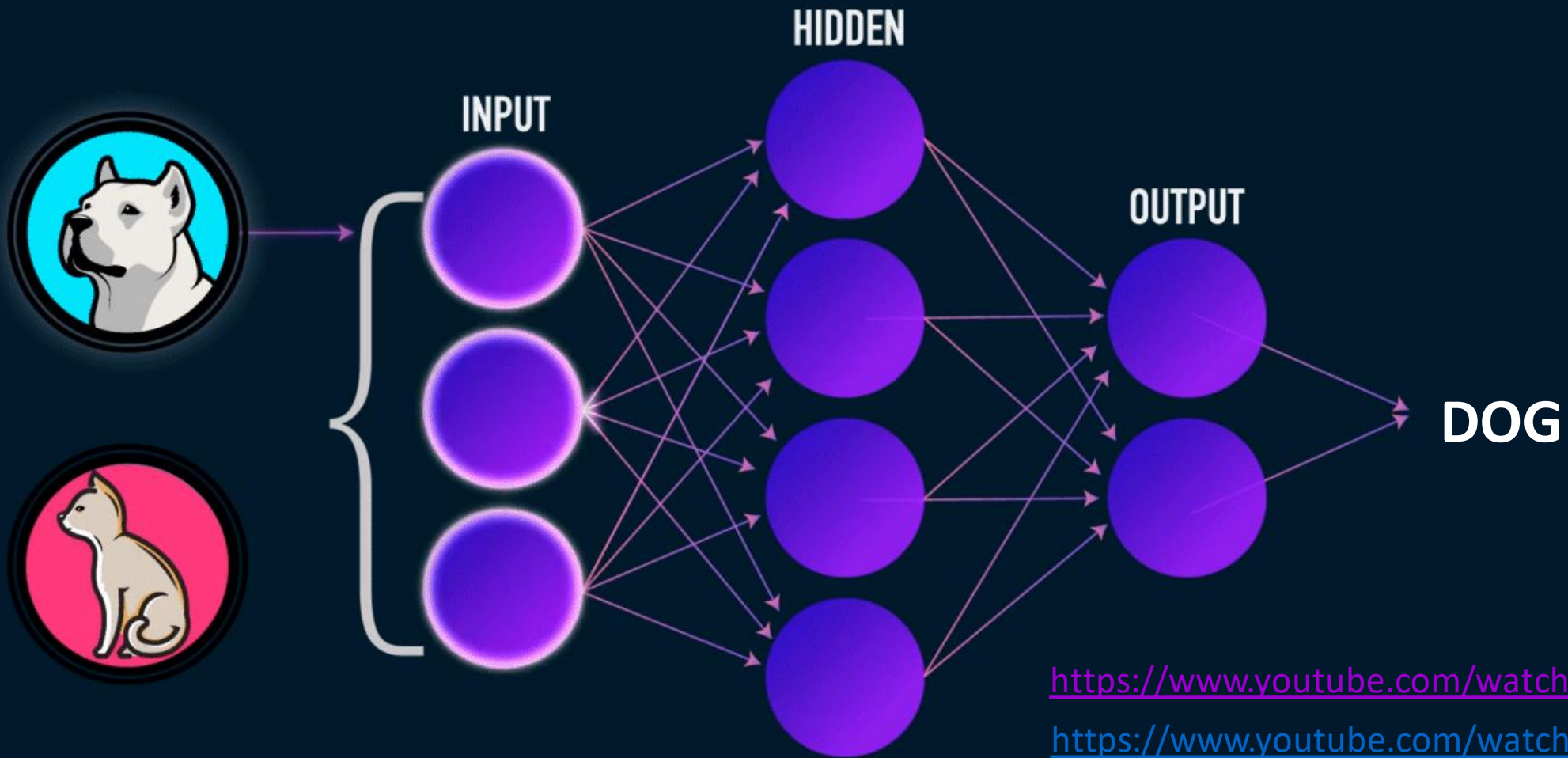


Image Detection



<https://www.youtube.com/watch?v=aircAruvnKk>

<https://www.youtube.com/watch?v=3JQ3hYko51Y>

<https://www.youtube.com/watch?v=LBrmElQinTc>

Face Recognition



[DATA] ———— []



```
1110101010001010101010101110011
000101010001010111001010100011010011
1101001000101010101010111001
1010101011001
```



NO: ONE PERSON

GENDER: MAN

AGE GROUP: YOUNG MAN

ETHNICITY: CAUCASIAN

HUMAN BODY PART: HUMAN FACE

TIME: 167 S

DETECTION: 63621 POINTS

POS (X/Y/Z): 1322 / 856 / 21

Signal Processing



Sophia Robot

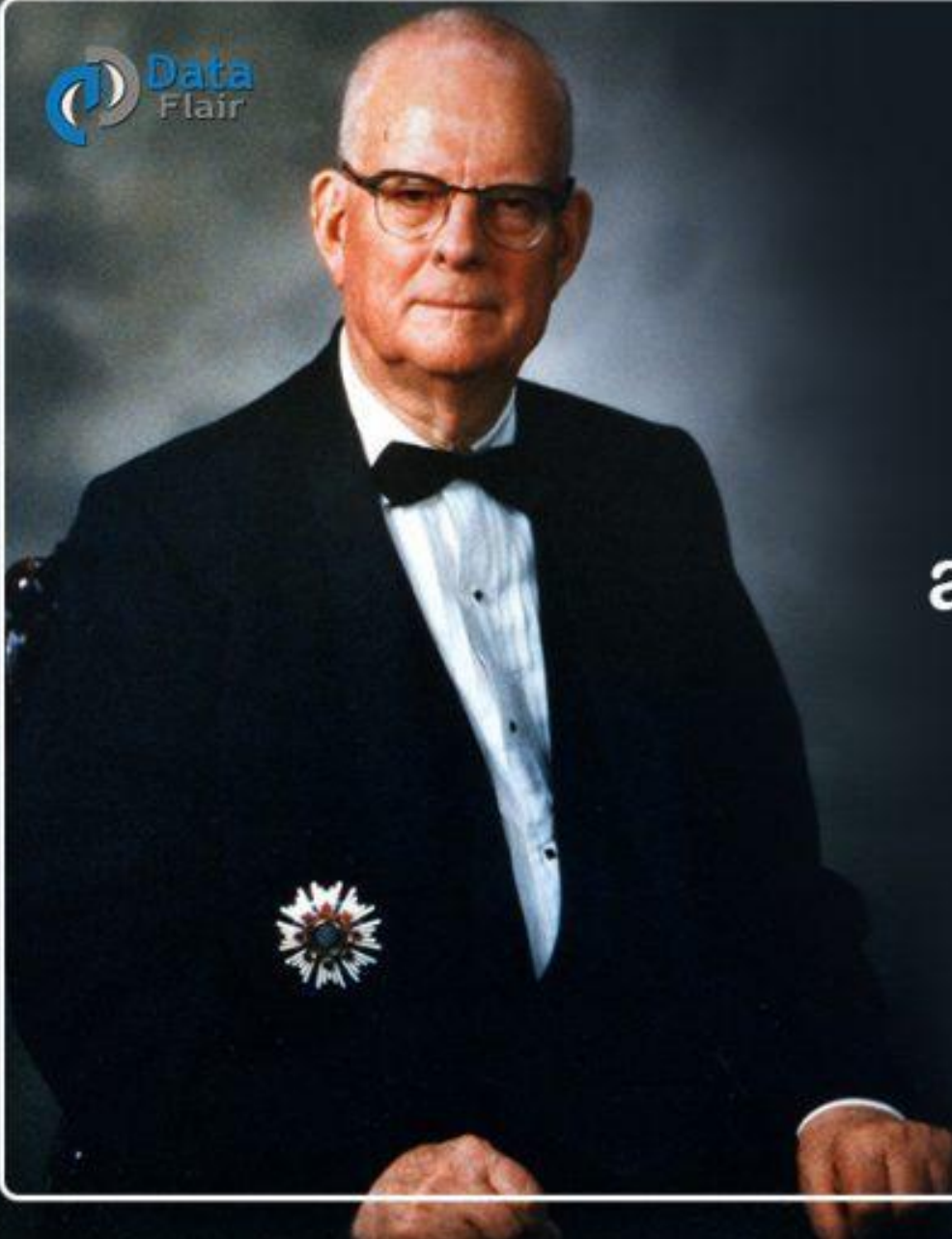


Name : **Sophia**
Who am I? : **Social humanoid robot**
My parent? : **Hong Kong-based company Hanson Robotics (David Hanson)**
Introduced to the world : **2015**

<https://www.youtube.com/watch?v=R0bVxbRCd-U>

BIG DATA APPLICATIONS





**Without data you're just
another person with an opinion.**

- W. Edwards Deming

**Statistician, Professor, Author,
Lecturer, and Consultant**