



# **Analytics Today: Data, Tech, and Regulation**

Hendri Karisma

# HELLO!

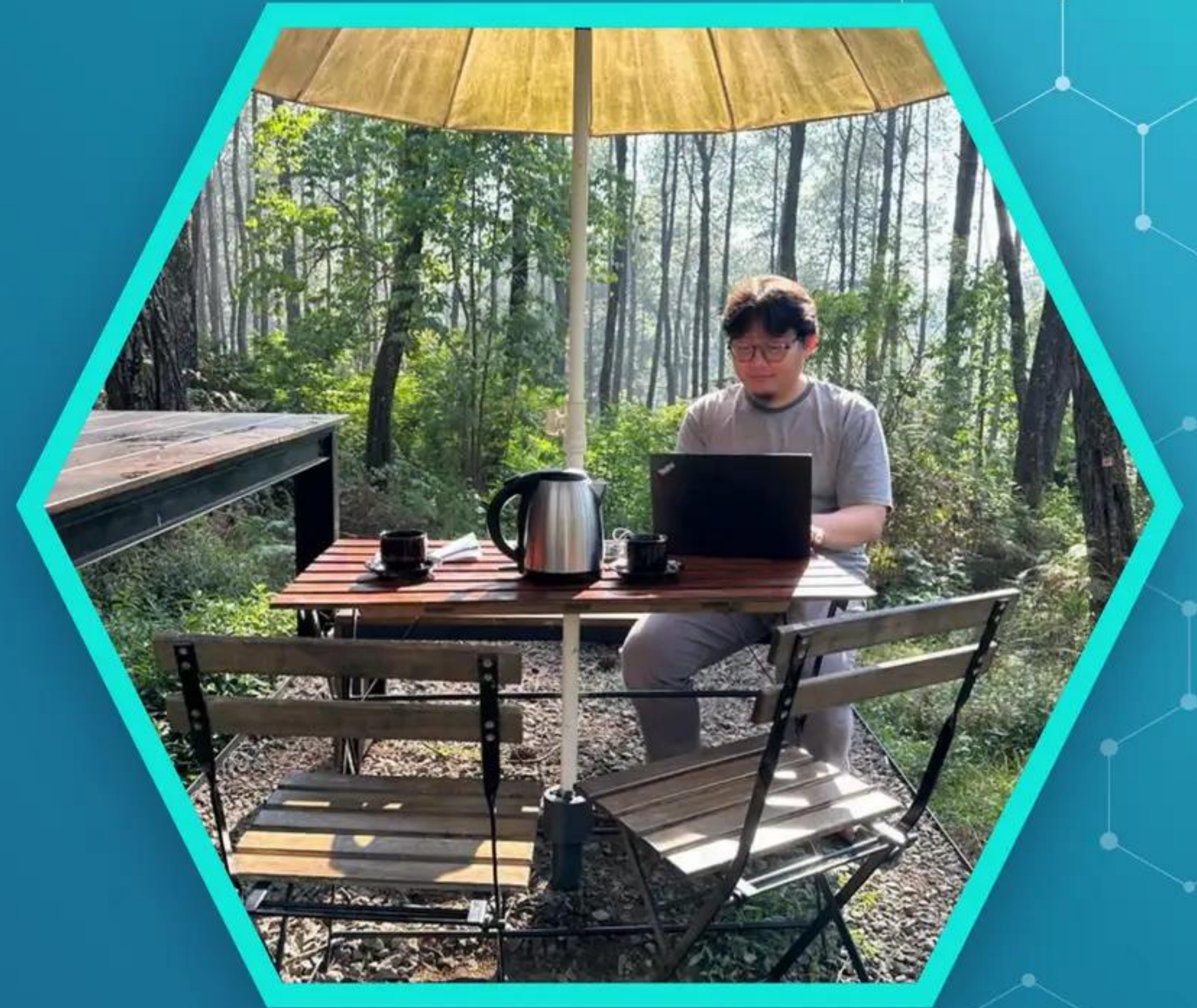
I AM HENDRI KARISMA, M.T.

- ◇ Principal R&D at **PT. Akar Intidata**
- ◇ Data Team Lead
- ◇ Working for Advanced Analytics Platform, Geo Performance, Fraud Detection, and Machine Learning Engine

You can find me at

@infoHendri (X/twitter)

@karism4\_ (instagram)





“Data analytics converts raw data into actionable insights. It includes a range of tools, technologies, and processes used to find trends and solve problems by using data. Data analytics can shape business processes, improve decision-making, and foster business growth.”

# Data Analytics

- ◇ Descriptive Analytics
- ◇ Diagnostics Analytics
- ◇ Predictive Analytics
- ◇ Prescriptive Analytics





# Data Analytics vs AI vs Machine Learning



# Data

Let's start with the Definition



“Data is Fact”



“Data is Fact”

“...Data just like fuel for  
Rocket.. And The Method is  
the Rocket...”

# 3 Important Statistics About How Much Data Is Created Every Day

## 1 How much data is generated every minute?

Source: Domo

**41,666,667**

messages shared by WhatsApp users

**1,388,889**

video / voice calls made by people worldwide

**404,444**

hours of video streamed by Netflix users

**347,222**

stories posted by Instagram users

**150,000**

messages shared by Facebook users

**147,000**

photos shared by Facebook users

## 2 Estimated Data Consumption from 2021 to 2024

Source: IDC / Statista



## 3 Data Growth in 2021

Sources: TechJury, Internet Live Stats, Cisco, PurpleSec

**2 TRILLION**

searches on Google by the end of 2021

**1.134 TRILLION MB**

volume of data created every day

**3,026,626**

emails sent every second, 67% of which are spam

**278,108 PETABYTES**

global IP data per month by the end of 2021

**230,000**

new malware versions created every day

**82%**

share of video in total global internet traffic at the end of 2021

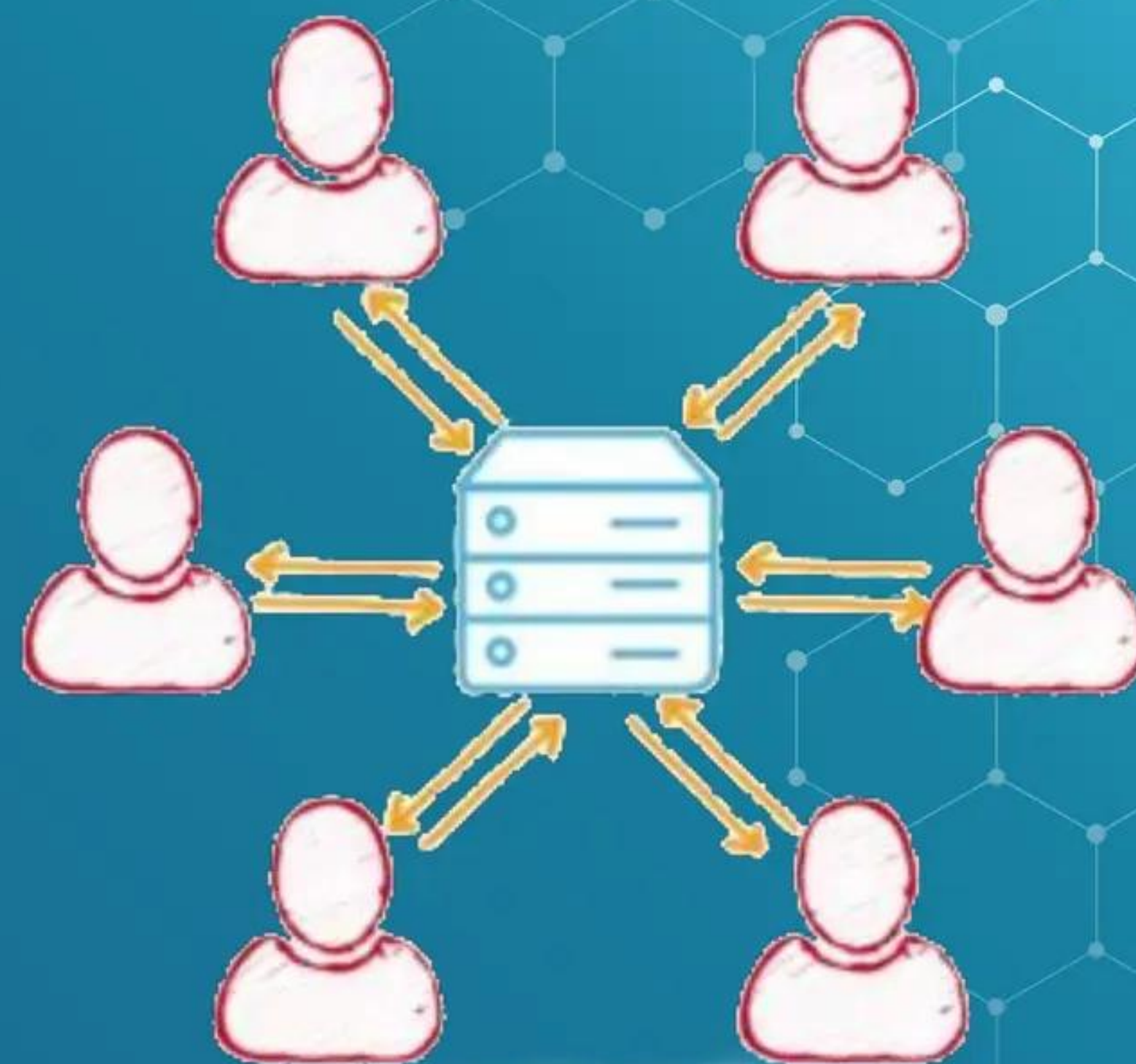
# The Type of data



first-party data



second-party data



third-party data

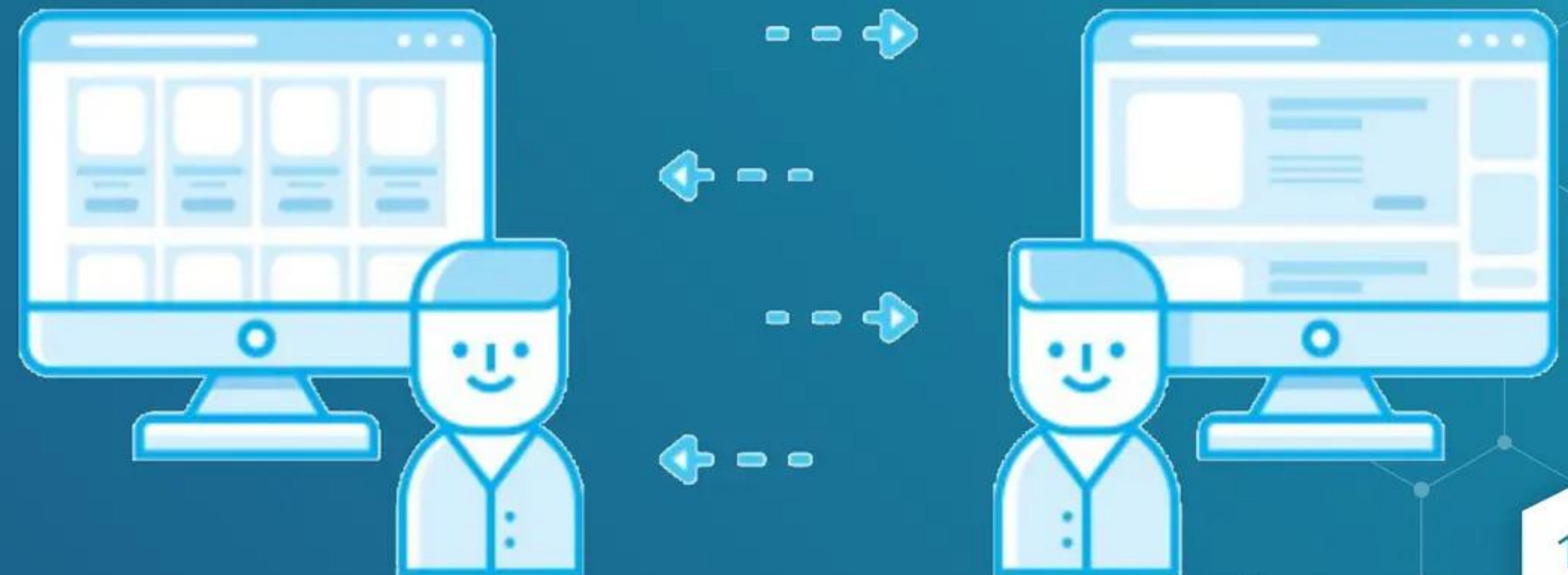
## First Party Data

- ◆ Data collected and owned by a brand
- ◆ “Free”, differentiated and highly relevant
- ◆ Accurate
- ◆ Ex : Transactional, Online Behaviour, CRM, Subscription, Social Data



## Second Party Data

- ◇ From Strategic partner
- ◇ Another Company first party data
- ◇ Not broadly sold and available only to those within the agreement



## Third Party Data

- ◆ Paid online and offline data made available
- ◆ Broadly sold and easily accessible
- ◆ Could be less accurate



## Why 3rd Party is matter?

- ◆ Efficient to enhance our first party data
- ◆ Came from outside our target market or customer
- ◆ Collected by multiple ways, from multiple sources
- ◆ Less reliable from first and second party data





How we get the 3rd party data?

To get more fuel for our rocket

# How we get the 3rd party data?



# Nusa Data

- ◇ Data Marketplace Multi-Industry
- ◇ Connecting between providers with the consumers

The screenshot shows the Nusa Data website homepage. At the top left is the NUSA DATA logo. The navigation menu includes HOME, PRODUCT, RESOURCES, USE CASE, CONTACT US, SIGN IN, and a GET STARTED button. The main heading reads "Indonesia's First Multi-Industry Data Marketplace". Below this is a sub-heading: "Connecting data across many major industries in the private and public sectors through trusted world-class 21st century secure and private environments." A WATCH DEMO button is positioned below the sub-heading. On the right side, there is a "Welcome to Nusa Data" sign-up form with fields for "Your Full Name" and "Email", a SIGN UP button, and a link for "Already have an account? Sign In". At the bottom, a section titled "Our Partnership" features the text "Trusted by" followed by logos for Brankas, telesign, Verihubs, smartfren. BUSINESS, factori, and Braga Technologies.



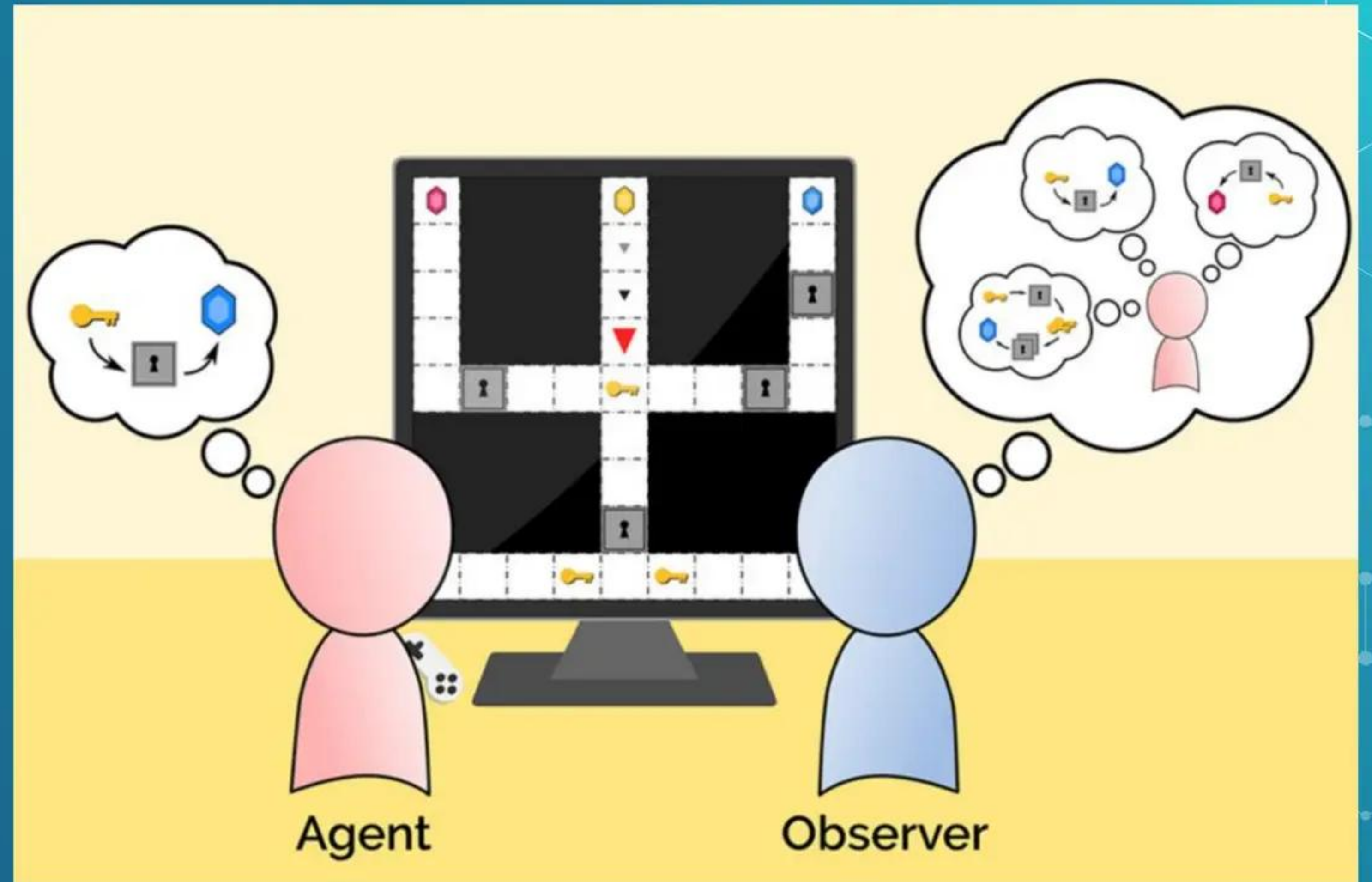
2

# Technologies (methods or tools or apps)

Develop AI to Support The Process and Build The Solutions

Today we have AI,

Just use LLM!





**BARD AI**

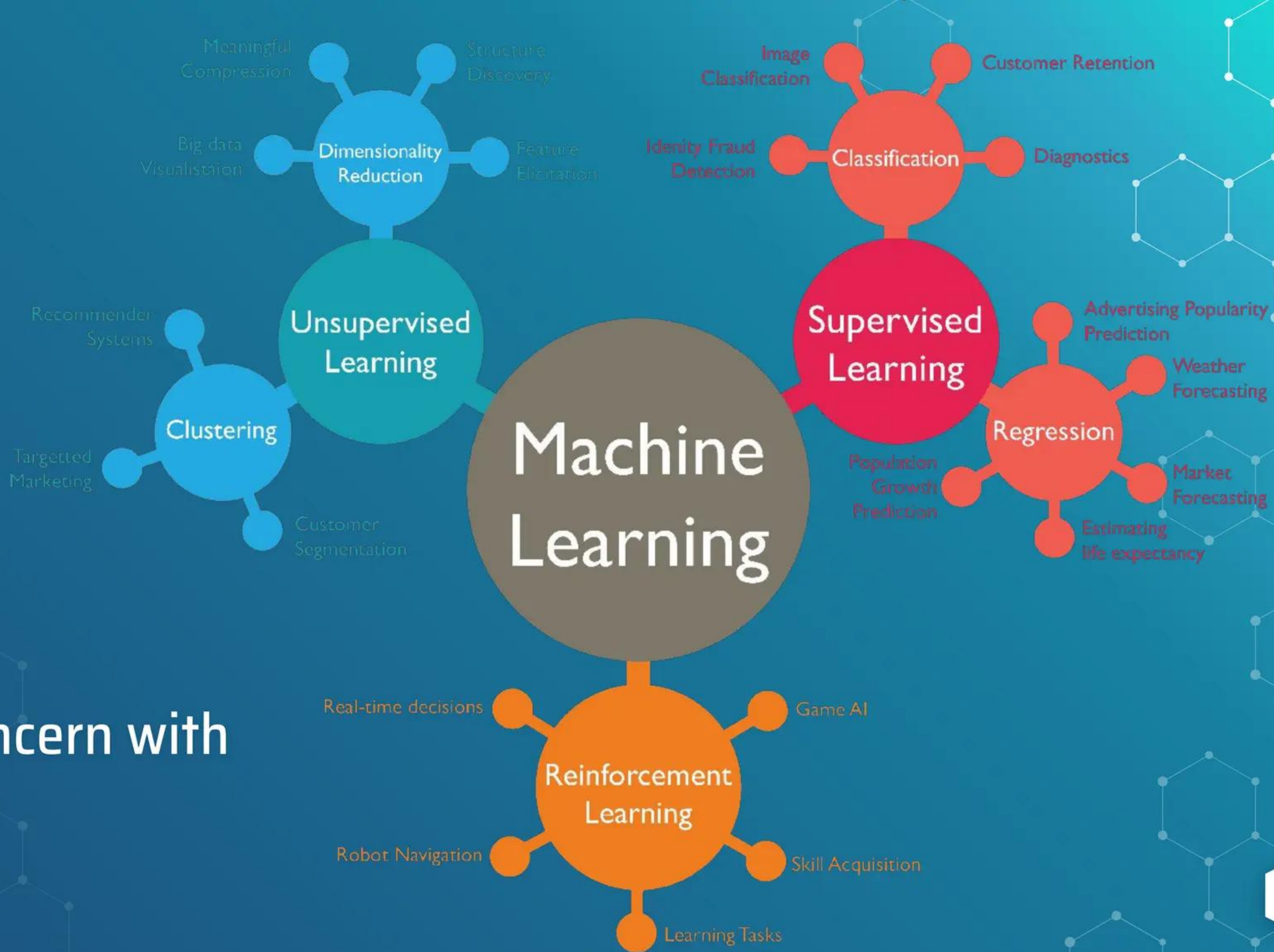
Large Language Model  
Large Visualization Model  
Generative ML  
Deep Learning  
Machine Learning





# Is Industry directly need those kind of Techs?

Is it solve the problems for all industry areas?



They still concern with specific area

# Issues in Industry

- ◇ Data
- ◇ Tech
- ◇ Experts
  - ◆ Data Scientist
  - ◆ AI/ML Engineer
  - ◆ Data Engineer
- ◇ Regulation
- ◇ Cost





# Data Role

## Scientist

The goal of a scientist is to answer questions and discover information about their chosen field of study.

## Engineering

An engineer might produce physical item or blueprint for a new process.

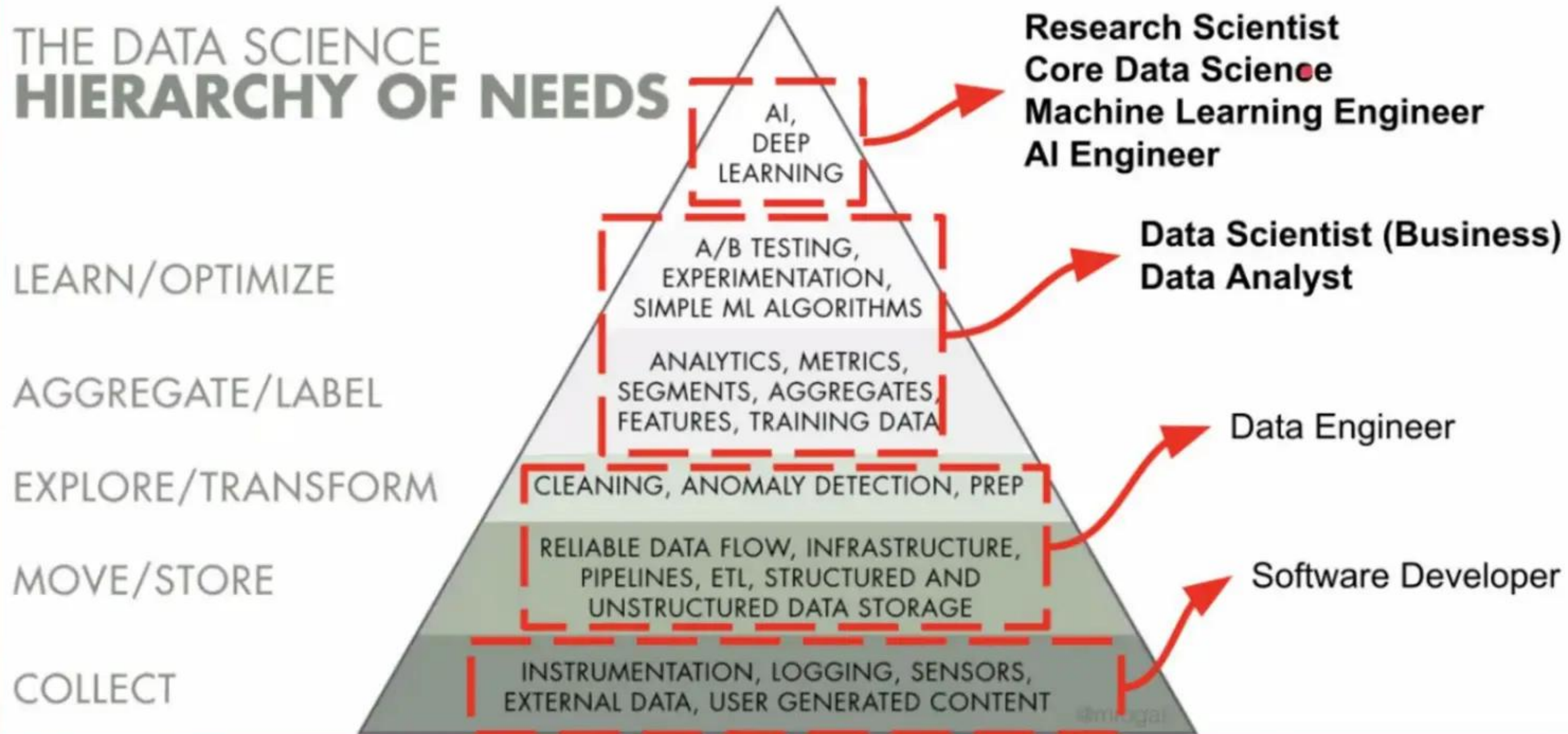
# Data Roles

- ◇ Data Scientist
- ◇ Data Analyst
- ◇ Business Intelligence
- ◇ Data Engineer
- ◇ AI/ML Engineer



# Data Scientist work at Business Focused/Enterprise

## THE DATA SCIENCE HIERARCHY OF NEEDS



# Data Scientist

The term “data scientist” was coined as recently as 2008 when companies realized the need for data professionals who are skilled in organizing and analyzing massive amounts of data.<sup>1</sup> In a 2009 McKinsey&Company article, Hal Varian, Google’s chief economist and UC Berkeley professor of information sciences, business, and economics, predicted the importance of adapting to technology’s influence and reconfiguration of different industries.

# Data Engineer

Data engineers work in a variety of settings to build systems that collect, manage, and convert raw data into usable information for data scientists and business analysts to interpret. Their ultimate goal is to make data accessible so that organizations can use it to evaluate and optimize their performance.

These are some common tasks you might perform when working with data:

- ◆ Acquire datasets that align with business needs
- ◆ Develop algorithms to transform data into useful, actionable information
- ◆ Build, test, and maintain database pipeline architectures
- ◆ Collaborate with management to understand company objectives
- ◆ Create new data validation methods and data analysis tools
- ◆ Ensure compliance with data governance and security policies

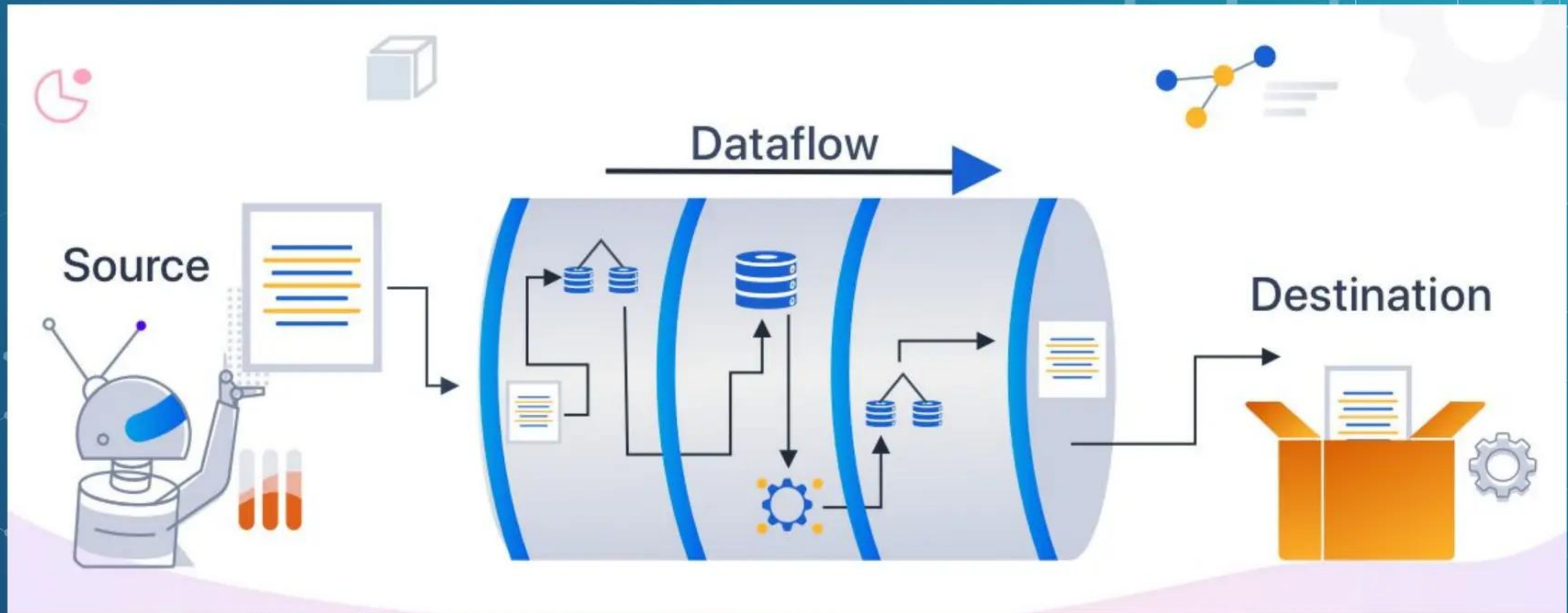
## AI/ML Engineer

Artificial intelligence (AI) engineers are responsible for developing, programming and training the complex networks of algorithms that make up AI so that they can function like a human brain. This role requires combined expertise in software development, programming, data science and data engineering. Though this role is related to data engineering, AI engineers are rarely required to write the code that develops scalable data sharing.

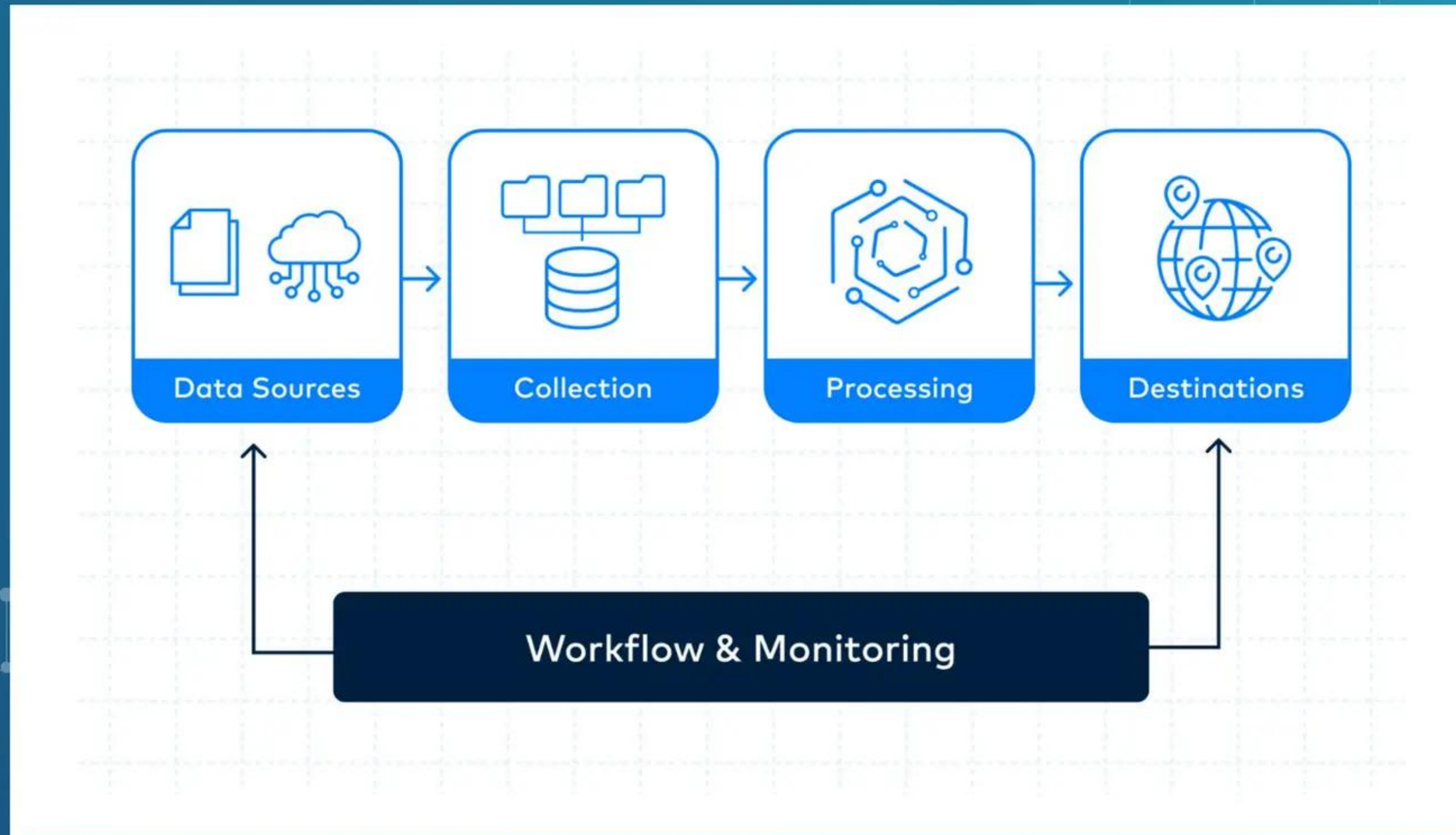
# AI/ML Engineer Skill set

- ◇ Build AI models from the ground up and explain results to product managers and stakeholders
- ◇ Develop, test, and deploy AI models
- ◇ Convert machine learning models into APIs so other applications can utilize it
- ◇ Build data ingestion and data transformation infrastructure
- ◇ Work alongside data and business analysts
- ◇ Execute statistical analysis and tune results to extract better insights
- ◇ Automate infrastructure used by the data science team
- ◇ Create and manage AI development and production infrastructure

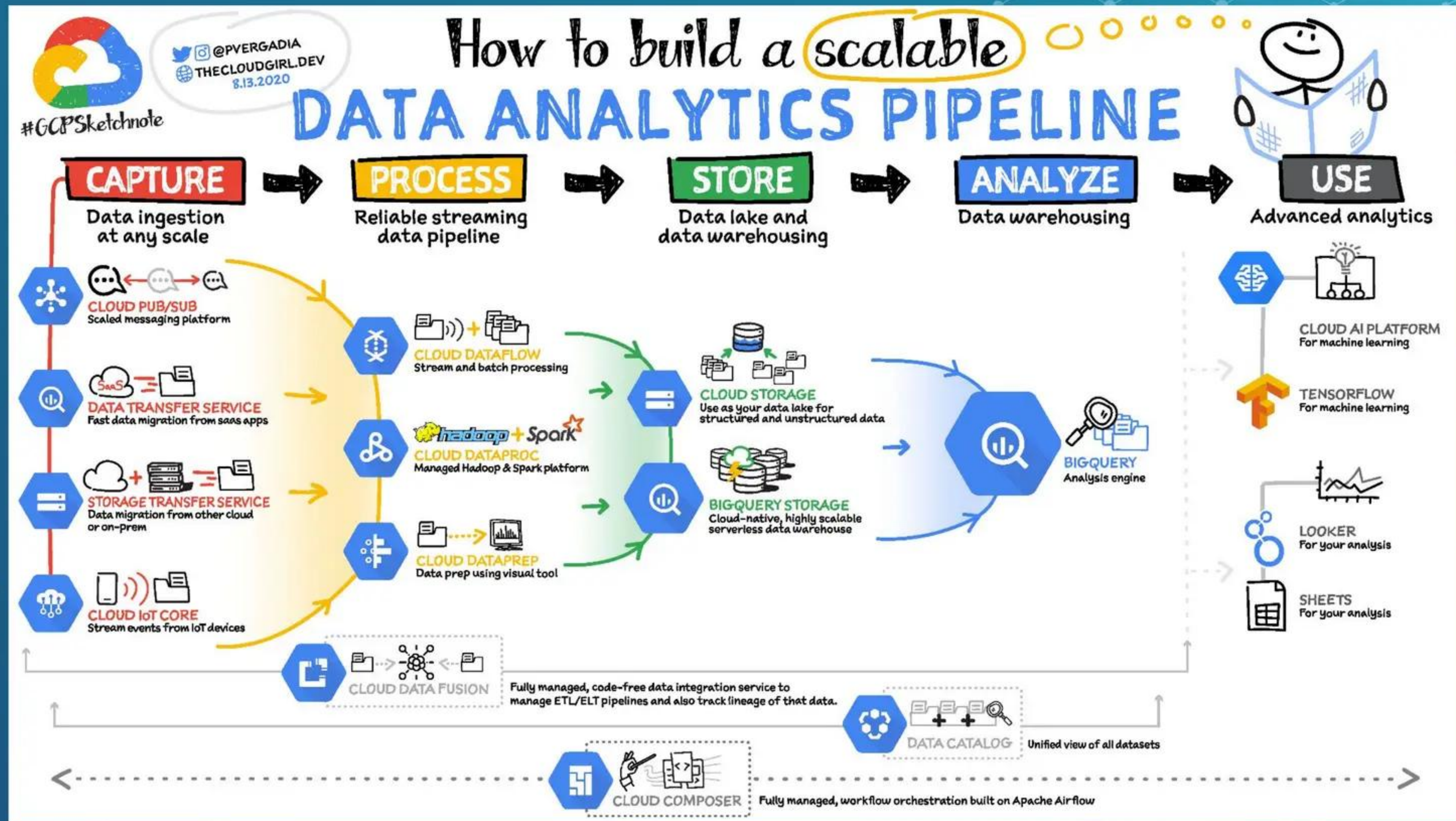
# Tech that need to acquired to build the solution



# Zoom in



# More detail



Alation Amundsen collibra  
**METADATA MANAGEMENT**

accedata MONTE CARLO SODA  
**OBSERVABILITY/QUALITY**

IMMUTA OKERA PRIVAERA  
**SECURITY/GOVERNANCE**

data.world Quilt atlan  
**DATA OPS**

Own{backup} Amazon Cloudwatch DATADOG  
**MAINTENANCE**

jupyter POPSQL MODE  
**COLLABORATION**

TACTON aporia ALGORITHMIA  
**ML OPS**

**DATA MANAGEMENT ACROSS THE PIPELINE**



SAP Jira  
**APPLICATIONS**

hadoop amazon S3  
**DBMS/FILE STORES**

twilio stripe Google Maps  
**3RD PARTY APIS**

SNOWFLOW Segment  
**EVENT COLLECTORS**

SUMO dynamice IBM Watson  
**OTHERS**

Xplenty  
**FULL STACK ETL/ELT**

Stitch Fivetran HEVO  
**CONNECTORS**

amazon REDSHIFT CONFLUENT  
**EVENT STREAMING**

dbt MATILLION lockML  
**MODELLING**

Spark Streaming Flink  
**STREAM PROCESSING**

DAGSTER Airflow  
**WORKFLOW ORCHESTRATION**

DELTA LAKE dremio upsolver  
**DATA LAKES**

amazon REDSHIFT snowflake Google BigQuery  
**DATA WAREHOUSES**

amazon S3 Microsoft Azure Blob Storage  
**FILE/OBJECT STORES**

cloudera IMPALA presto  
**SQL-ON-HADOOP**

ClickHouse druid  
**LOW LATENCY**

alteryx Power BI  
**PREPARATION**

tableau

tableau Power BI Looker  
**BI TOOLS**

anodot outlier  
**METRICS MONITORING**

Streamlit Retool a\_  
**CUSTOM APPS**

cube.js SISENSE  
**EMBEDDED ANALYTICS**

alteryx sas python  
**DATA SCIENCE PLATFORMS**

H2O.ai DataRobot  
**AUTO ML PLATFORMS**

# Engineering skill that need to be required

- ◇ SOLID, Design Pattern, Clean Architecture, etc
- ◇ Software Engineering
- ◇ Tech Tools Characteristics, Behaviour
- ◇ Basic statistics, probilistics and random variable, basic machine learning.
- ◇ High performance computing
- ◇ Security and Regulation
- ◇ ML Ops

# Why Engineering Important?

## Sample Case:

- ◇ We need to run ML service
  - ◆ Sometimes for specific cases
  - ◆ The classification process is about 500ms
- ◇ We run the process (preprocess to main analytics process) as a batch process or need to process data with Large Volume
- ◇ **The model is lightweight**

# Build the Engine

- ◇ We often use pickle or serializable file as model output
- ◇ The size bigger than it should be
- ◇ Impacted to the memory or the space complexity

```
total 44K
-rw-rw-r-- 1 hendri hendri 7,7K 0kt 22 08:24 model_irish_json.json
-rw-rw-r-- 1 hendri hendri 25K 0kt 22 08:41 model_irish_pk.model
-rw-rw-r-- 1 hendri hendri 778 0kt 22 08:41 sample_irish.py
drwxrwxr-x 5 hendri hendri 4,0K 0kt 22 08:27 venv
-rw-rw-r-- 1 hendri hendri 7,7K 0kt 22 08:27 venv/pytho
```



# Sample Model using Good Engineering

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# 3

## Regulation

Need to Comply with all standard especially security

# GRC



# Compliances

- ◇ GDPR (Europe)
- ◇ ISO 27001 (Information Security)
- ◇ UU PDP
- ◇ PCI DSS (Payment)
- ◇ PA DSS (Payment)
- ◇ HIPAA (Healthcare)



# What we need to protect?

## PII

Personally identifiable information (PII) is any information connected to a specific individual that can be used to uncover that individual's identity, such as their social security number, full name, or email address

## Consent

Consent means giving people genuine choice and control over how you use their data. If the individual has no real choice, consent is not freely given and it will be invalid. This means people must be able to refuse consent without detriment, and must be able to withdraw consent easily at any time.

## Credentials

Credentials are a set of login or authentication data that verify a user's identity and grant them access to a particular system or service.

# We need to know how handle the data and our limitation

## Principles

Chapter 3 (Art. 12 – 23)

### Rights of the data subject

Art. 12 – Transparent information, communication and modalities for the exercise of the rights of the data subject

Art. 13 – Information to be provided where personal data are collected from the data subject

Art. 14 – Information to be provided where personal data have not been obtained from the data subject

Art. 15 – Right of access by the data subject

Art. 16 – Right to rectification

Art. 17 – Right to erasure ('right to be forgotten')

Art. 18 – Right to restriction of processing

Art. 19 – Notification obligation regarding rectification or erasure of personal data or restriction of processing

Art. 20 – Right to data portability

Art. 21 – Right to object

Art. 22 – Automated individual decision-making, including profiling

Art. 23 – Restrictions

Chapter 4 (Art. 24 – 43)

### Controller and processor

Chapter 5 (Art. 44 – 50)

### Transfers of personal data to third countries

## B. DESCRIPTION OF TRANSFER

### Categories of personal data processed

Identification data	
Personal identification data	Title, name, first name, private address, phone numbers, email addresses (personal or professional at your choice).
Financial data	
Financial identification data	Bank account numbers, expenses and supporting documents.
Personal characteristics	
Personal details	Age, gender, year and place of birth, citizenship.
Training and studies data	
Academic background and professional qualification	Degree level, PhD thema, year of start of PhD thesis, date of award of PhD, participation in COST trainings.
Professional data	
Professional identification data	Position, institution of affiliation (name and address), place of work, scientific field of expertise, research area.
Career	Participation and role in COST Actions, your grants (dates, funding agency(ies)), CV, ORCID id, professional webpage if any

# Fintech Regulation - Payment

## Who Does PA DSS and PCI DSS Apply To?



### PA DSS

Vendors that develop and sell payment applications



### PCI DSS

Merchants and service providers that store, process, or transmit cardholder data

Your Level is:	Your business does:	You should:
✓ 4	<ul style="list-style-type: none"> <li>- less than 20,000 eCommerce transactions per year</li> <li>- less than 1 million other transactions per year</li> </ul>	<ul style="list-style-type: none"> <li>- complete an annual risk assessment using an SAQ</li> <li>- conduct quarterly PCI scans</li> </ul>
✓ 3	<ul style="list-style-type: none"> <li>- 20,000 - 1 million transactions per year</li> </ul>	<ul style="list-style-type: none"> <li>- complete an annual risk assessment using an SAQ</li> <li>- conduct quarterly PCI scans</li> </ul>
✓ 2	<ul style="list-style-type: none"> <li>- 1-6 million transactions per year</li> </ul>	<ul style="list-style-type: none"> <li>- complete an annual risk assessment using an SAQ</li> <li>- conduct quarterly PCI scans</li> </ul>
✓ 1	<ul style="list-style-type: none"> <li>- 6 million+ transactions per year</li> </ul>	<ul style="list-style-type: none"> <li>- conduct an annual internal audit</li> <li>- conduct quarterly PCI scans</li> </ul>

# Our Standards (Indonesia)

UU PDP

Index KAMI

## Pasal 3

- (1) Data Pribadi terdiri atas:
  - a. Data Pribadi yang bersifat umum; dan
  - b. Data Pribadi yang bersifat spesifik.
- (2) Data Pribadi yang bersifat umum sebagaimana dimaksud pada ayat (1) huruf a meliputi:
  - a. nama lengkap;
  - b. jenis kelamin;
  - c. kewarganegaraan;
  - d. agama; dan/atau
  - e. Data Pribadi yang dikombinasikan untuk mengidentifikasi seseorang.
- (3) Data Pribadi yang bersifat spesifik sebagaimana dimaksud pada ayat (1) huruf b meliputi:
  - a. data dan informasi kesehatan;

## Indeks KAMI (Keamanan Informasi)

Responden:  
Satuan Kerja  
Direktorat  
Departemen

Alamat 1  
Alamat 2  
Kota Kode Pos

(Kode Area) Nomor Telpn  
user@departemen\_responden.go.id  
HH/BB/TTTT

Skor Kategori SE : 37 Kategori SE Strategis

Hasil Evaluasi Akhir:

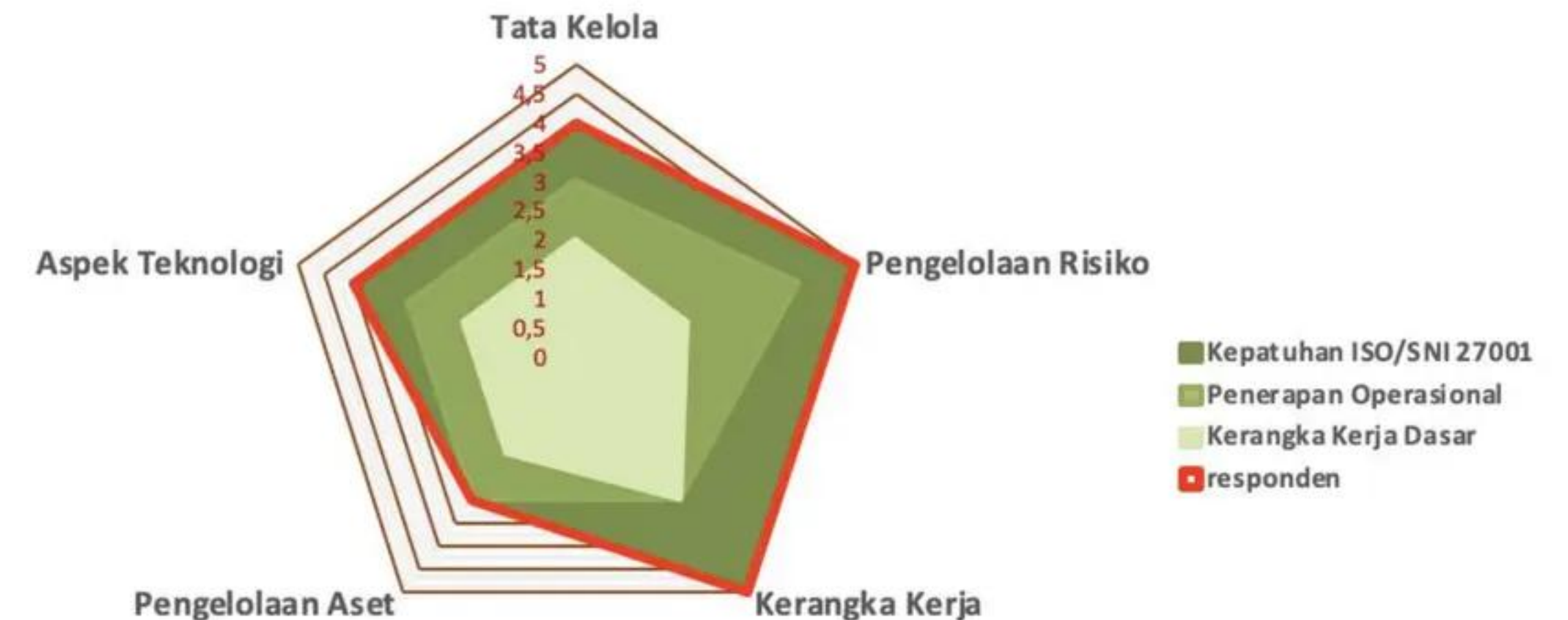
Baik

Tingkat Kelengkapan Penerapan

Standar ISO27001 sesuai Katego

645

Tata Kelola	: 126	Tk Kematangan: IV	III s/d V
Pengelolaan Risiko	: 72	Tk Kematangan: V	
Kerangka Kerja Keamanan Informasi	: 159	Tk Kematangan: V	
Pengelolaan Aset	: 168	Tk Kematangan: III	
Teknologi dan Keamanan Informasi	: 120	Tk Kematangan: IV	
Pengamanan Keterlibatan Pihak Ketiga	: 96%		
Pengamanan Layanan Infrastruktur Aw	: 100%		
Perlindungan Data Pribadi	: 100%		



## Conclusion

To build data or AI solution or engine or system or product is not just need the knowledge of the science of data or AI, even more than just engineering. Science will help us to understand the nature, the cases, engineering will help us to build the best tech solution, and regulation will keep it controlled that will make the system safe, secure, trusted, and reliable.

# THANKS!

ANY QUESTIONS?

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- ◇ [hendri.karisma@akarintidata.ai](mailto:hendri.karisma@akarintidata.ai)
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