

CADT

**IDT**

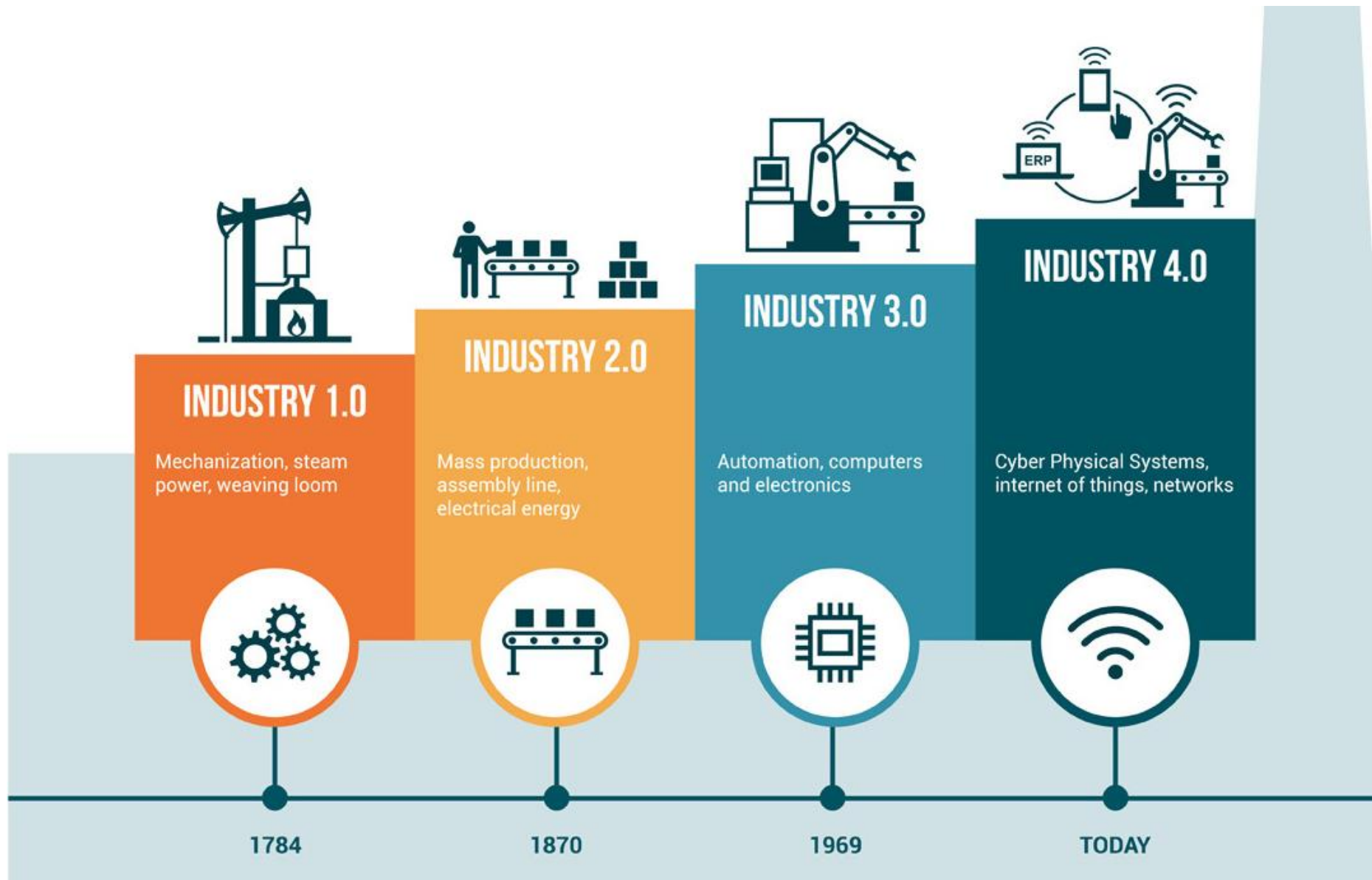
វិទ្យាស្ថានបច្ចេកវិទ្យាឌីជីថល

Institute of Digital Technology

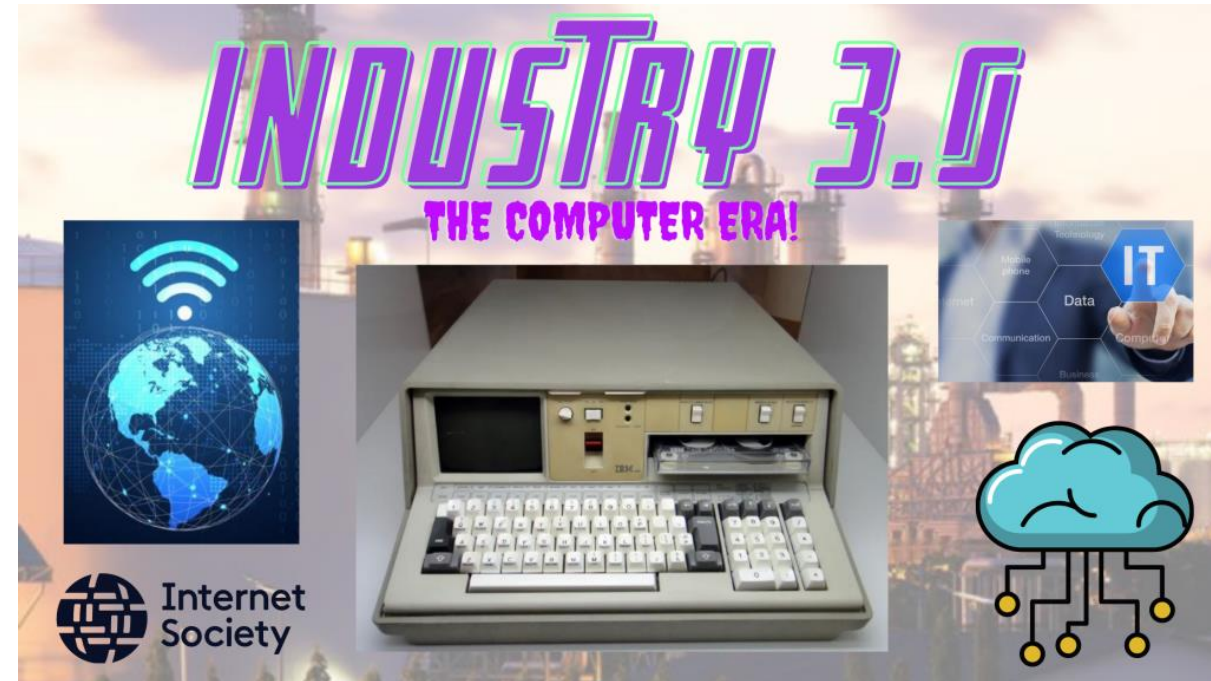
# Data Science in Industry 4.0

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30-August-2023  
@CADT

1. Introduction to Industry 4.0
2. Data Science in Industry 4.0
3. Data Science life cycle
4. Challenges in Industry 4.0
5. Human resource development at IDT



- IT and computer technology are used to automate processes in Industries
- Coming of Internet and WWW
- Starting of digital era



**Note:** the process is automated based on human input





**Digital Revolutions**

## Enhancing automation and connectivity

Machine to Machine (M2M) Communication

Industrial Internet of Things (IIoT)

Improved Communication

Self-Monitoring

Smart Machines

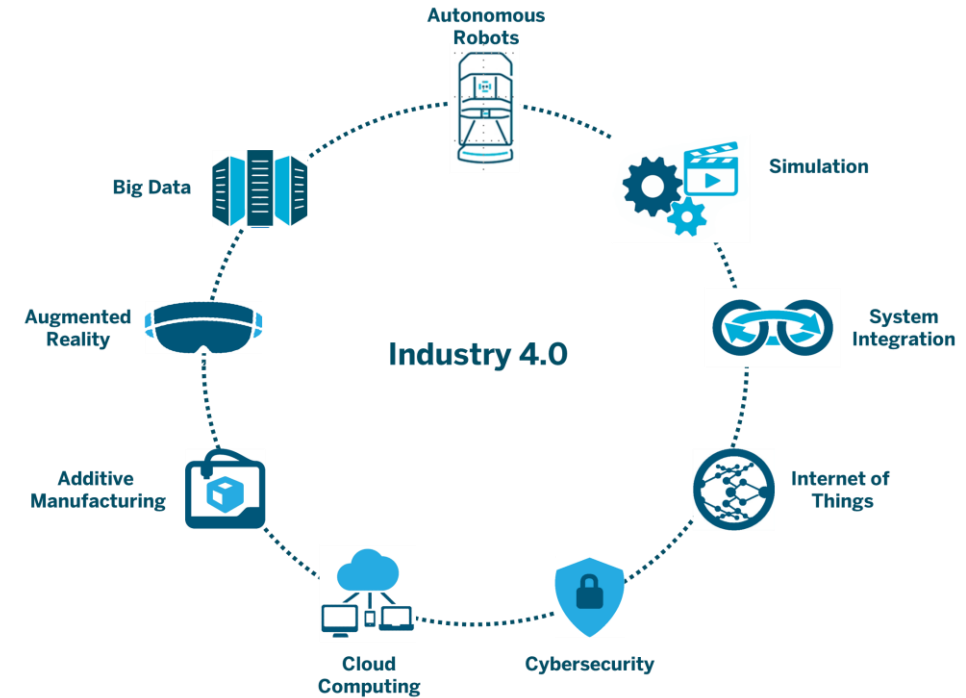


Figure 2



*An automated vehicle would stop if it happens across an obstacle, as it adheres to pre-programmed instructions while an autonomous vehicle would adapt and try a different way to reach the final destination, Point B in this illustration.*





All things are smart and connected to the internet

Generating and analyzing the data in real time



The use of autonomous robots:

- To reduce labor costs
- To increase production
- To make industries more competitive





**Machine Learning And AI Is Everywhere.**





កម្មវិធីបកប្រែសំឡេងពហុភាសា

ទាញយក ដោយឥតគិតថ្លៃ

## VoiceTra

**បកប្រែសំឡេង ទៅជាភាសាផ្សេងៗ! រួមមាន ៣១ ភាសា!**

តើមានទំហំផ្សេងសម្រាប់មួយនេះទេ?

តាមហាង

តើថែភ្លើងបន្ទាប់ចេញម៉ោងប៉ុន្មាន?

តាមស្ថានីយ៍

សូមឱ្យអន្ទង់មួយ។

តាមកោដិនីយដ្ឋាន ស៊ូស៊ី

ស៊ីស៊ីសម សម្រាប់ការសន្ទនា លក្ខណៈទេសចរណ៍

តើការចុះឈ្មោះចូលនៅម៉ោងប៉ុន្មាន?

តាមសណ្ឋាគារ

ខ្ញុំក្តៅខ្លួនតិចៗ។

តាមមន្ទីរពេទ្យ

Input results  
តើស្ថានីយនៅទីណា?

Translation results  
駅はどこですか。

Meaning of translation results  
តើស្ថានីយនៅកន្លែងណា?

日本語 ភាសាខ្មែរ  
ភាសាខ្មែរ

Hold to change language



**ប្រព័ន្ធស្វ័យប្រវត្តិកម្មបំលែងសំឡេងនិយាយភាសាខ្មែរទៅជាអត្ថបទសរសេរ**

ប្រអប់បង្ហាញអត្ថបទពីការបំលែងសំឡេងដែលអ្នកបាននិយាយ

ចុចលើរូប ដើម្បីចម្លងអត្ថបទ

ចុចលើរូប ដើម្បីលុបអត្ថបទ

ចុចលើរូប សម្រាប់និយាយ

**អំពីកម្មវិធី Khmer ASR**

ប្រព័ន្ធស្វ័យប្រវត្តិកម្ម Khmer Automatic Speech Recognition (**Khmer ASR**) គឺជាប្រព័ន្ធដែលប្រើប្រាស់បច្ចេកវិទ្យាបញ្ញាសិប្បនិម្មិតក្នុងការបំលែងសំឡេងនិយាយ និងឯកសារជាសំឡេង ជាភាសាខ្មែរទៅជាអត្ថបទសរសេរដោយស្វ័យប្រវត្តិ។

**ទាញយកកម្មវិធី**

QR code for Google Play

QR code for App Store

បង្កើតកម្មវិធីដោយ

**CADT**  
Cambodia Academy of Digital Technology





01

Chat GPT- 3/GPT-4



02

Quillbot



03

Adobe Express & Firefly



04

Grammarly



05

Otter



06

Fotor



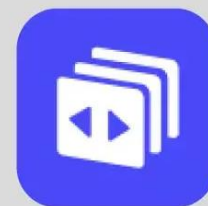
07

Google Bard



08

StepWise Math



09

Slidesgo



Cost-effective

Data security

Storage flexibility

Excellent Accessibility

Faster and flexible scalability









# What is DATA?



Data



Gold

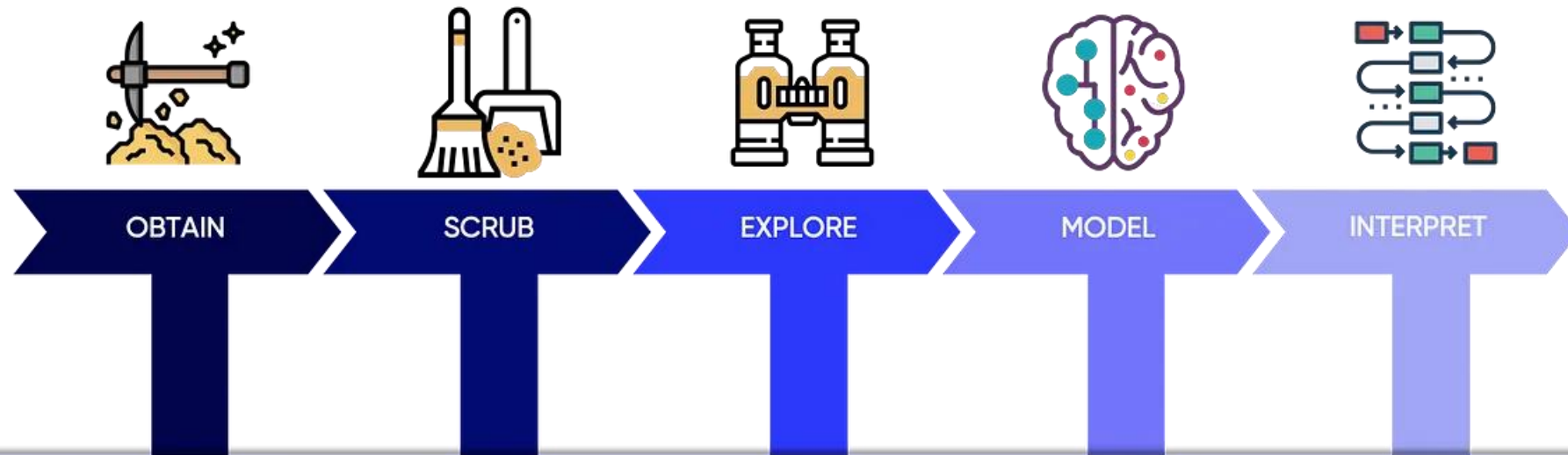
**DATA** is the **NEW OIL** or the **New GOLD** in this Digital Era!



1. How can we translate **data** into **gold**?
2. What impact do I want to make with this data?
3. What can be done to make the business run more efficiently?



## Data Science Process



**O**

Gather data from relevant sources

**S**

Clean data to formats that machine understands

**E**

Find significant patterns and trends using statistical methods

**M**

Construct models to predict and forecast

**N**

Put the results into good use

Identify data sets

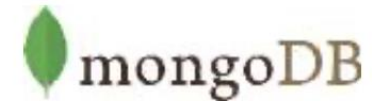
Retrieve data

Query data





Data comes from many places...



...with many ways to access it



## Data Quality Issues

**Real-world data is messy!**

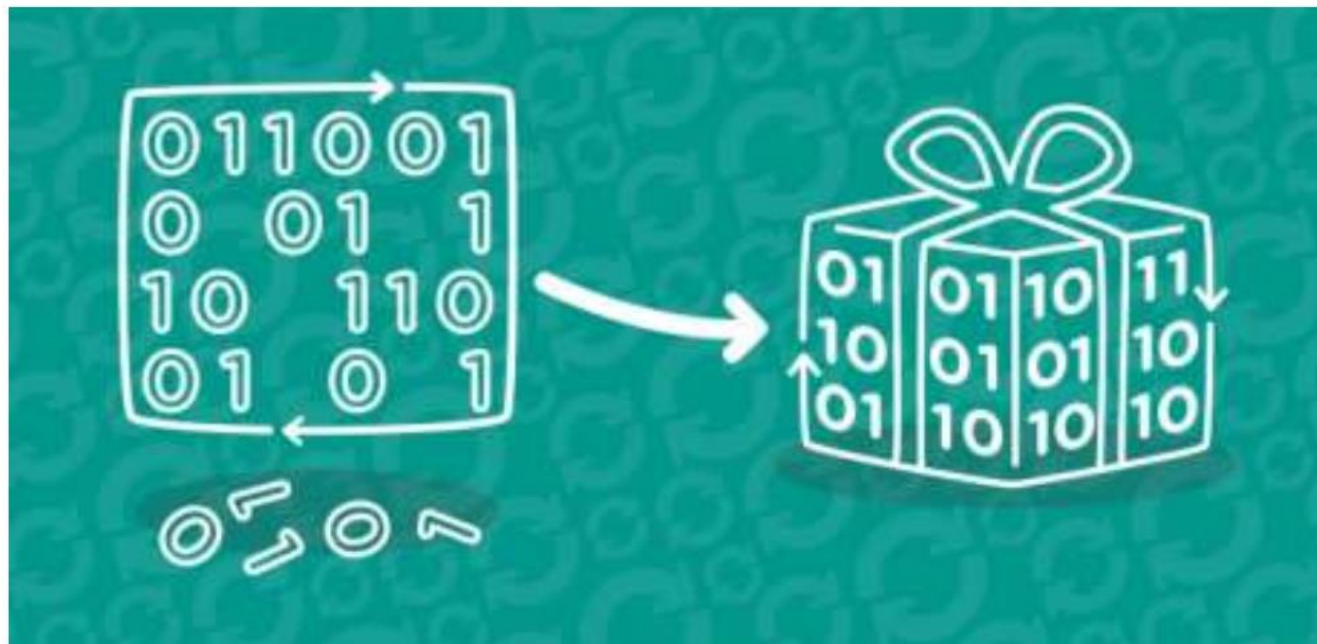
Inconsistent values

Duplicate records

Missing values

Invalid data

Outliers



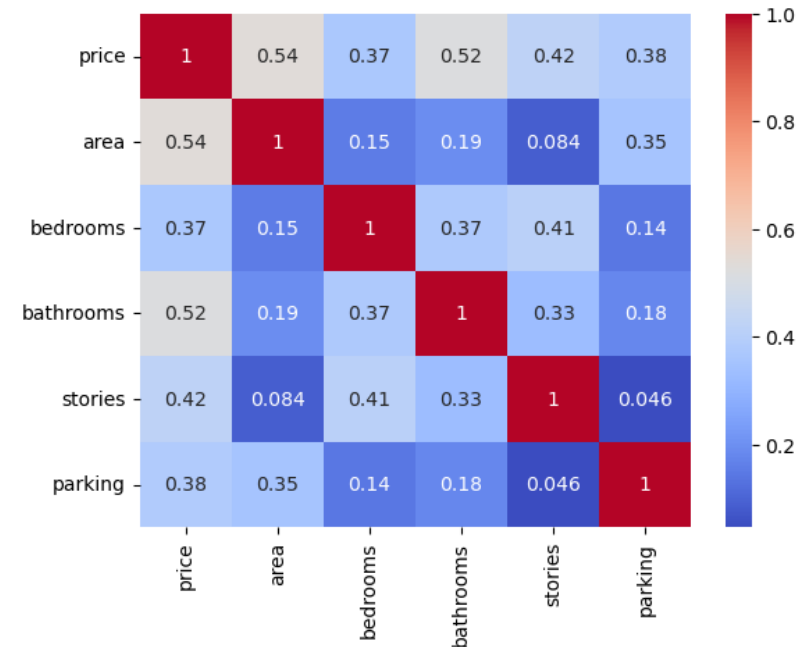
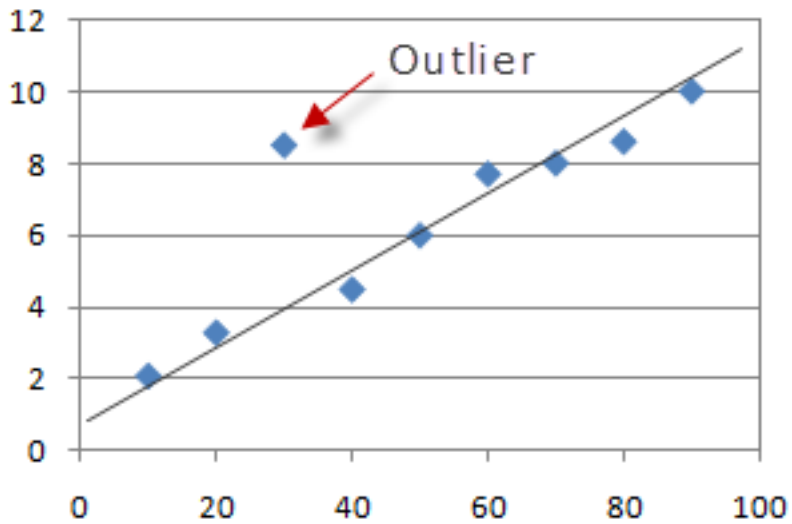
Clean

Integrate

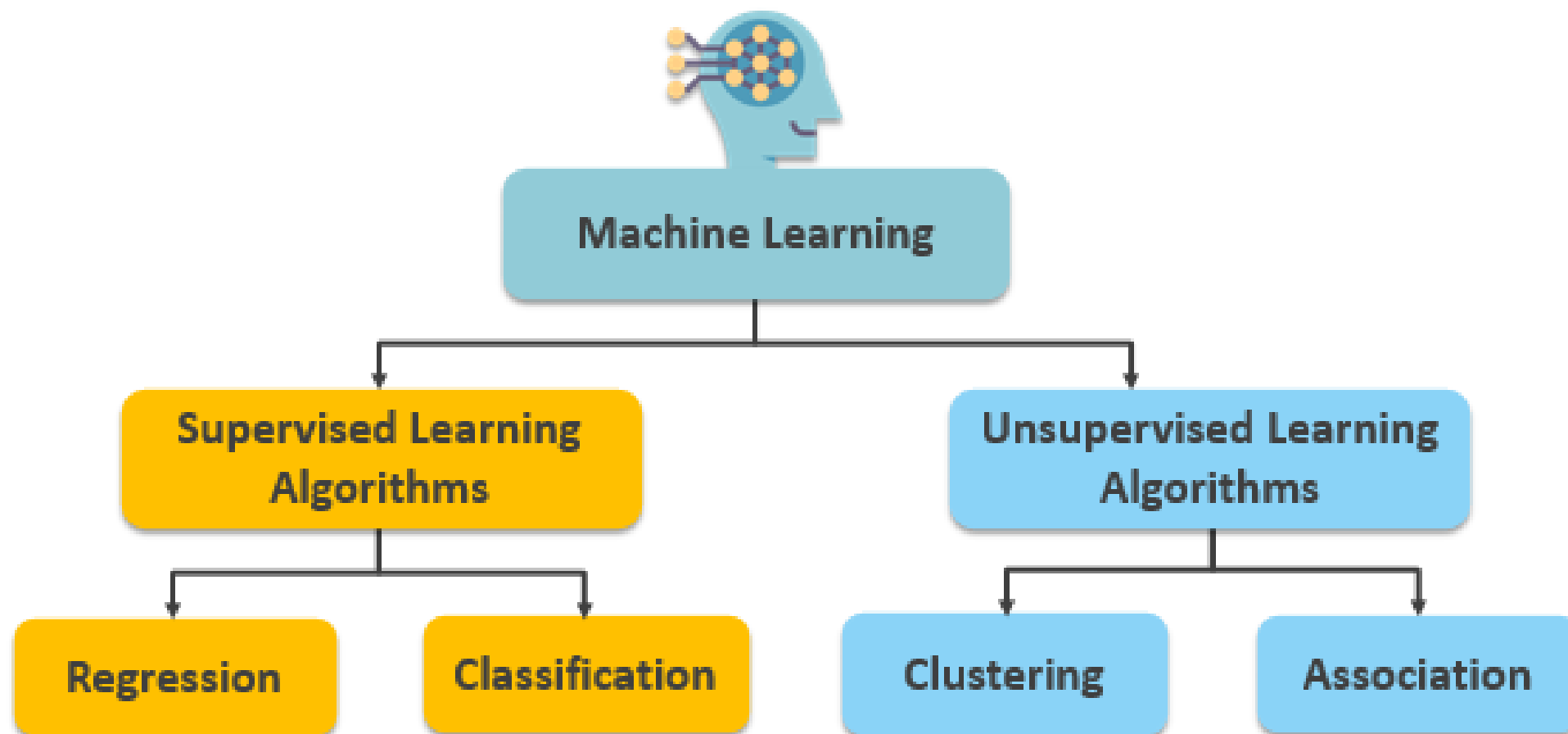
Package

Preliminary analysis

Understand the nature of data

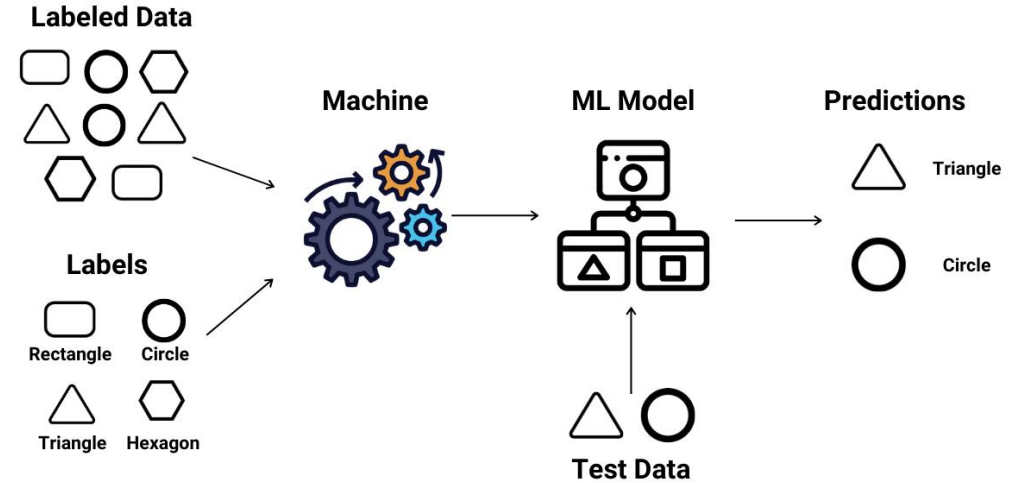






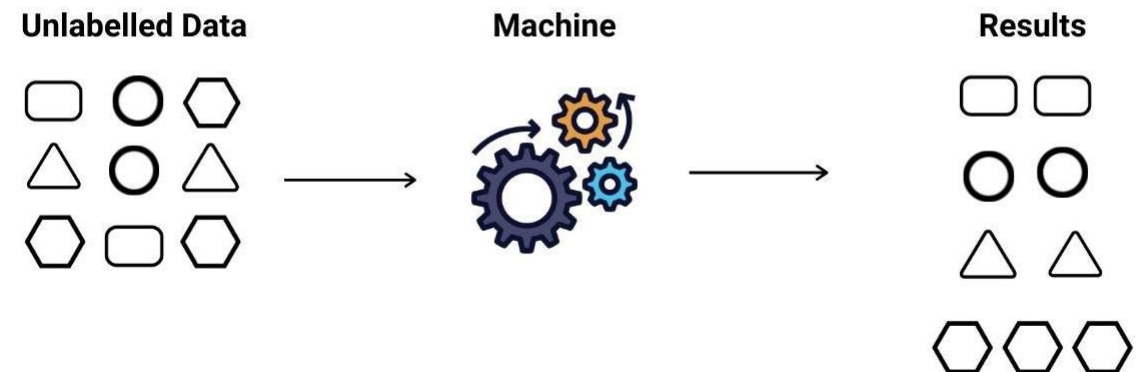
Training data is labeled.

## Supervised Learning



Training data is unlabeled.

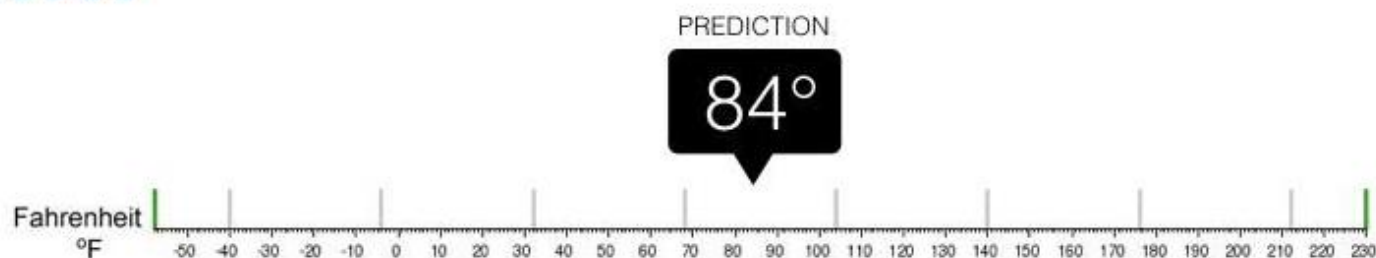
## Unsupervised Learning





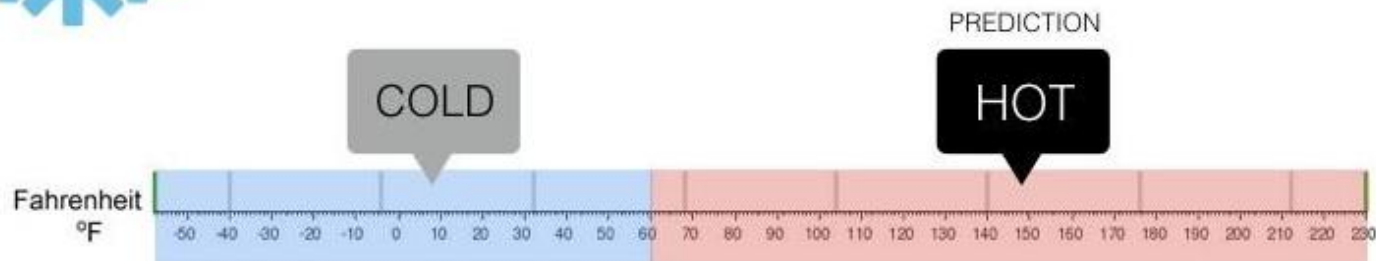
## Regression

What is the temperature going to be tomorrow?



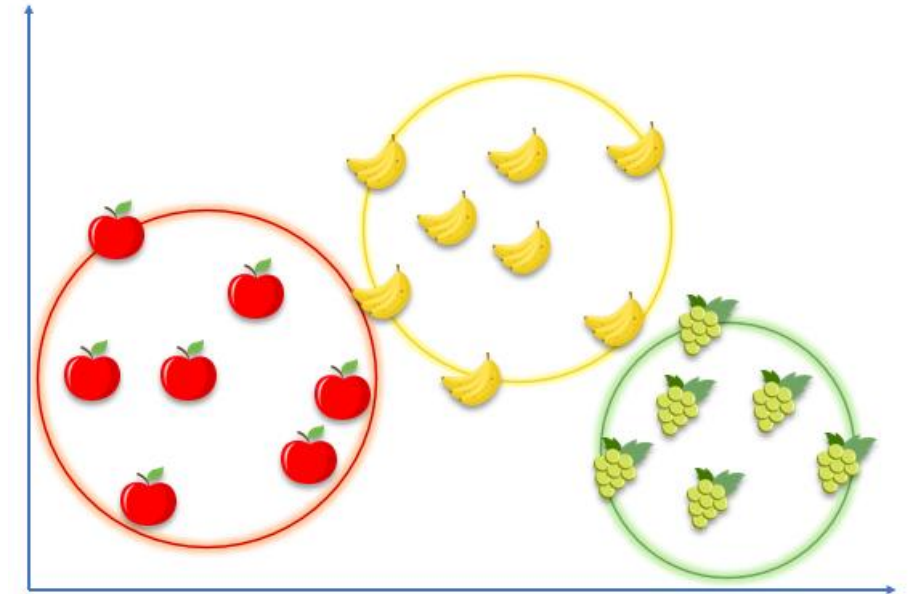
## Classification

Will it be Cold or Hot tomorrow?



## Clustering

## Association rule



### Products related to this item

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Sponsored ⓘ



Aanav OEM Laptop Adapter/Charger Compatible for Sony Vaio 19.5V 4.7A 90W...  
₹1,535.00



Kalco Self Supporting Stool Type Folding Aluminium Ladder - 3-19 ft. Flat Steps (K-...  
₹4,601.00



HP Pavilion 14 AMD Ryzen 5 14 inches FHD IPS Micro-Edge Anti-Glare Display Laptop (...  
★★★★☆ 236  
₹54,990.00 ✓prime



HP 15 (2021) AMD Ryzen 3-3250 8 GB RAM, 1TB HDD + 256GB SSD, 15.6 inches FHD Screen...  
★★★★☆ 2,425  
₹41,990.00 ✓prime



ZOUK Multicolored Printed Handmade Vegan Leather Women's Office Bag for 15.6...  
★★★★☆ 656  
₹1,999.00 ✓prime



HUO JI E-Yooso Z-88 RGB Mechanical Gaming Keyboard, Metal Panel, Red Switches, Comp...  
★★★★☆ 1,724  
₹4,999.00 ✓prime



Asus Vivobook X415EA-EB502TS i5-1135G7/8G/256G PCIe SSD/Transparent...  
₹47,238.00 ✓prime





Telling the story is key

To explain your findings through communication

To connect with people, to persuade, and to help them

Objective

Identify business insights

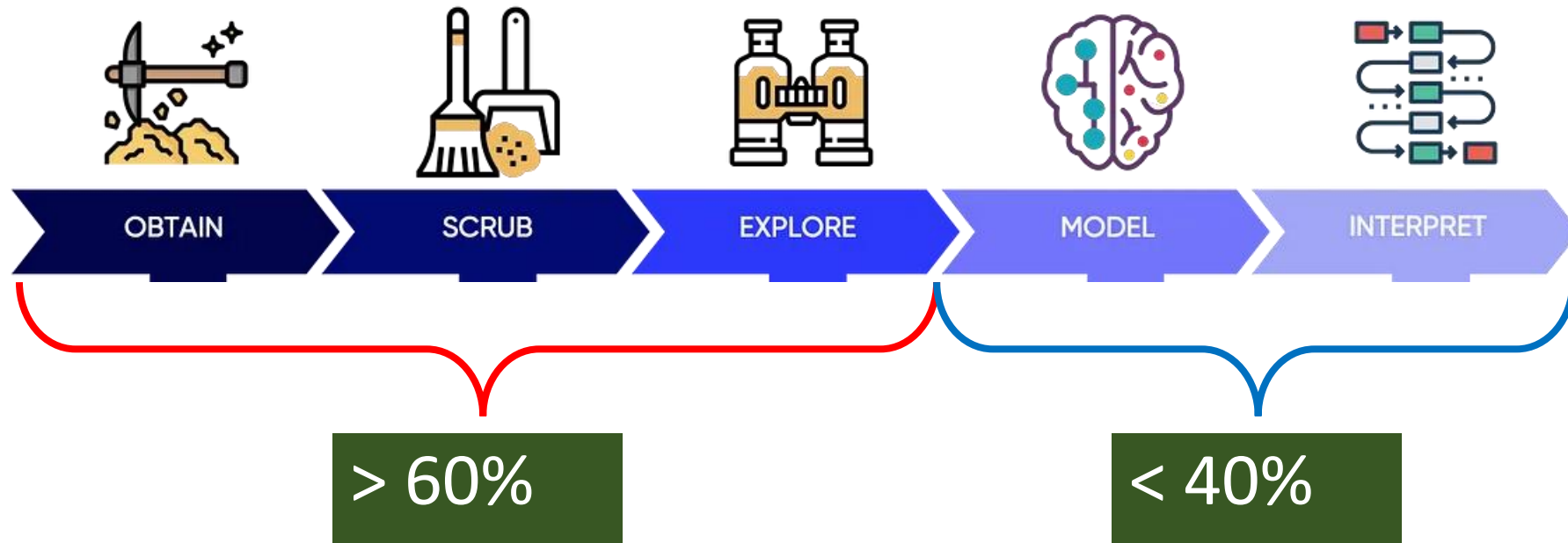
Visualize your findings accordingly

Tell a clear and actionable story





## Data Science Process



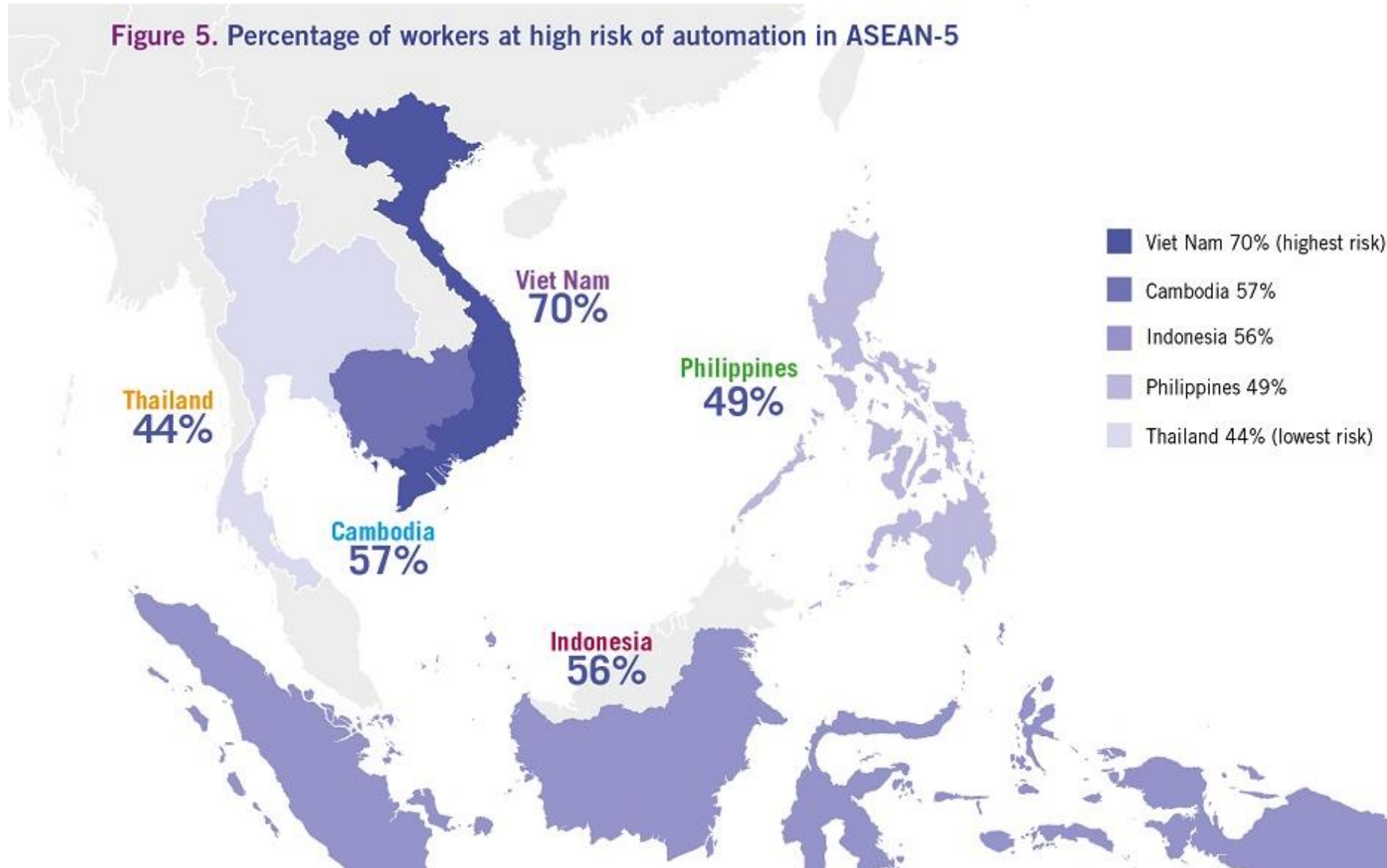
Skilled workforce

Cybersecurity risk

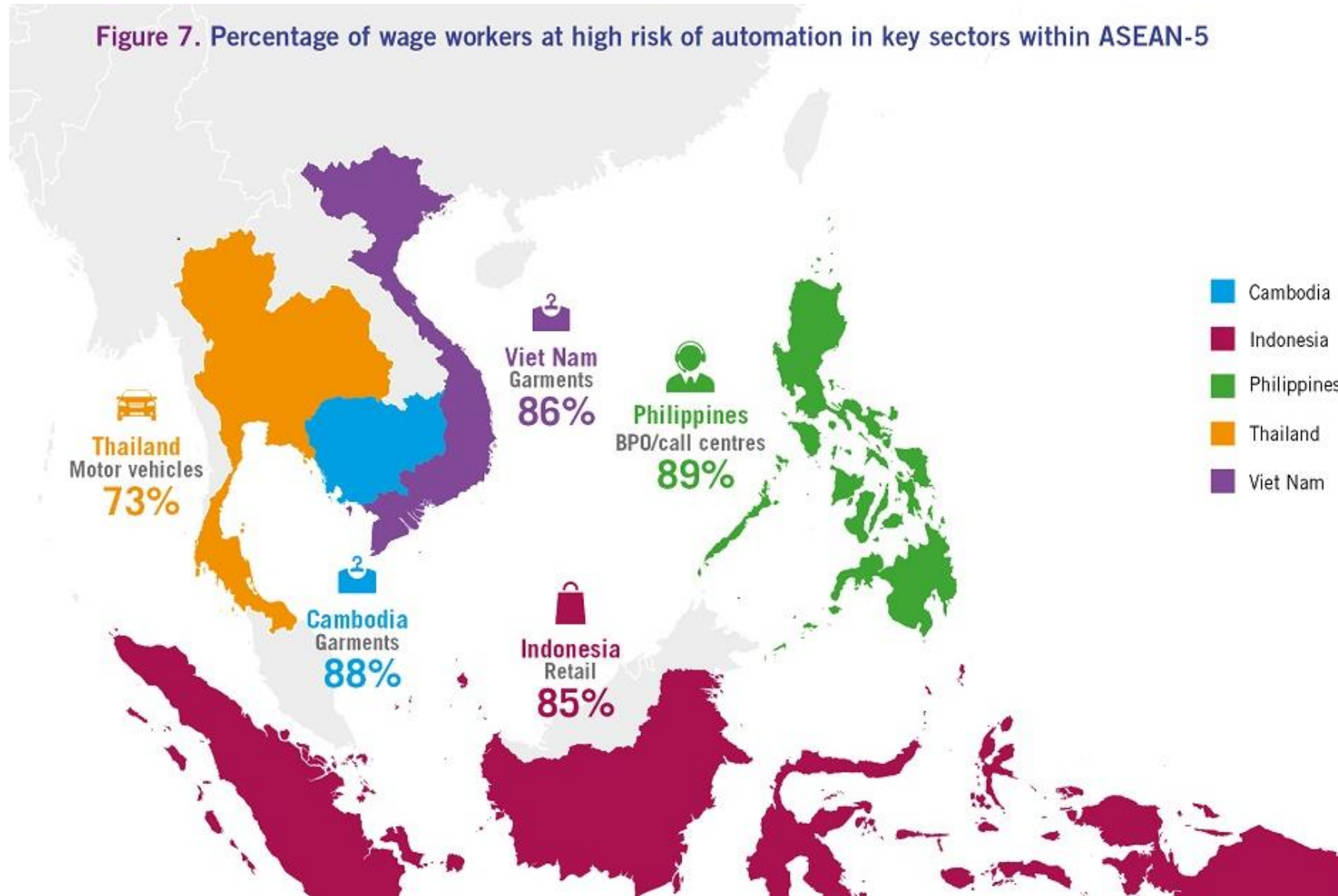
Stability and Reliability

Ethical issues

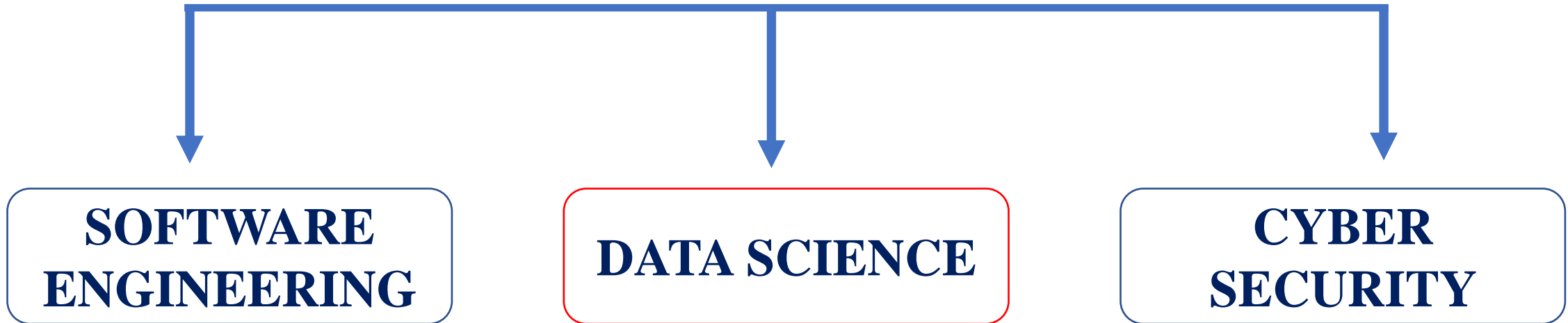




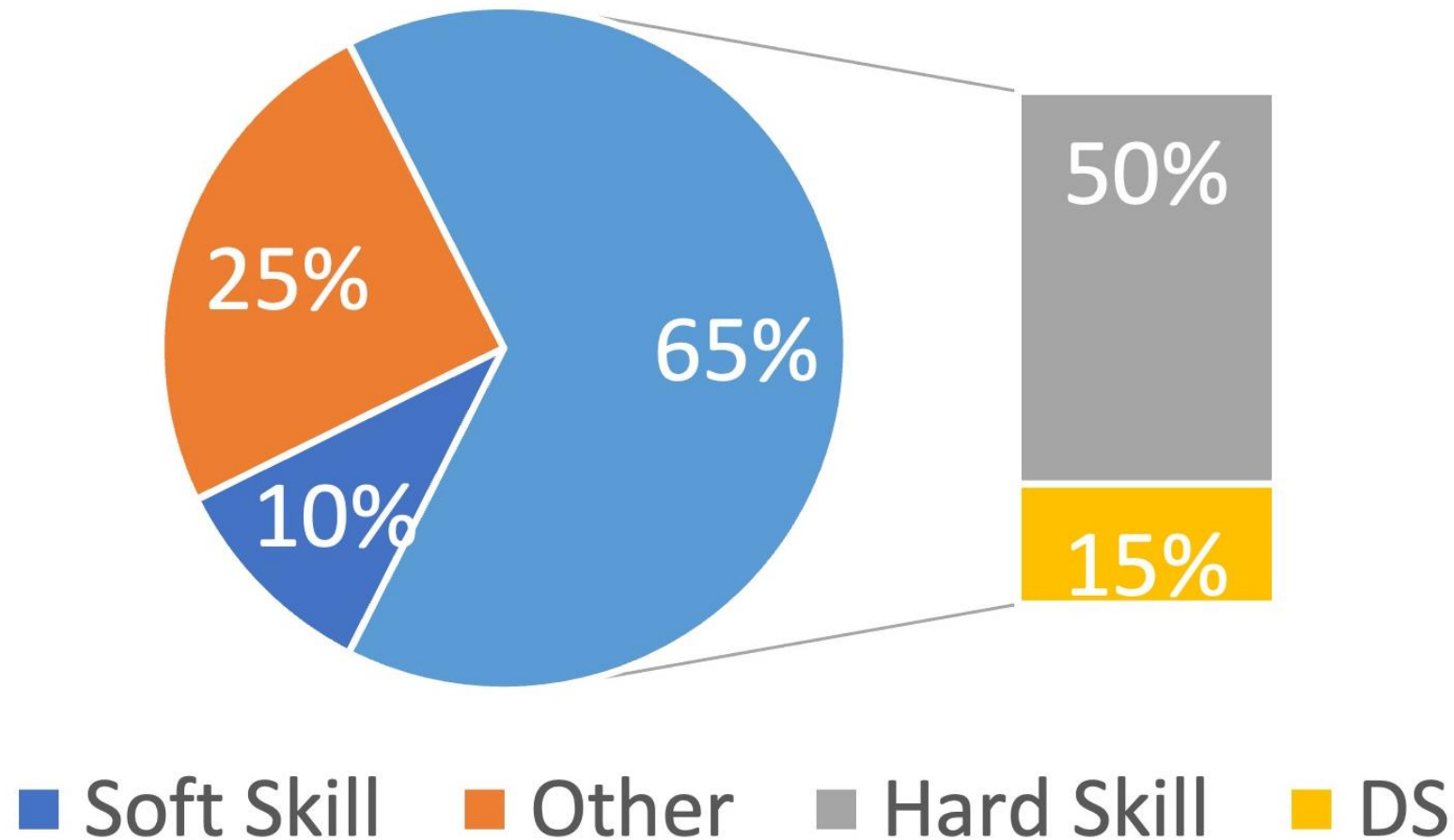




## Computer Science



## Skill classification





**ARE YOU READY?**

**YOUR FUTURE STARTS NOW!**