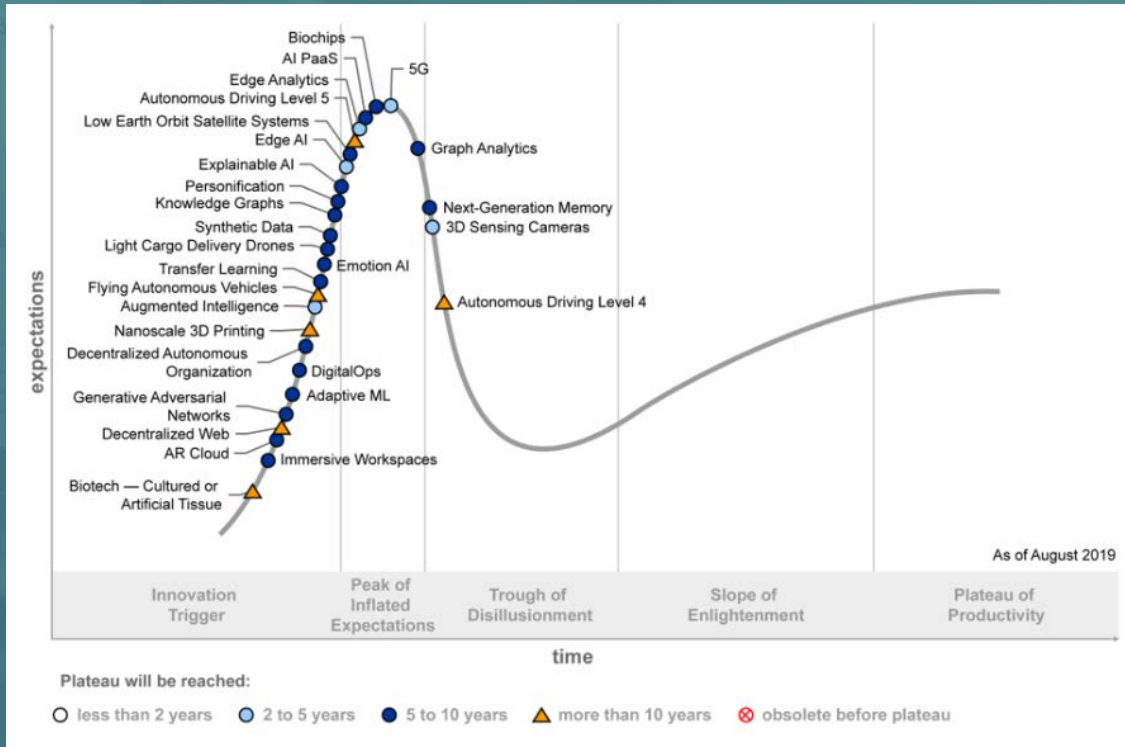# Digital Technology Implementation

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# Technology Trends (2019)



Source: Gartner (August 2019)

# Five Emerging Technology Trends

- Sensing & Mobility

- Augmented Human

- Postclassical Compute and Communication

- Digital Ecosystems

- Advanced AI & Analytics

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# Digital Technology <=> Computer System

- Hardware
- Software
- Peopleware
- Process
- Data
- Network & Communication

# Digital Technology <=> Computer System

- Hardware
  - ➤ Computer
  - ➤ Device

# Digital Technology <=> Computer System

- **Hardware**

  ➤ Computer

    o Microcomputer/personal computer(PC)

    o Minicomputer

    o Mainframe

    o Supercomputer

    o Cloud computing

  ➤ Device

# Digital Technology <=> Computer System

- Hardware
  - ➢ Computer

    Desktop

    | o Microcomputer/personal computer(PC) |

    Laptop/Notebook

    Tablet

    Smartphone

  - ➢ Device

# Digital Technology <=> Computer System

- Hardware
  - ➢ Computer
    - o Minicomputer



  - ➢ Device
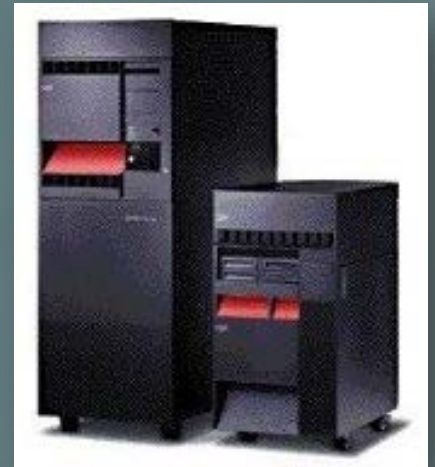
# Digital Technology <=> Computer System

- Hardware
  - Computer
    - Mainframe

  - Device

# Digital Technology <=> Computer System

- Hardware

  ➢ Comput

  

  o Super computer

  ➢ Device

# Digital Technology <=> Computer System

- Hardware

  ➢ Computer

    o Cloud computing

  ➢ Device

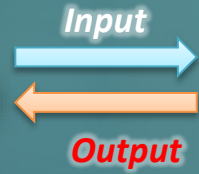# Digital Technology <=> Computer System

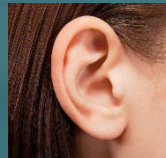- **Hardware**
  - ➤ Computer
  - ➤ Device
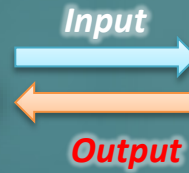    - o Input Device
    - o Output Device

User Interface (UI)

# User Interface (UI)

Input

Output

**5 Human senses**

# User Interface (UI)



*Input*

*Output*

**Eye**



### Input

- Face recognition
- Retinal scan



### Output

- LCD monitor
- LED monitor
- Smart TV
- Projector
- Hologram



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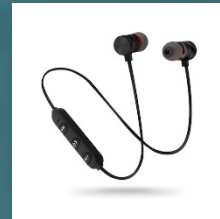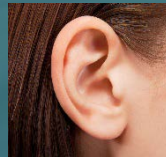
# User Interface (UI)
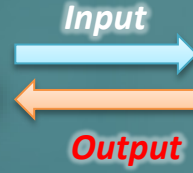
**Input** → 

← **Output**

## Input

- 

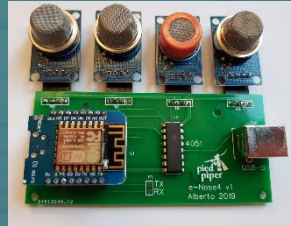## Output

- Speaker
- Earphones

*Ear*
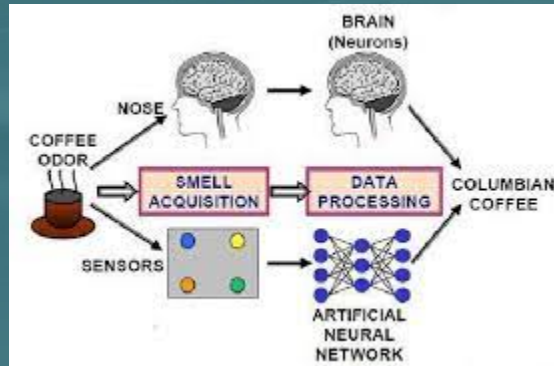
Chalermpol Tapsai
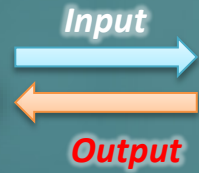
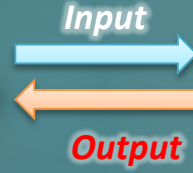# User Interface (UI)

*Input*

- Enose sensor

*Nose*

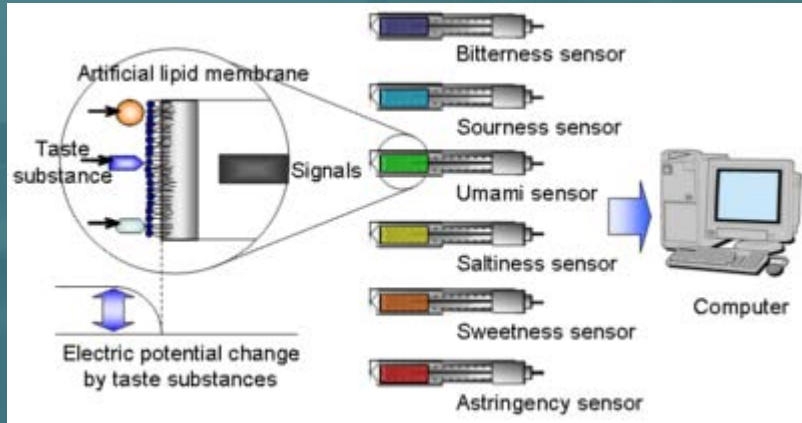*Output*

- smell synthesizer

# User Interface (UI)

*Input*

- Microphone
- Taste sensor



*Mouth and Tounge*

*Output*

- ?

# User Interface (UI)

## Input

- Touch screen
- Fingerprint scan
- Keyboard
- Mouse
- ?

## Output

- Augmented Human

**Body**

# Digital Technology <=> Computer System

- **Software**

  ➤ Operating system (OS)

  ➤ Application software

Google map

Tiktok

SPSS

Word

Wechat

Windows

IOS

Linux

Line

Photoshop

Excel        Android

Harmony

Expedia

Unix

Youtube        Powerpoint

Facebook

# Digital Technology <=> Computer System

- **Software**

  ➢ Operating system (OS)

  ➢ Application software

**Computer languages**

- C
- Java
- Python
- R

- HTML
- SQL
- XML
- ..........

Natural Language?

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# Digital Technology <=> Computer System

- **Peopleware**
  - ➢ Computer engineer
  - ➢ System Analyst
  - ➢ Programmer
  - ➢ Operator
  - ➢ User

# Digital Technology <=> Computer System

- **Peopleware**

Requirements for Digital Technology transformation

- ➤ Mindset
- ➤ Knowledge
- ➤ Skills

# Digital Technology <=> Computer System

- Data

  - ➢ Files

  - ➢ Database

  - ➢ Data warehouse

  - ➢ Big Data

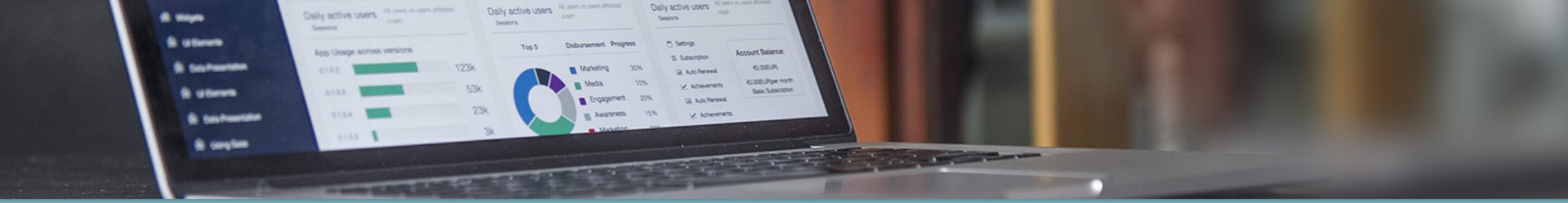  - ➢ Local data

  - ➢ Global data

- Website
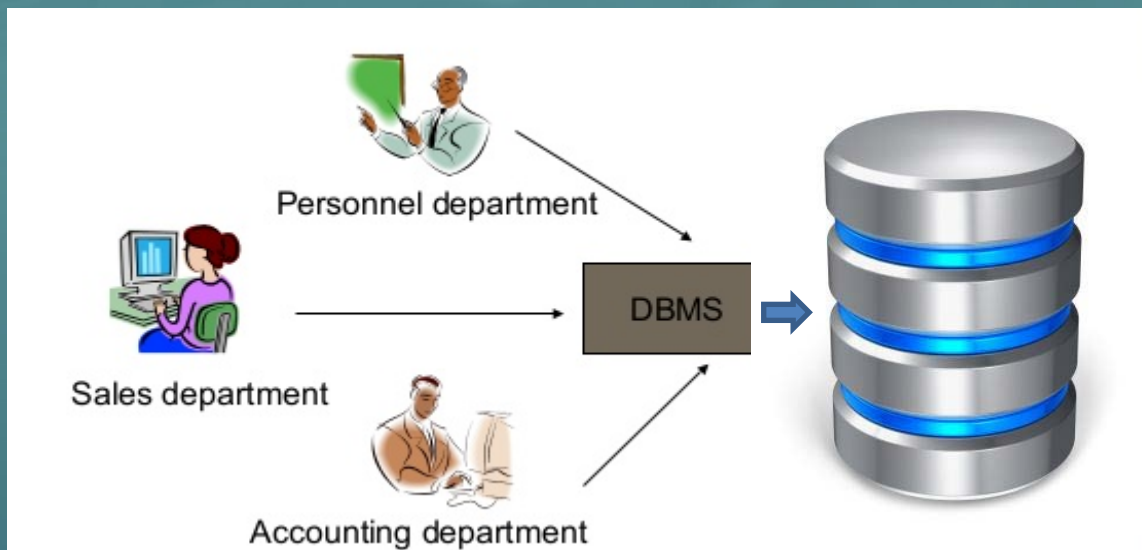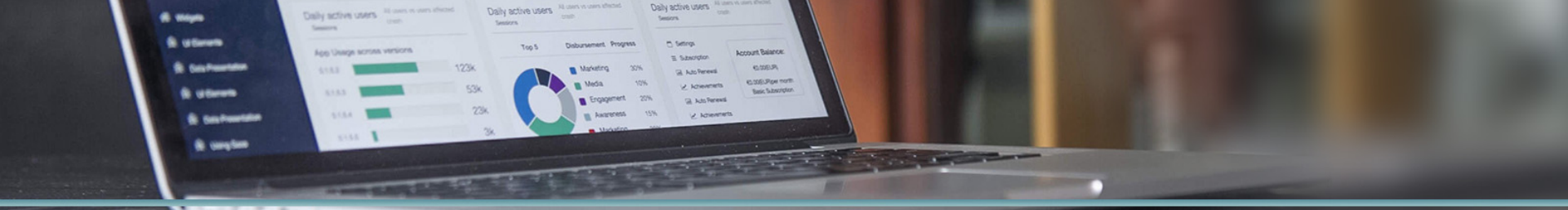- Social network
  - – Facebook
  - – Tiktok
  - – Youtube
  - – Wechat
  - – Line

# Database



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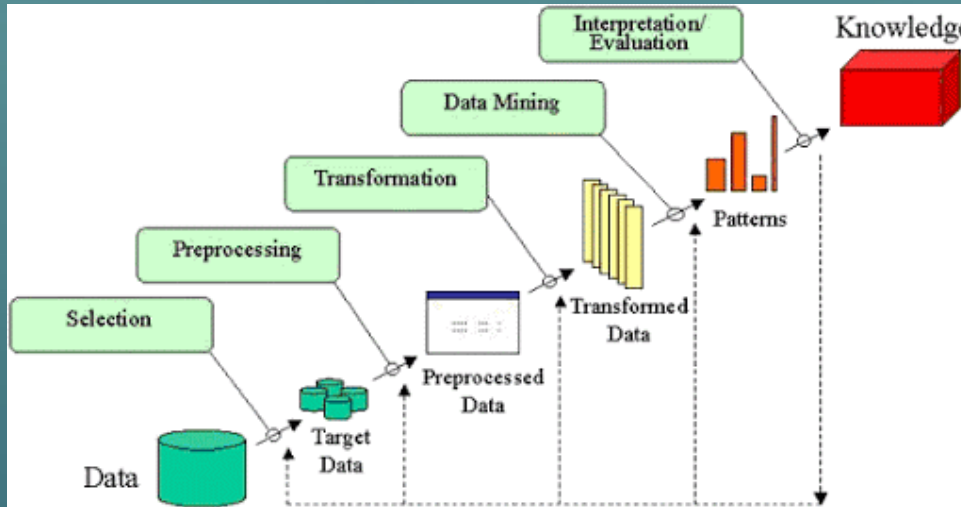
- **VOLUME**
- **VARIETY**
- **VELOCITY**

# Digital Technology <=> Computer System
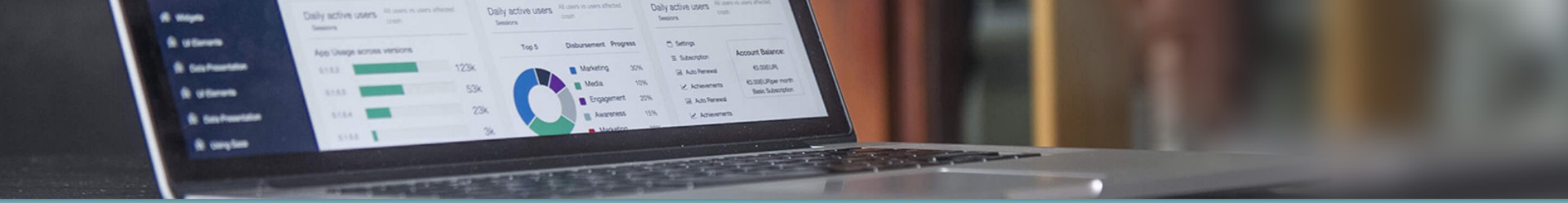
- **Processing**
  - ➢ Data Science
  - ➢ Data mining
  - ➢ Text processing
  - ➢ image processing
  - ➢ Video Processing
  - ➢ Natural Language Processing
  - ➢ OCR (Optical Character Reader)
  - ➢ Voice Recognition (Speech to text)
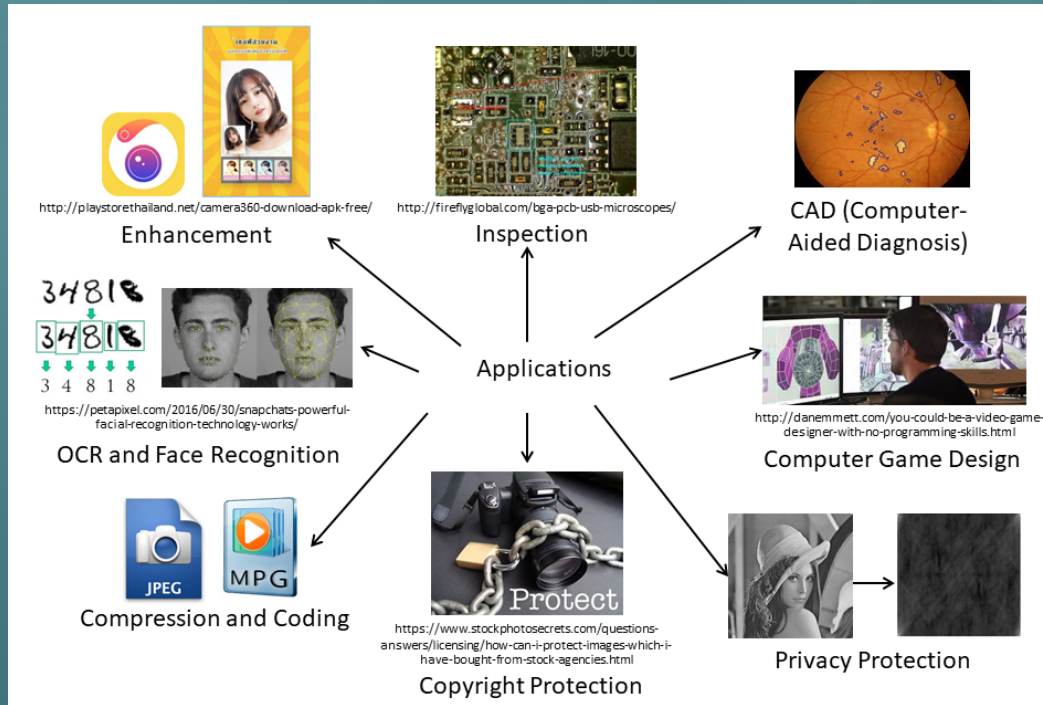  - ➢ Voice Synthesis (Text to Speech)

# Data mining



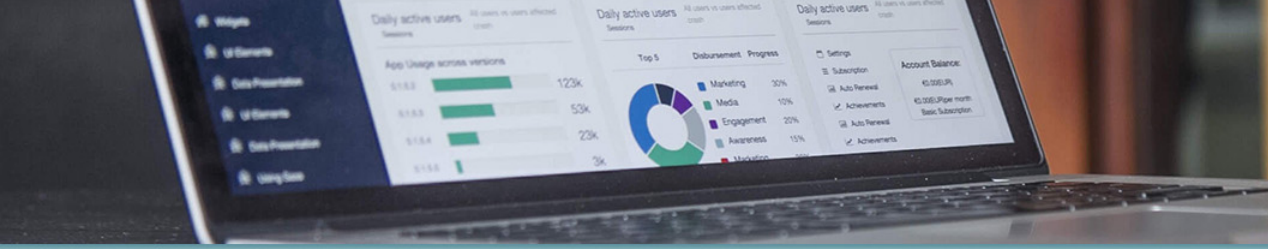- **Prediction model**
- **Clustering**
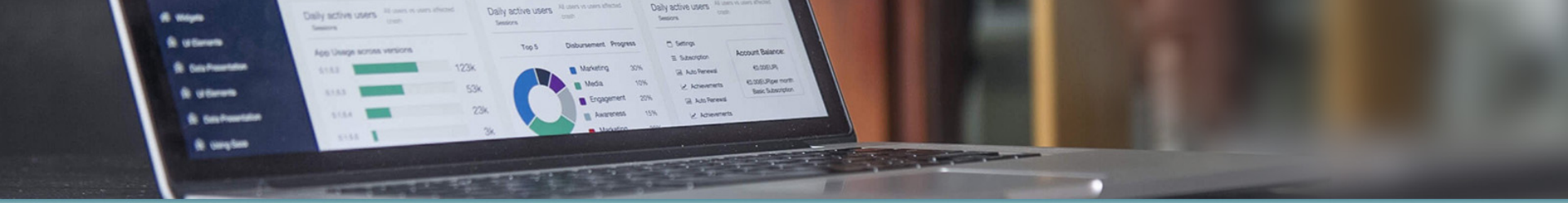- **Association rules**

# Text processing



Sentiment Analysis

Keyword Extraction

Topic Detection

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# Image processing



Enhancement
http://playstorethailand.net/camera360-download-apk-free/

Inspection
http://fireflyglobal.com/bga-pcb-usb-microscopes/

CAD (Computer-Aided Diagnosis)

OCR and Face Recognition
https://petapixel.com/2016/06/30/snapchats-powerful-facial-recognition-technology-works/

Computer Game Design
http://danemmett.com/you-could-be-a-video-game-designer-with-no-programming-skills.html

Compression and Coding

Copyright Protection
https://www.stockphotosecrets.com/questions-answers/licensing/how-can-i-protect-images-which-i-have-bought-from-stock-agencies.html

Privacy Protection

Applications
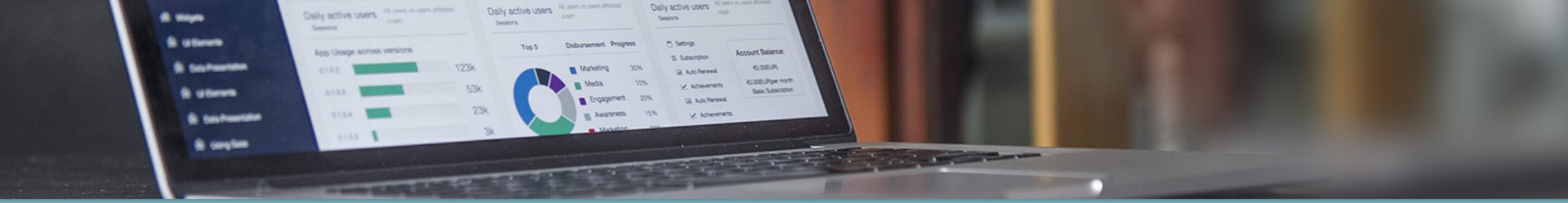
# Video processing



Chalermpol Tapsai
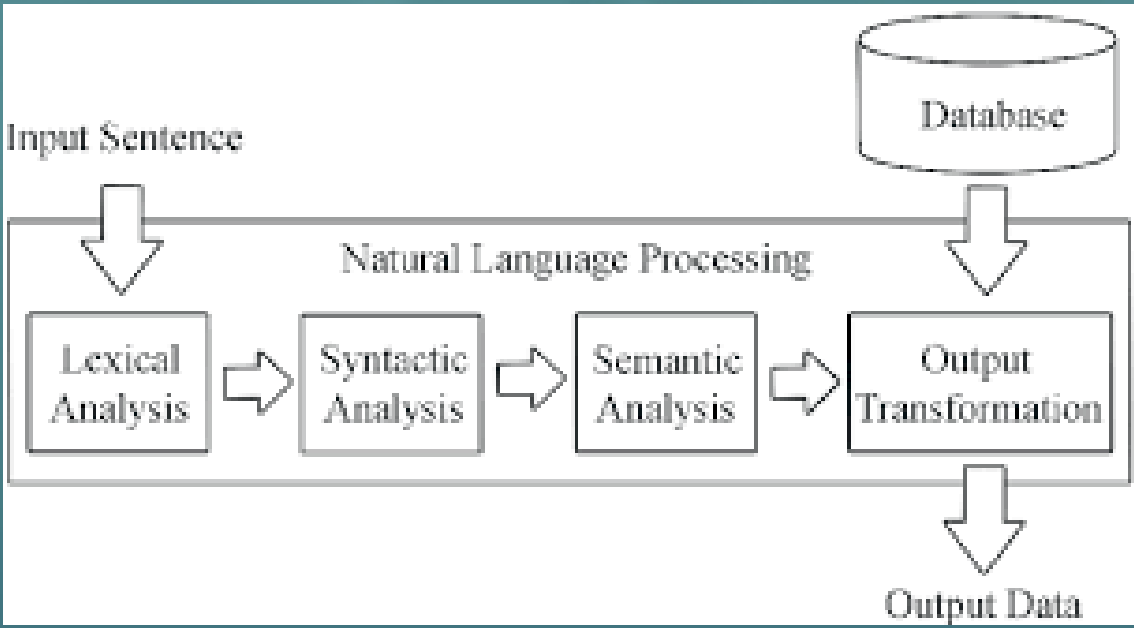
# Speech processing

Text to Speech

Speech recognition

Speech to text

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# Natural Language Processing (NLP)

# Digital Technology <=> Computer System

- **Network & Communication**

  ➢ Computer network

    - LAN (Local Area Network)
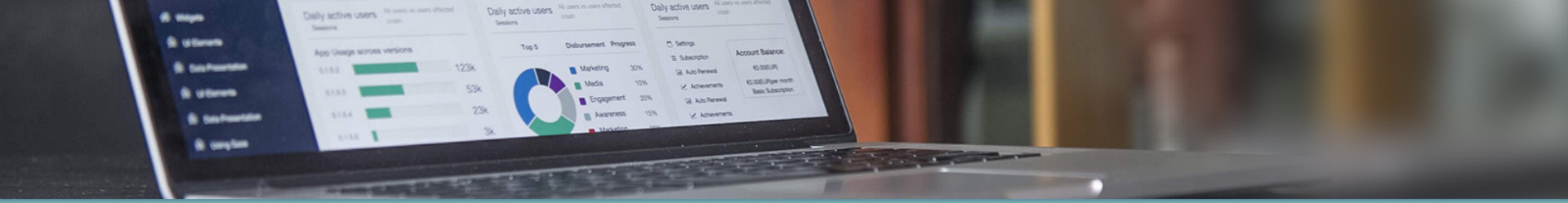    - WAN (Wide Area Network)
    - MAN (Metropolitan Area Network)

  ➢ Data communication

    - Wire network
    - Wireless network

# Augmented Human

- Augmented intelligence
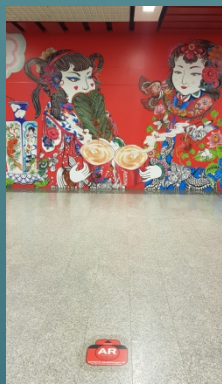- Emotion AI

VR **(Virtual Reality)**

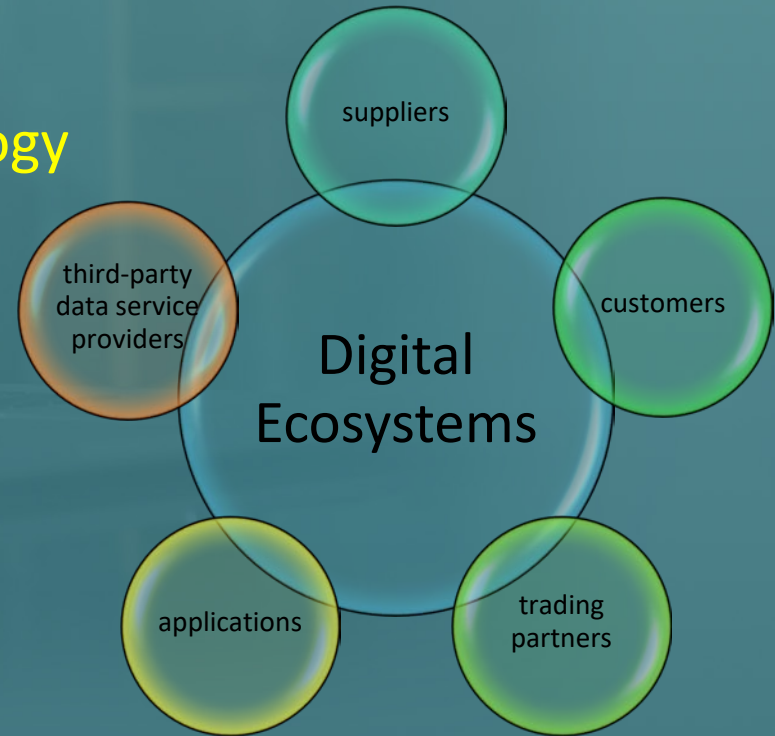Google maps + street view

AR (Augmented reality )

# Postclassical Compute and Comms

- 5G, 6G
- next-generation computing
- 3D printing

# Digital Ecosystems

a group of interconnected information technology resources that can function as a unit

# Advanced AI and Analytics

- Autonomous system
- Robot
- Remote monitoring
- Natural language processing [NLP]
- Facial recognition
- Video analytics
- Machine learning (ML)
- Deep learning (DL)

# Autonomous system



- UAV(Unmanned Aerial Vehicle)
- Autonomous car

# What will be in the future

?