innovative logistics

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Innovative Logistics

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Application Development

Siebe Vervoort
Internet of Things

Teemu Tiainen
Artificial & Business Intelligence

Senne Deckx
Cloud & Cyber Security

Simon Duchateau
Cloud & Cyber Security

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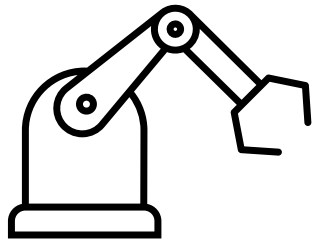
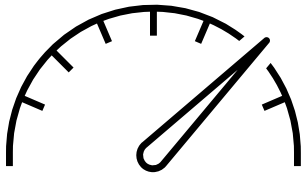
Introduction



Automation

Speeds up the process and requires less staff



Monitoring

Shows the weaknesses of the process and shows where time can be saved

Instructions

Guides the truckdriver to the bay faster

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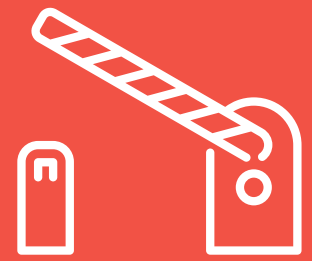
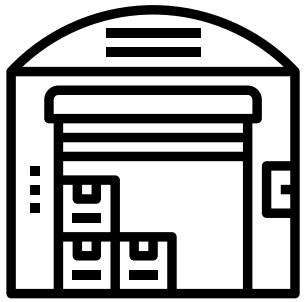
Logistics process



Arrival at premises

The process starts with the arrival of the truckdriver at the premises



Driving to loading bay

Barrier opens and the driver drives to the loading bay

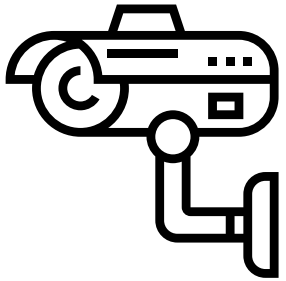
Leaving the premises

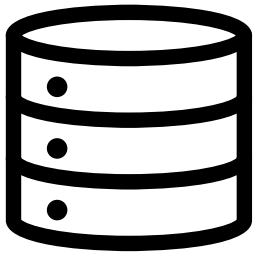
Leaves the docking bay and drives to the exit to leave the premises

Arrival at the premises

Number plate gets scanned/RFID Gets read

Step 1



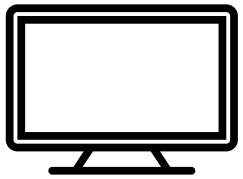


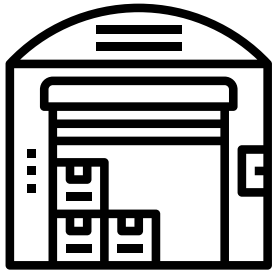
Step 2

Truck gets checked if it's already in database

Screen at entrance displays bay number

Step 3





If yes? → Next step

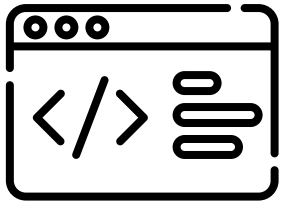
Step 4

If no? → pop-up on the program for manually linking it to a Truck company and putting it in the database

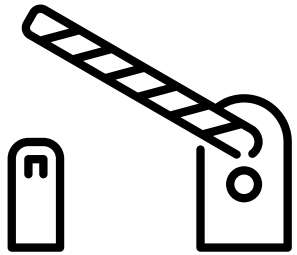
Correct loading bay light turns on/gate opens

Bay is marked "in use" in our program

Step 5



Logistics process



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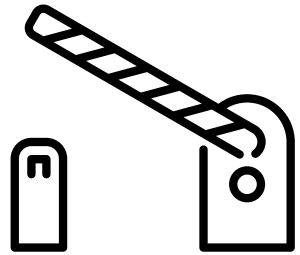

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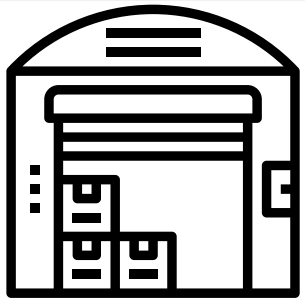

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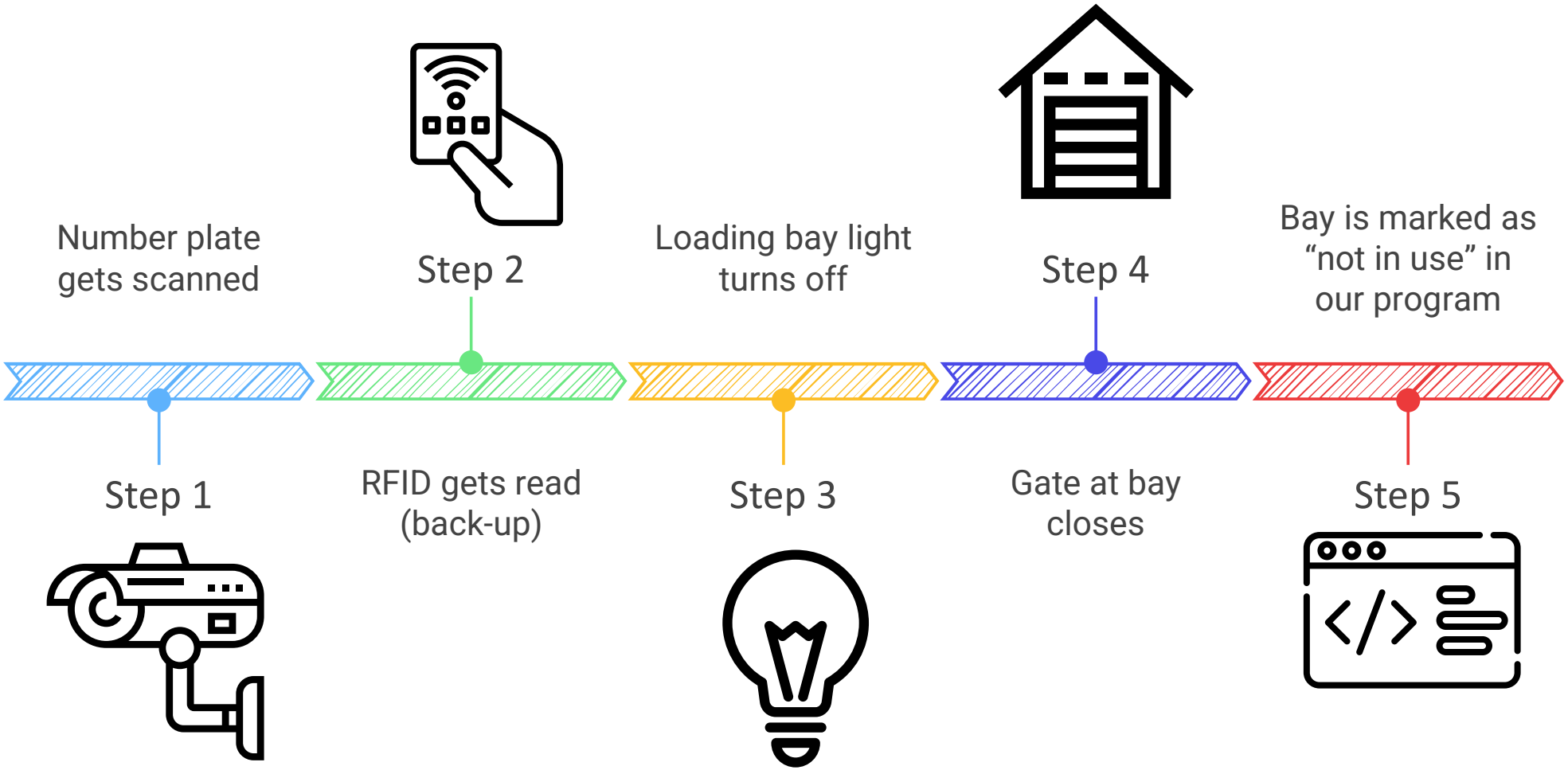

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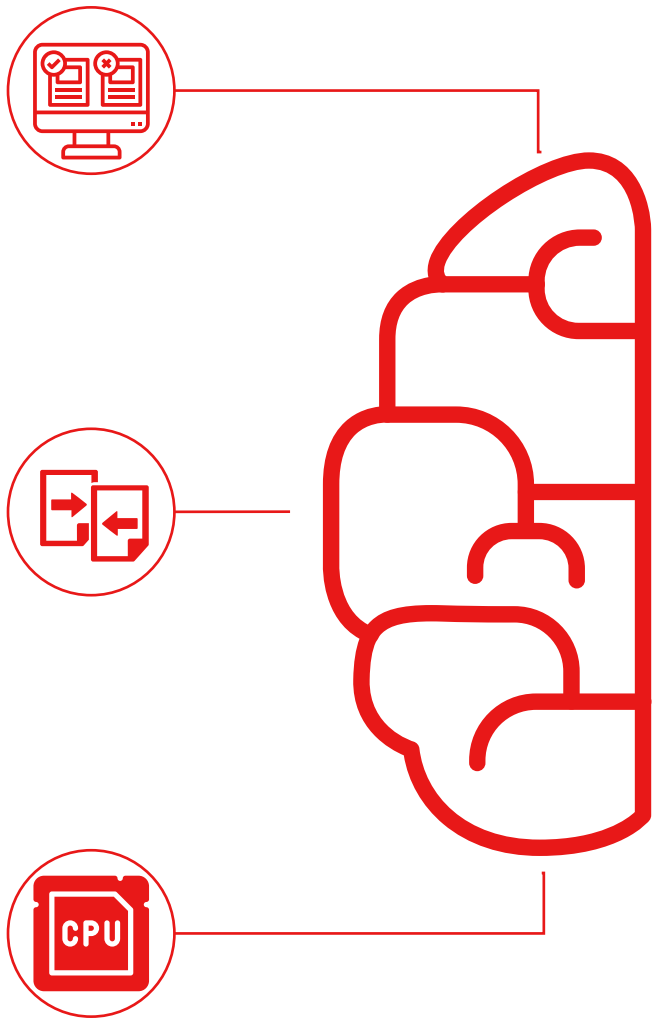
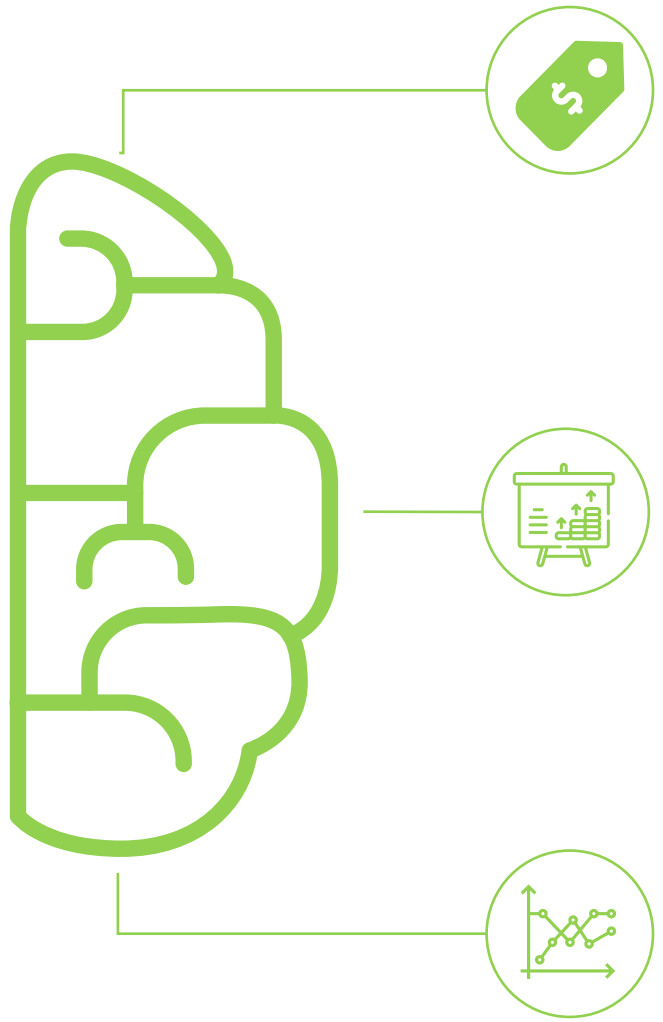
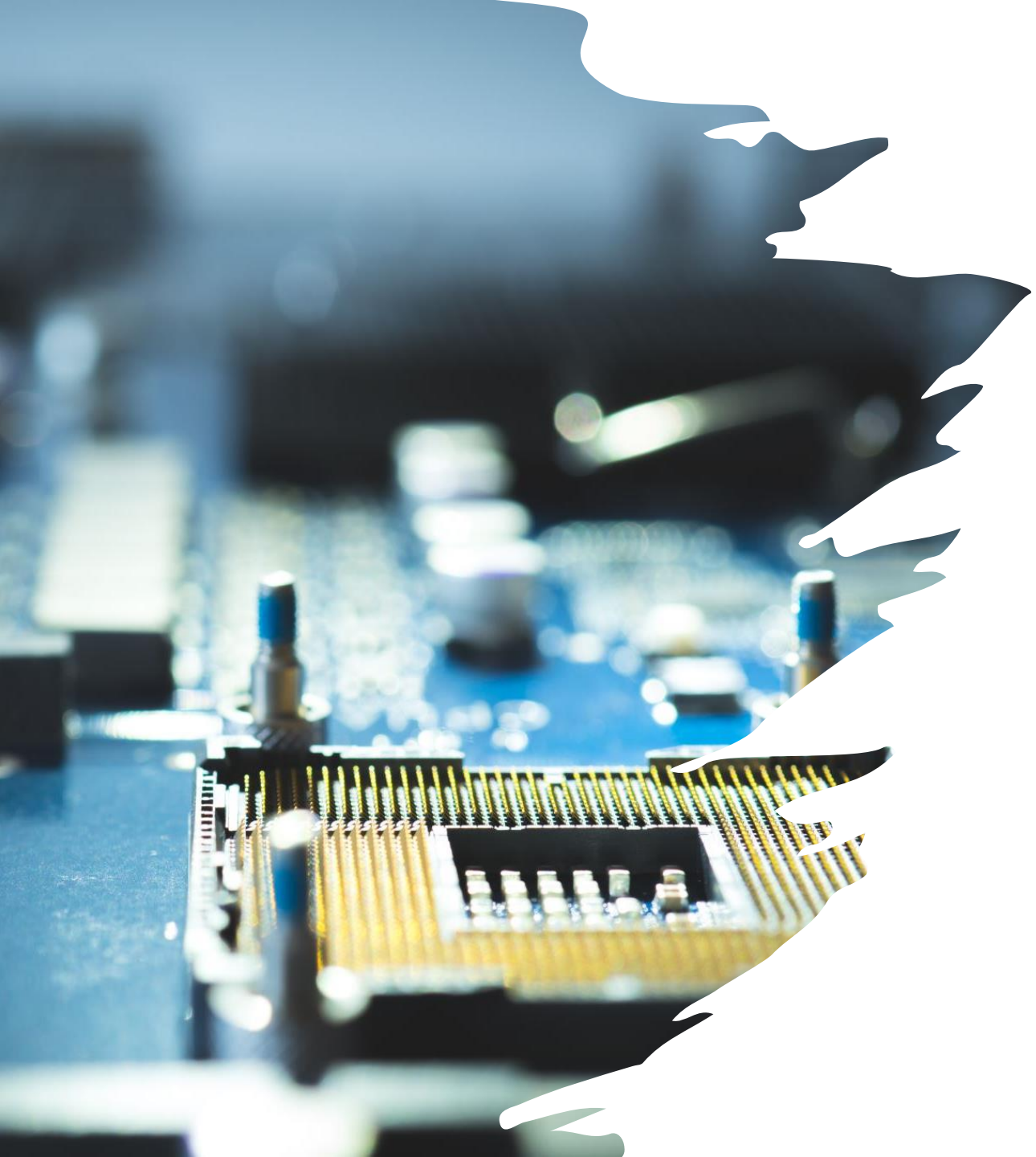


Framework





Introduction

- Comparing frameworks
- Server-side (backend)
  - Spring
  - Laravel
- Client-side (frontend)
  - Angular
  - React
- Expectation => Server-side application

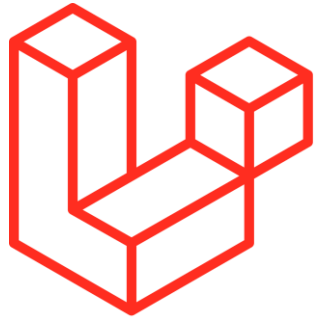
Conclusion - Framework

Server-side application

Handle data

Visualization software

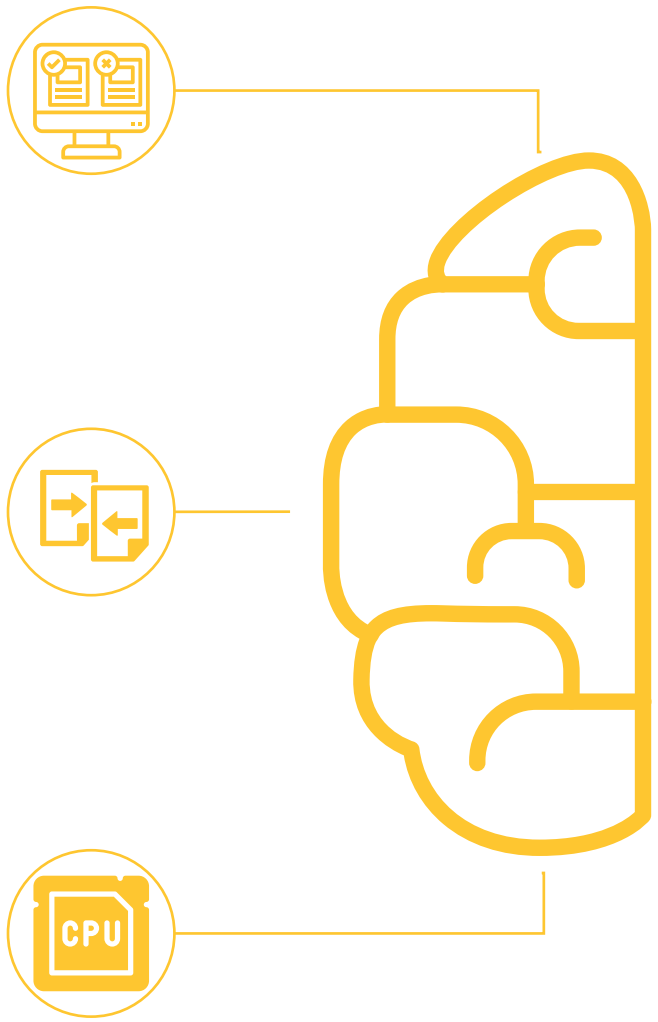
- Link between user and framework



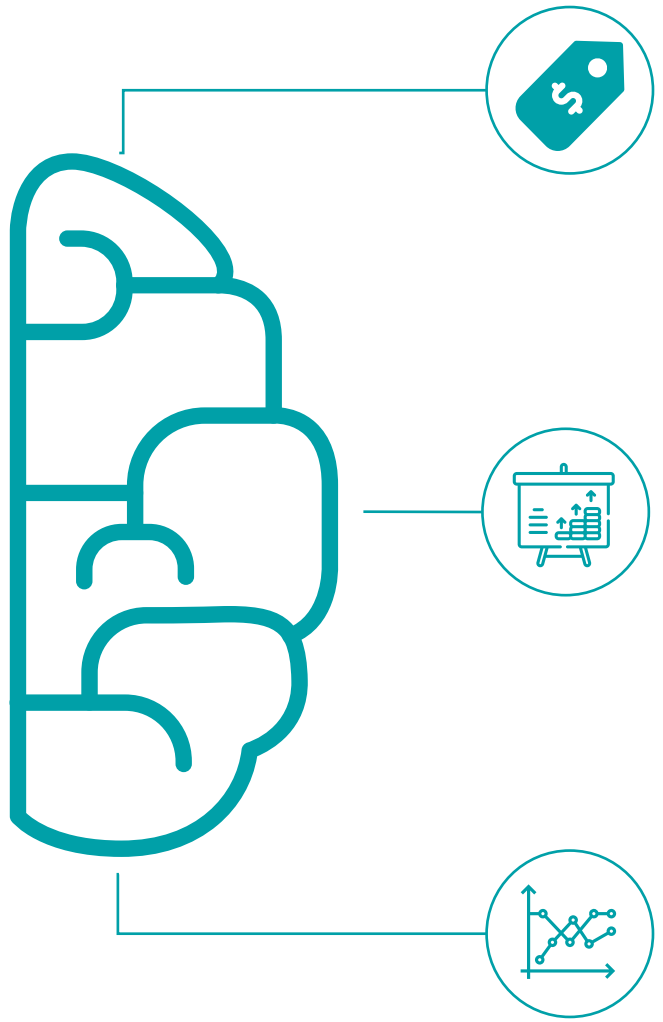
Laravel

High performance

Well-documented



Visualization



Introduction

Software

Real-time

Custom widgets

Retrieving data

Visualization

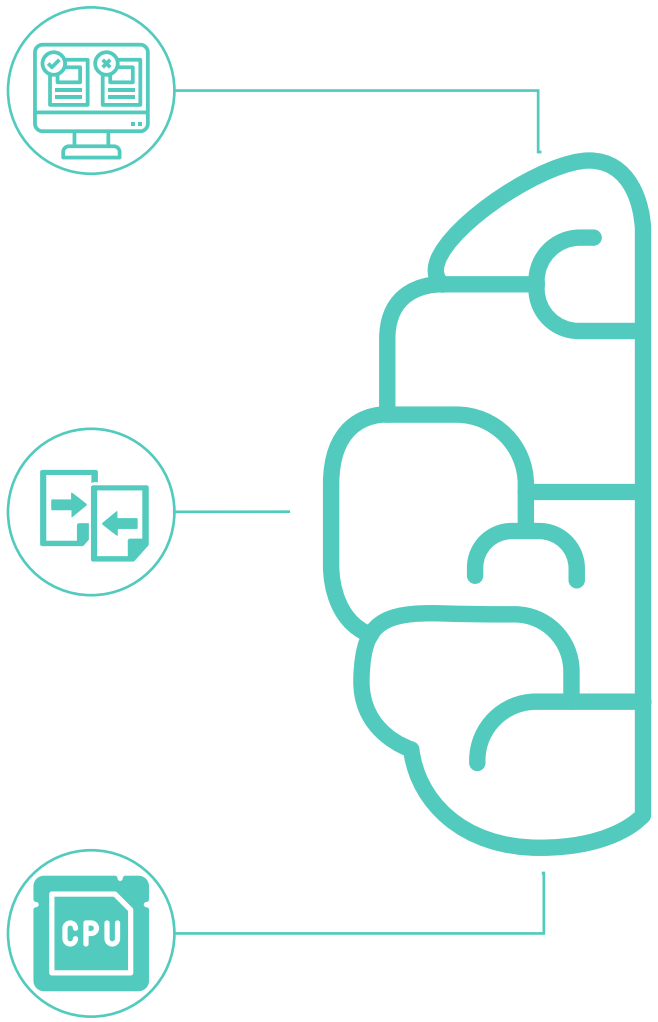
Simple & clear

Different KPI's

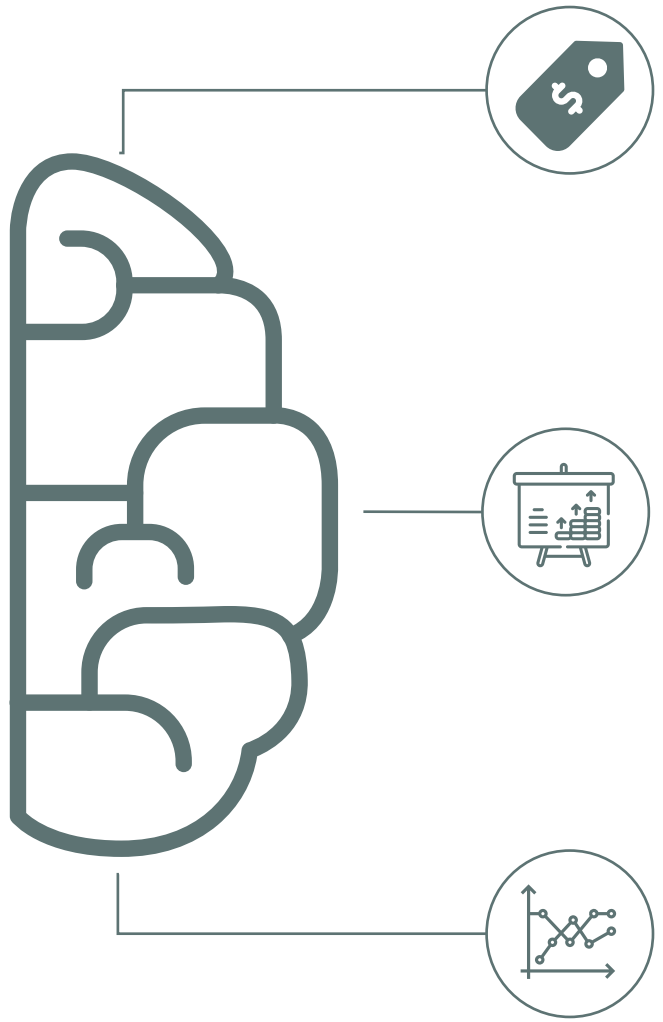
Conclusion – Power BI

- Support for real time dashboards
  - Custom visuals
  - Dashboard templates
- Great documentation & support
- Compatibility with Azure
- Experience
- Low price point
  - 8,40€/month/user

Low-fidelity prototype



On-premises solution



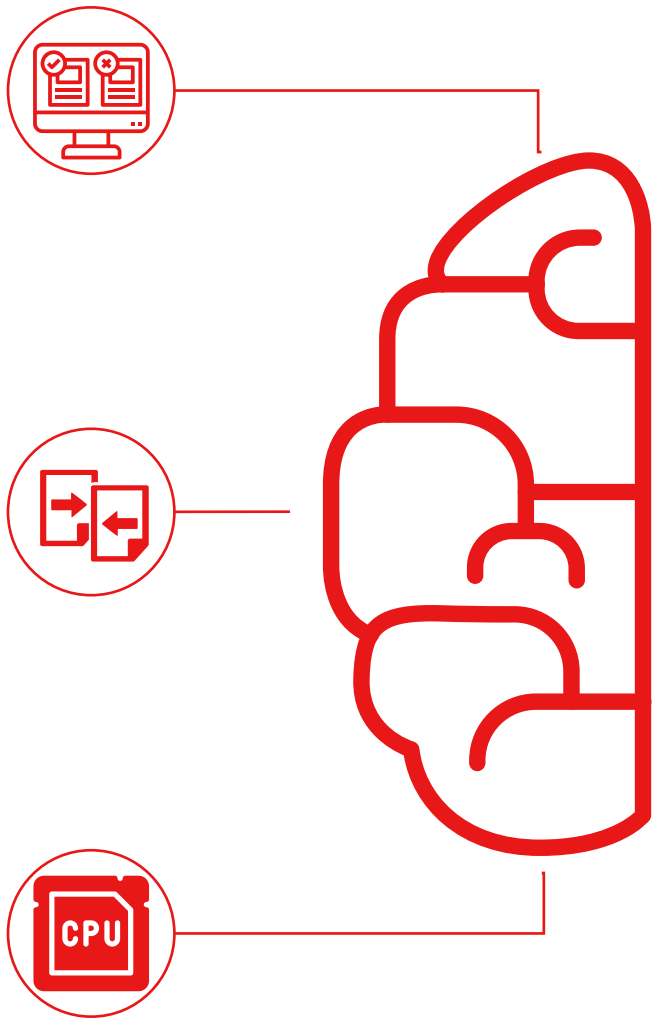
Introduction

WHAT IS ON-PREMISES?

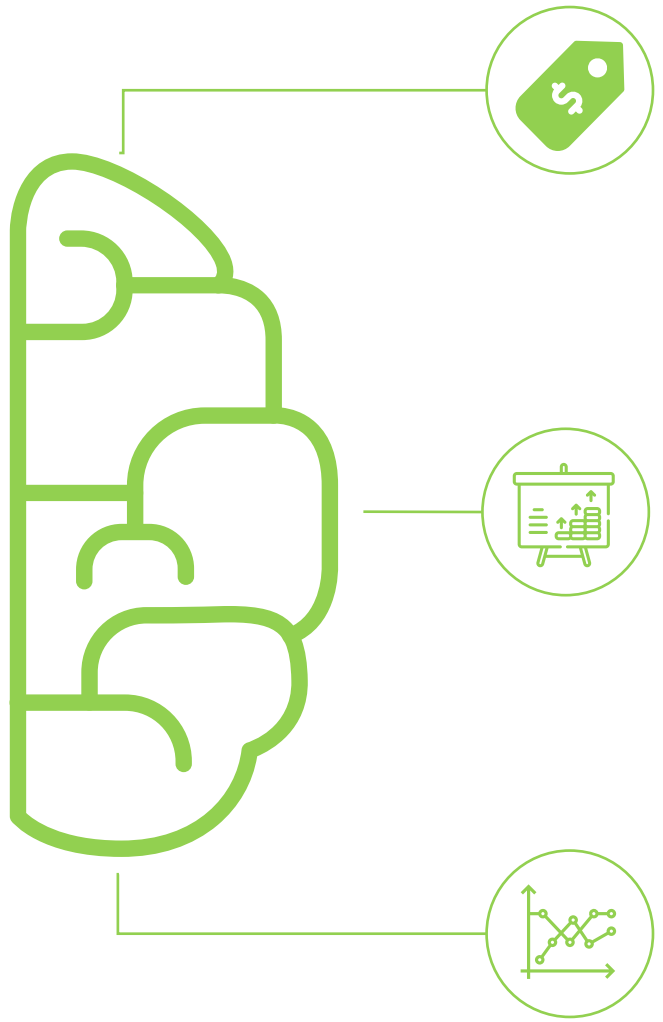
HOW TO COMPARE?

Conclusion

- Not fitting for our project

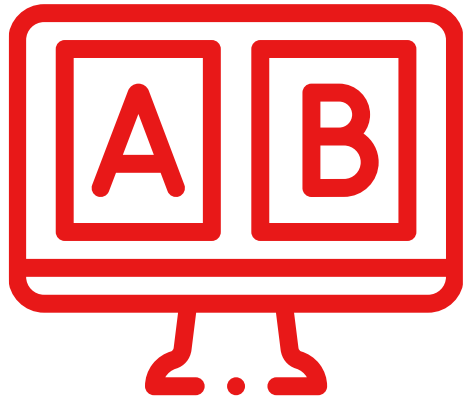


On cloud solution



Introduction

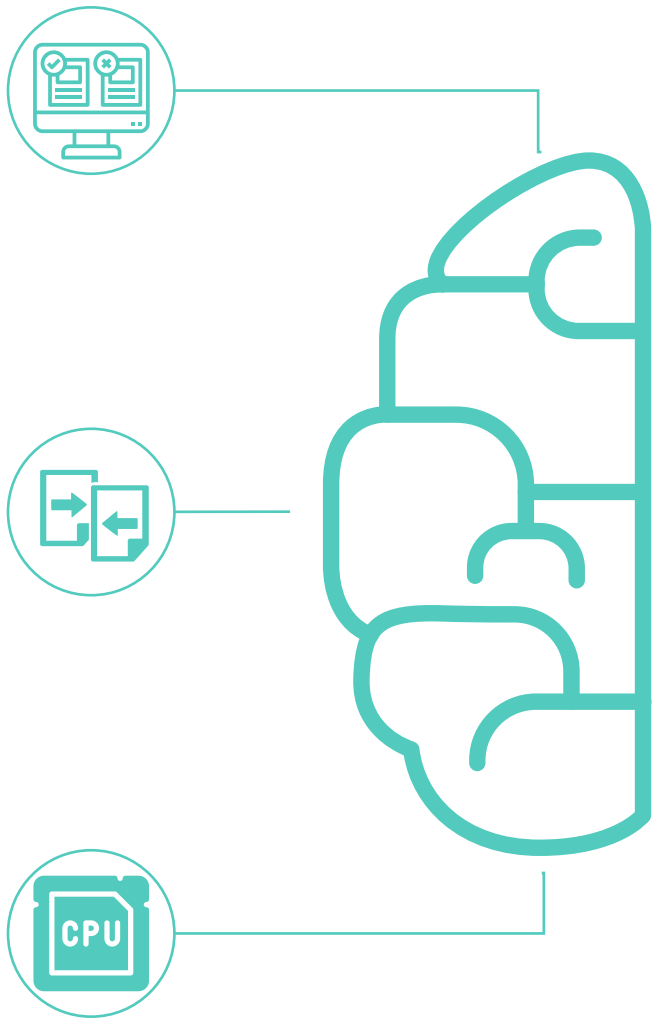
On cloud



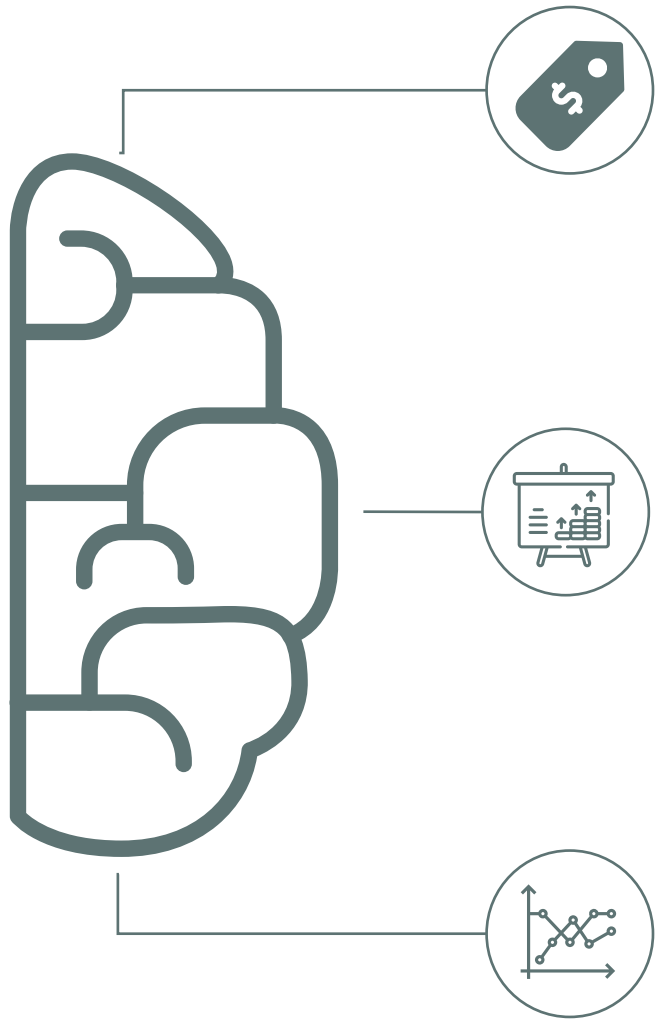
How to compare?

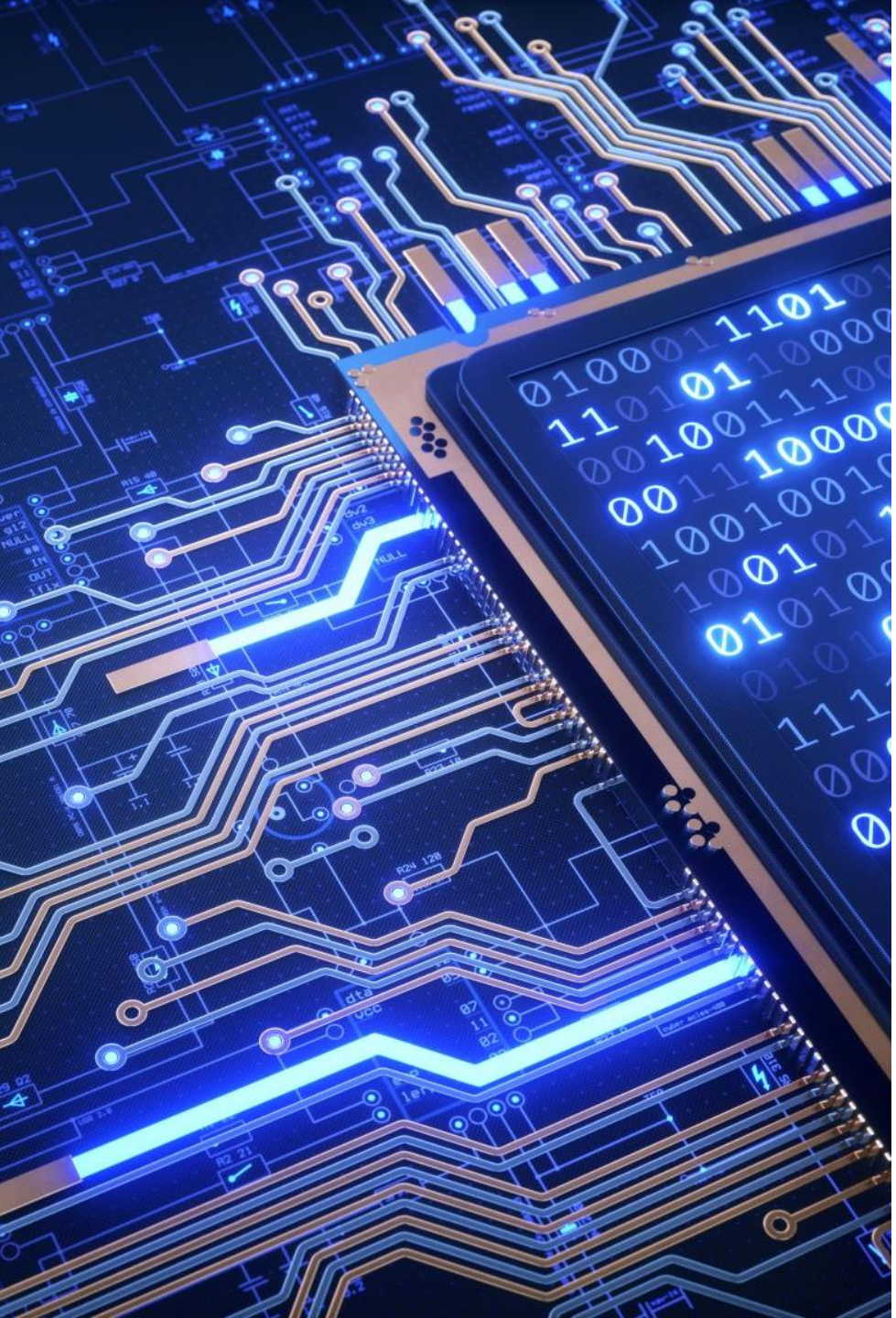
Conclusion

- Azure
- Security features
- User Friendly
- Experience



Number plate recognition: Camera





Introduction

- Hardware
  - Resolution
  - Low lighting
  - Weather proof
  - Robust design

- Software
  - Additional software
  - ANPR
    - Automatic Number Plate Recognition

Conclusion

- Hikvision DS-2CD7A26G0
  - 1920 x 1080 (60fps)
  - IP67
  - ANPR
  - Night vision
  - Robust
  - Price: €905,08

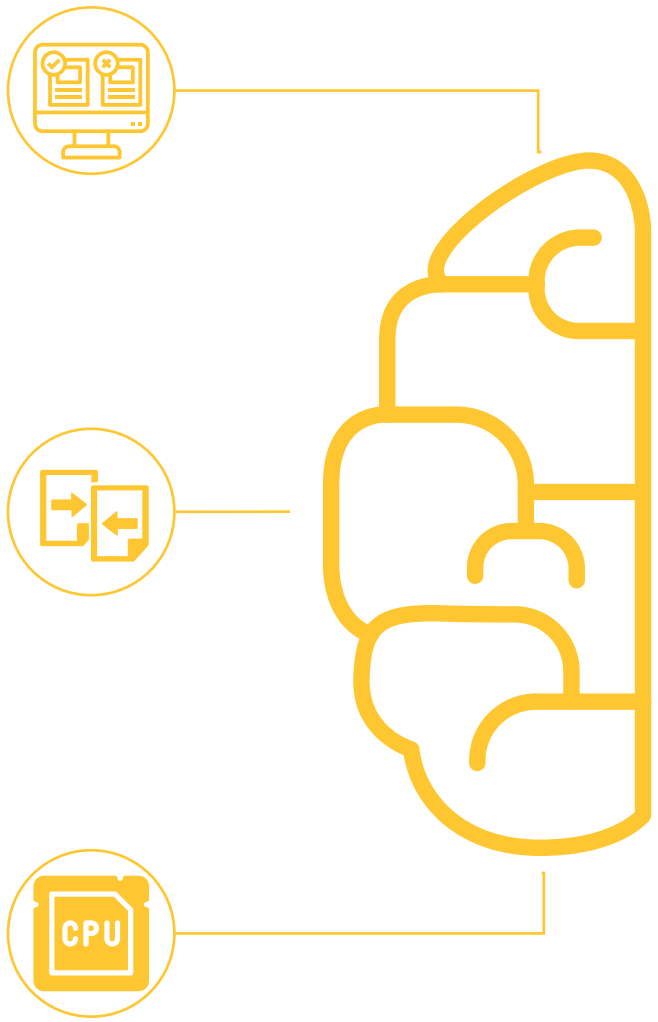
Number plate recognition: GDPR

Introduction

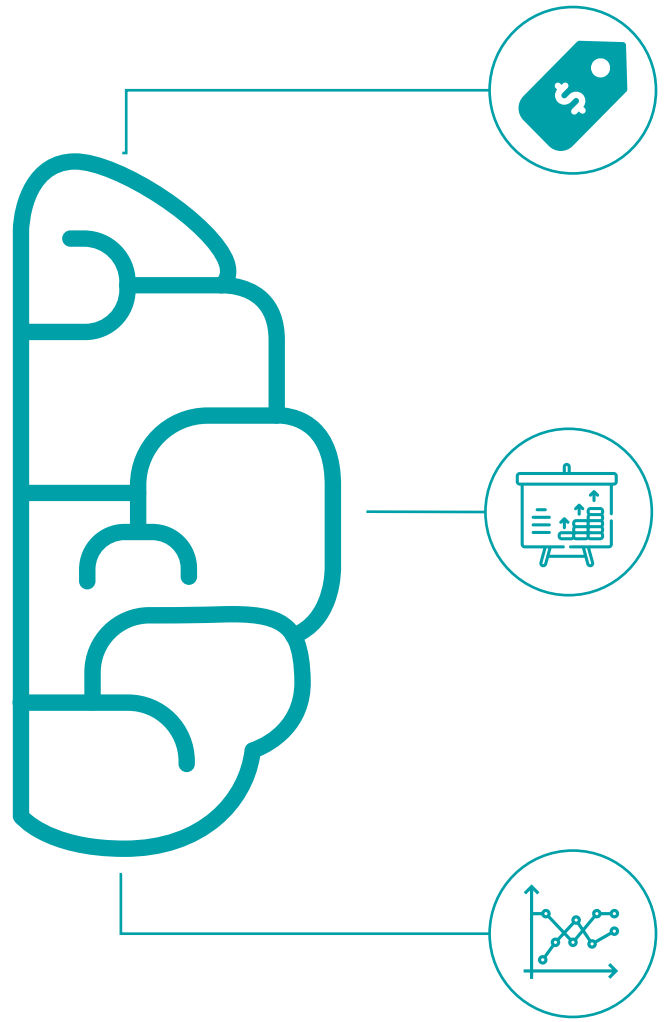
- General Data Protection Regulation
- Data protection and privacy

For our project

- Numberplates, video footage
- Kept safe
- Authorized access only



RFID tag



Introduction

Different chips

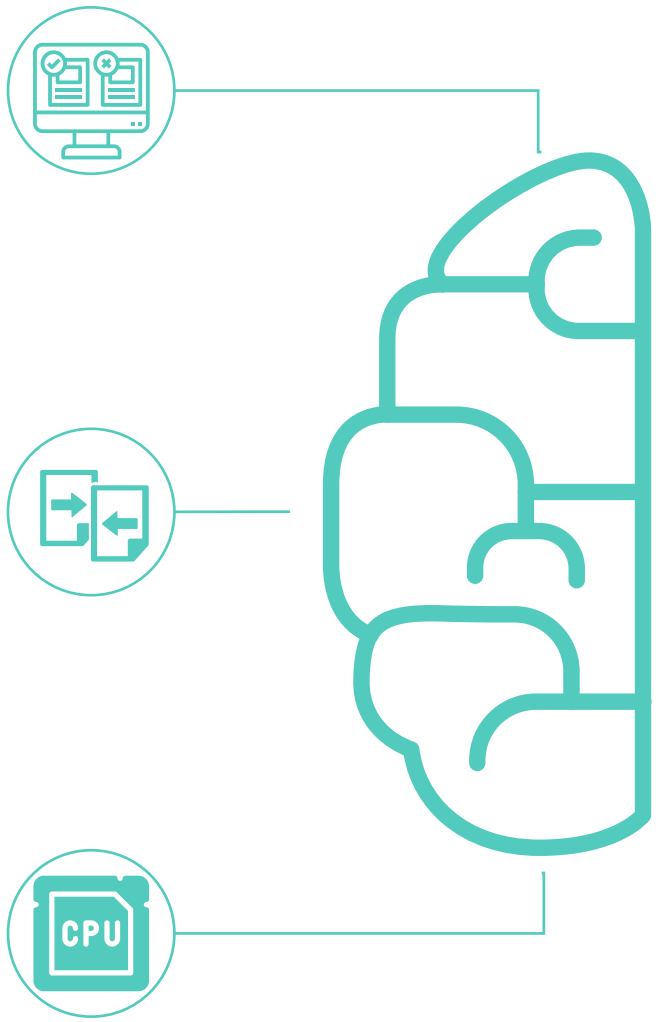
- Active
- Semi-active/Semi-passive
- Passive

Frequencies

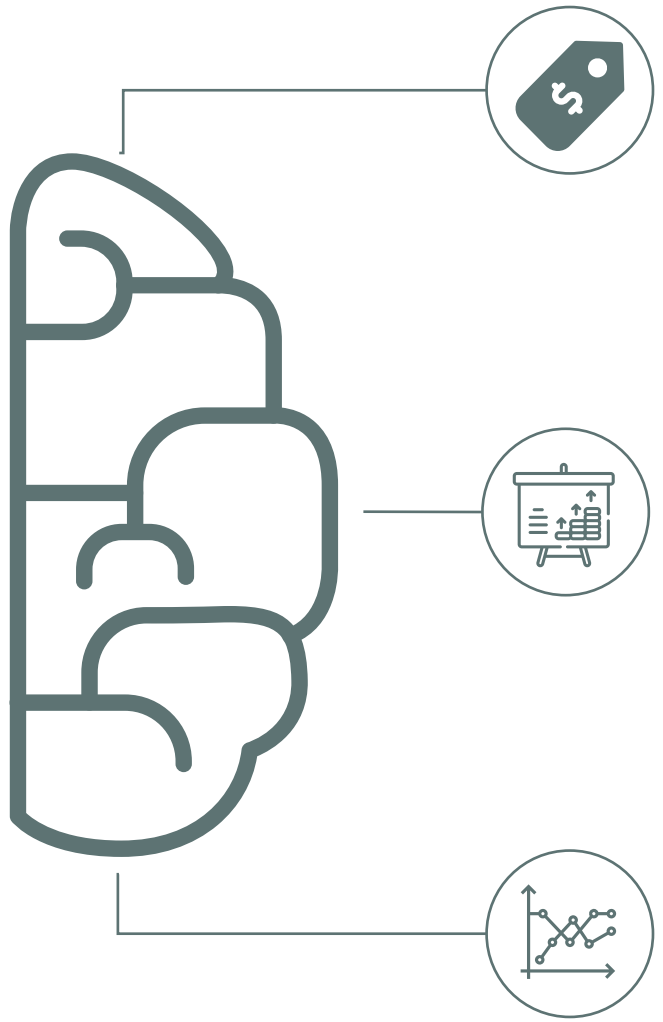
- Low-Frequency (LF)
- High-Frequency (HF)
- Ultra High Frequency (UHF)

Conclusion

- Confidex Carrier Tough ||
  - Ultra High Frequency
  - IP67
  - Until 12m
  - €50 / 10 pieces



RFID reader



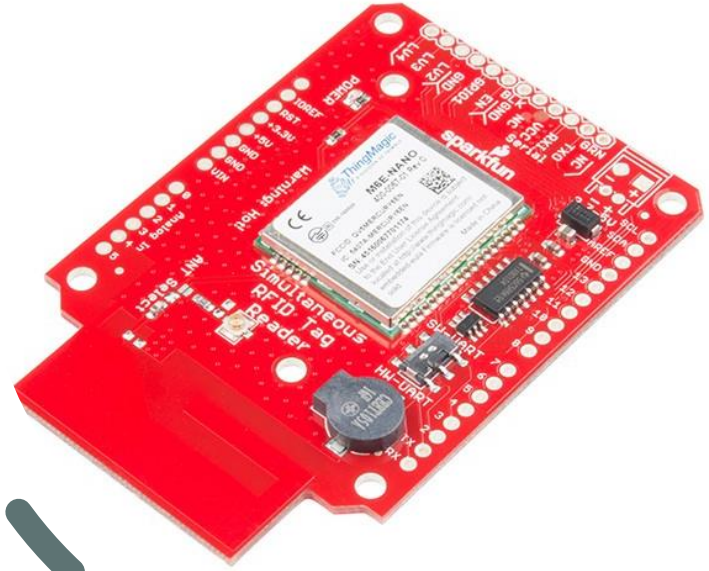
Introduction

- Ultra High Frequency band
  - 868-928 MHz
- Range
- Compatibility
- Location

Conclusion

- M6E Nano Reader
  - Reads multiple tags simultaneously
  - Same protocol: EPCglobal Gen 2
  - Compatible with PC or Arduino
  - Disadvantage
    - Reading range > 60cm
    - No water resistance
  - Price: €241,94

- Additional Antenna
  - Reading range > 5m
  - Same connector
  - Price: €48,34



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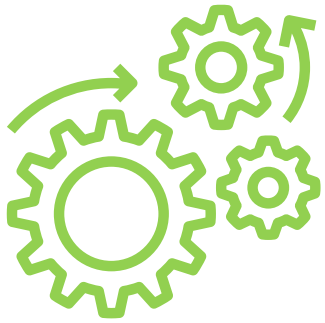
Full Conclusion



Automation

Number plate recognition

- Hikvision DS-2CD7A26G0

RFID

- Confidex Carrier Tough ||
- M6E Nano Reader with an additional antenna

Monitoring

Framework

- Server-side
- Laravel

Data-storage

- On cloud
- Azure

Visualization

- Power BI

Thanks!

Any questions?