Industrial IoT: Improving manufacturing processes
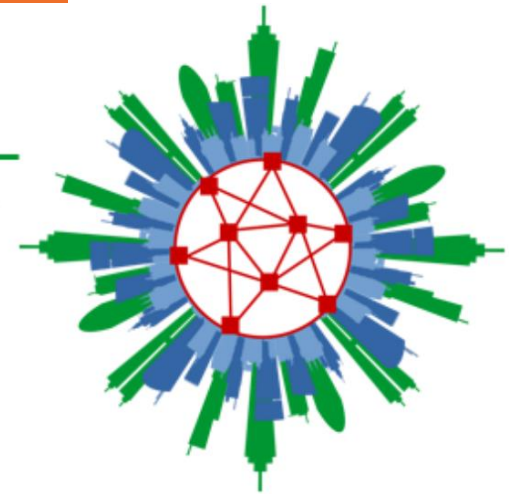
SuMoCoS

Sustainability and Mobility in the Context of Smart Cities
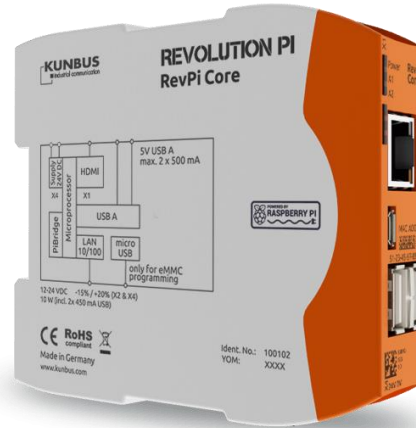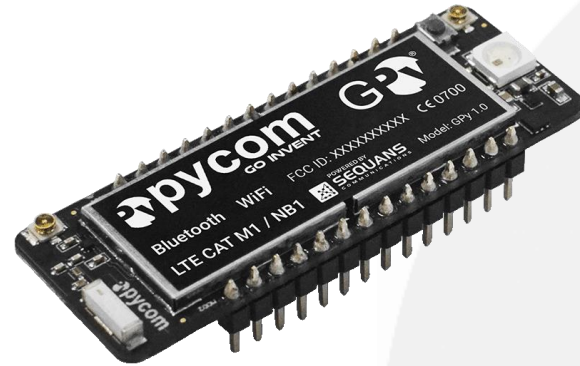
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About erminas

- Industrial IoT Solutions and Enterprise Applications

- Founded 2009

- Located in Oldenburg (Germany)

- 25 employees

- Customers in Europe, North America, and Asia

- Fields

  - Consulting

  - Prototyping

  - Development

  - Applied Research

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What is Industrial IoT?

- IoT: „Extension of network connectivity and computing capability to objects, devices, sensors, and items not ordinarily considered to be computers" (Internet Society, The Internet of Things (IoT): An Overview, 2015, https://www.internetsociety.org/resources/doc/2015/iot-overview)

- Industrial IoT:

  - IoT in industrial environment

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Technologies of Industrial IoT

LoRa

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Technologies of Industrial IoT

Azure

aws

Alibaba Cloud

SAP Cloud Platform

Edge
Computing
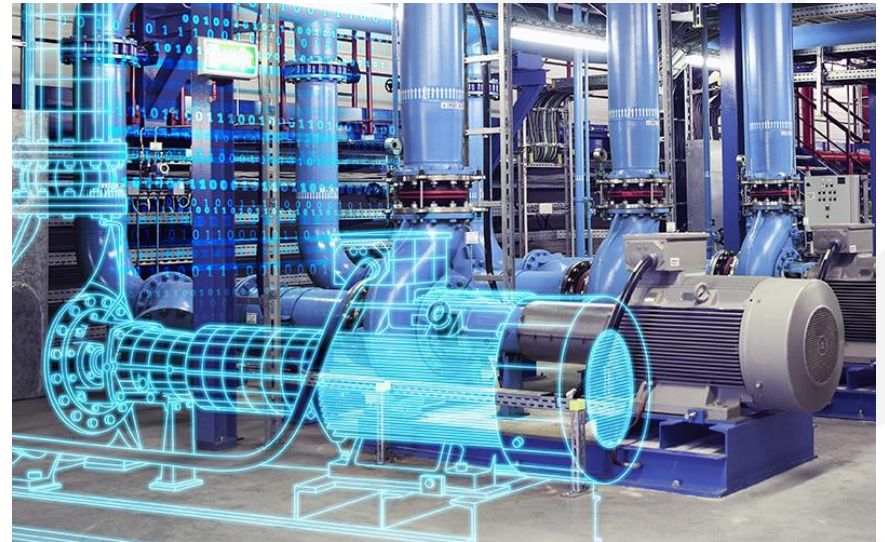
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Benefits of Industrial IoT

- Digital Twin: Digital replica of physical entity

    - Simulation

    - Reproducing

    - Optimize

- Resource-optimized production

- Control of machines off-site

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Benefits of Industrial IoT

- Pay-per-use charge

  - Example: Rolls Royce turbines „Power-by-the-hour"

- Changing social environment

  - Elderly people

  - More specialized / Less specialized

  - Job-changing
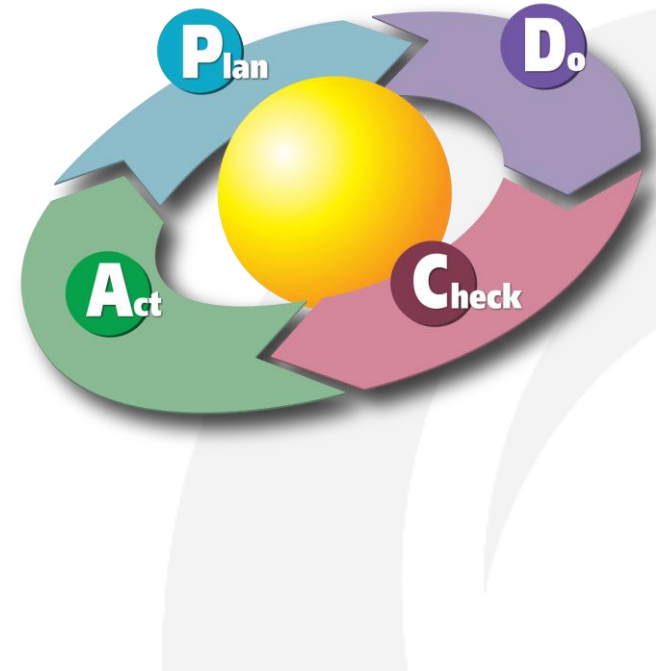

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How does an IIoT project work like?

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Types of projects

- Green-field approach

- Retrofitting existing machines

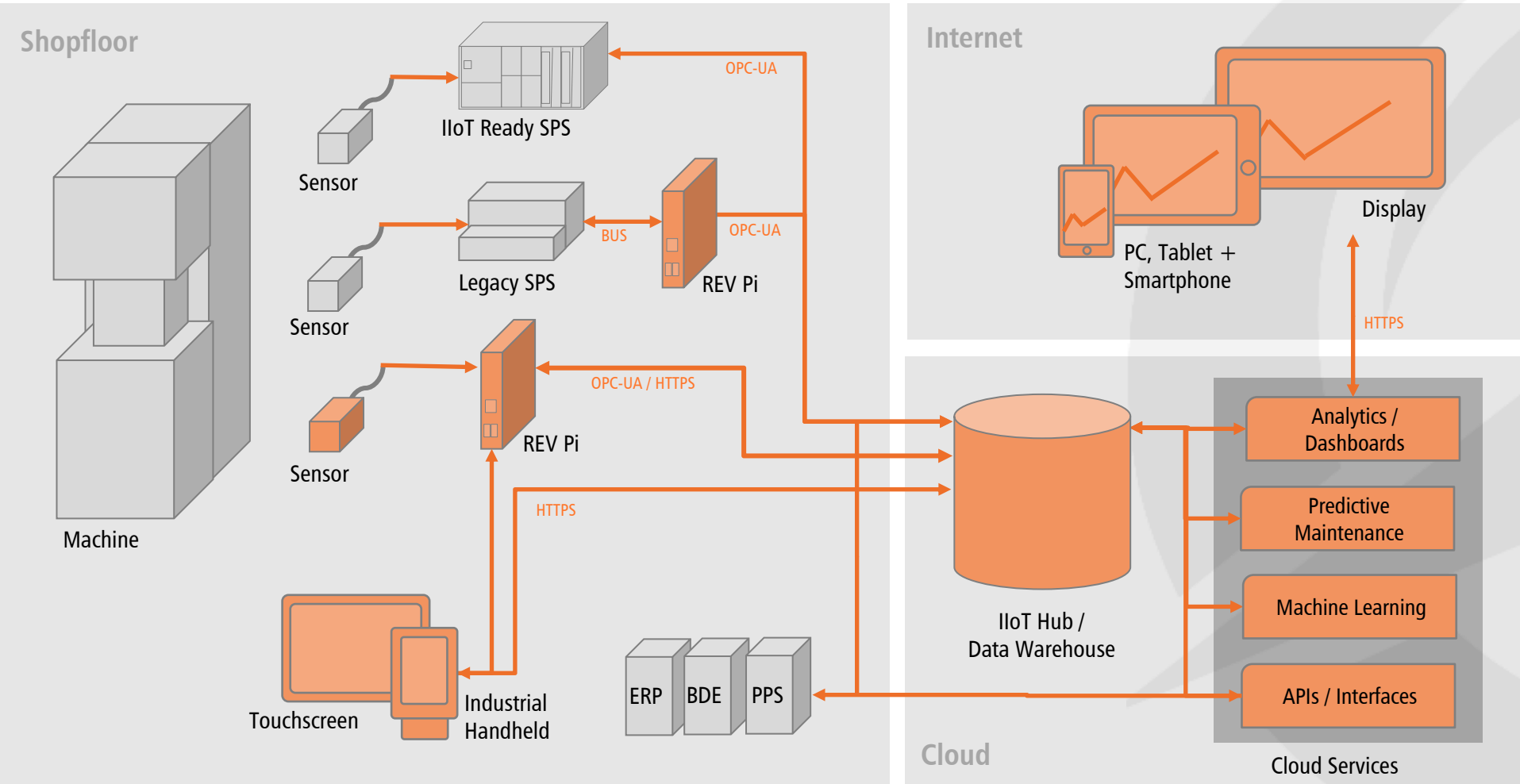- Parallel development (e.g. via CV)

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Steps

1. Understanding requirements of business

2. Talking to involved people / stakeholder

3. Create possible solution with customer

4. Build and evaluate prototype

5. Build solution

6. Enhance solution (repeat all steps above)

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Retrofitting

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Cost-efficient Retrofitting

Shopfloor

Machine

Sensor

IIoT Ready SPS

Sensor

Legacy SPS — BUS — REV Pi

OPC-UA

Sensor

REV Pi

OPC-UA / HTTPS

HTTPS

Touchscreen

Industrial Handheld

ERP | BDE | PPS

Internet

Display

PC, Tablet + Smartphone

HTTPS

Cloud

IIoT Hub / Data Warehouse

Cloud Services

Analytics / Dashboards

Predictive Maintenance

Machine Learning

APIs / Interfaces

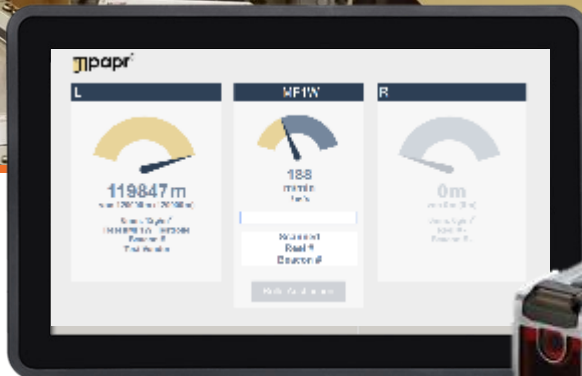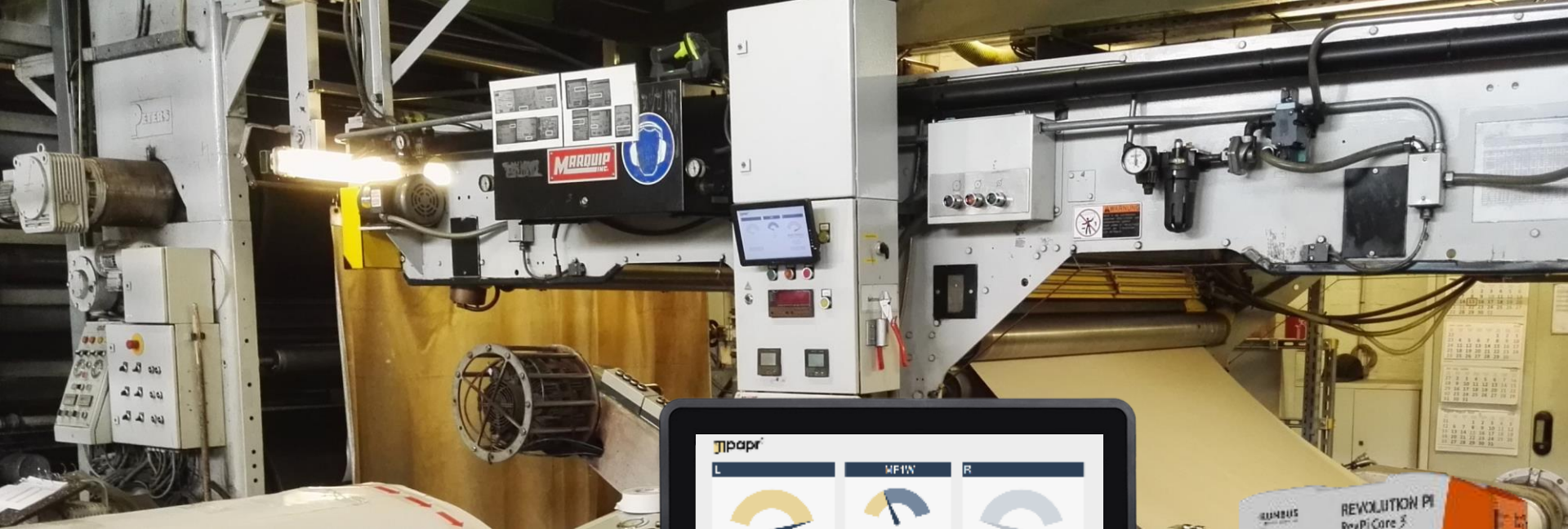**erminas**

existing   new

Real World Examples

SmartTransport

SmartProduction
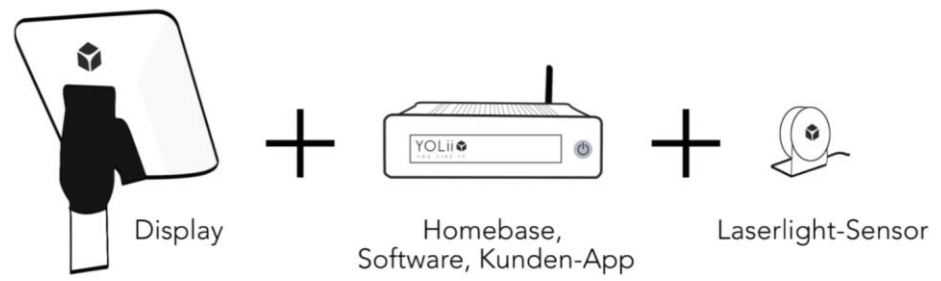
SmartEnergy

SmartAgriculture

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Train Water Supply

- Prevent water usage by unauthorized people
- Control machines off-site

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- Real-time inventory in paper industry (e.g. corrugated board)

- Planning of production processes and optimize stock

- Identify paper reels by Bluetooth beacons

- Independent Retrofitting solution

- Edge computing without required Cloud

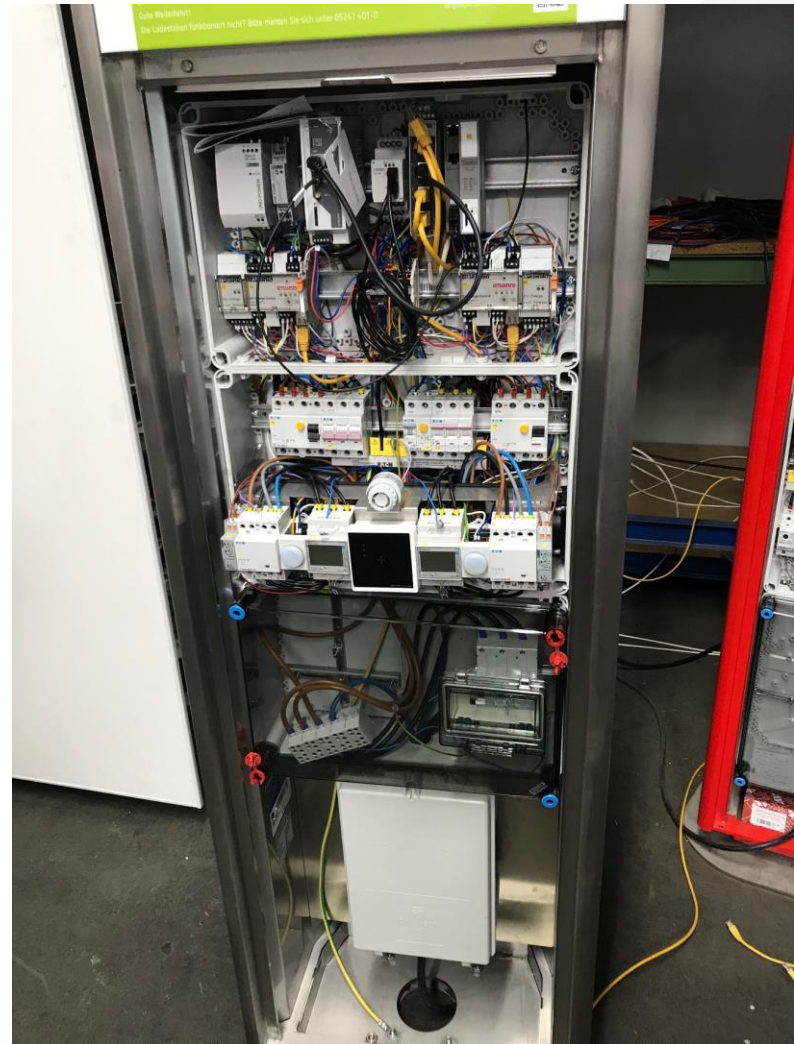Display + Homebase, Software, Kunden-App + Laserlight-Sensor

- Retrofitting as a custom product development project (Physical Therapy)
- IoT Strategy
- IoT Hard- and Software Development
- Global production of custom hardware
- More than 100 customers within DACH region

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Electric vehicle charging

Improving charging points

by integrating into Smart Grid

Make better use of renewable energies

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Machine Learning

Identify and predict electrical shorts at furnaces

Hydroponics – Smart Greenhouse (Research)

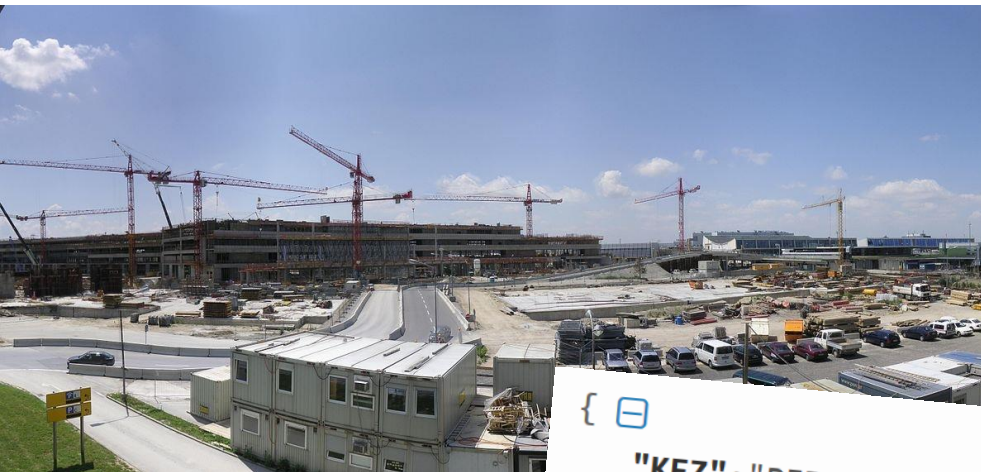Improve growing plants in controlled environment

(independent of vegetation period)

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Tracking of Suppliers (Research)

Identify deliveries at construction areas

via camera identification, scales, and machine vision

```
{
  "KFZ":"PIR-TS-290",
  "Vehicle type":"Truck",
  "Vehicle subtype":"Dump-truck",
  "Owner":"Humboldt Gmbh & Co. KG",
  "Date":"2018-08-23",
  "Timestamp":1534975200000
}
```

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Thank you!
Баярлалаа!

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