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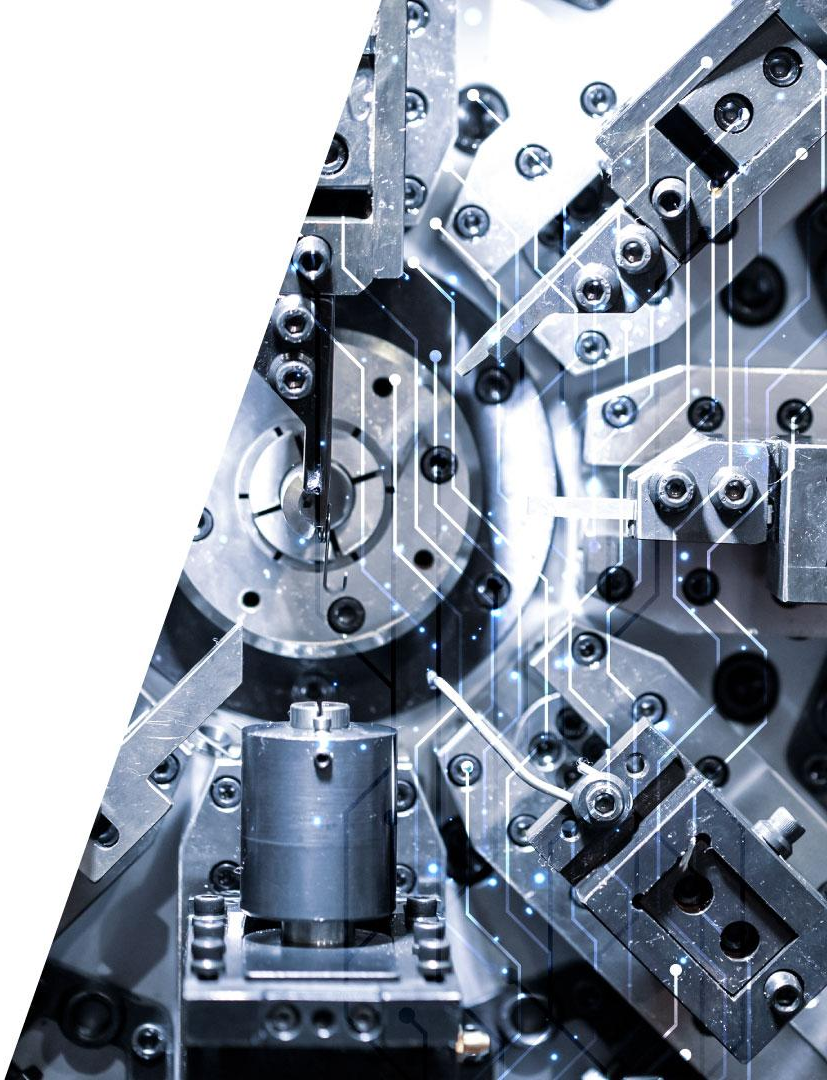
Software solutions from the edge to intelligence.



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AIknow designs and implements complete software solutions, from edge to artificial intelligence.

We deal with data collection and analysis, from the device in the field to the cloud, applying artificial intelligence algorithms to improve processes, products and facilitate strategic decisions.

We work with a concrete, results-oriented approach, ensuring precise deadlines, clear costs and effective solutions designed to integrate quickly into our customers' real-world contexts.

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From Edge To Intelligence

Software solutions for data acquisition and analysis with artificial intelligence

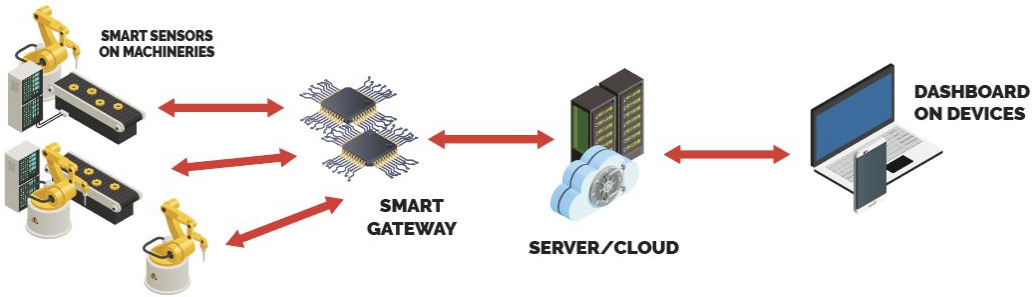
#HumanDrivenTechnologyBased #FullSwHouse #EmbeddedKnowHow #MalagaSpainTechPark

How does it work?

Data Collection
This is done via hardware devices in the machine or via common gateways and sensors for revamped applications.

In both cases, the AIknow software solution finds perfect application through the installation of its own framework that enables data collection by sending it to the cloud platform.

Data analysis and monitoring
Data collected at the edge can be analysed with machine learning and artificial intelligence algorithms and visualised through customised dashboards. Customer identity and AIknow technology form a perfect combination of innovation and integration.



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EDGE: intelligent data collection and processing

From sensors to artificial intelligence applied to the edge

We design and develop embedded firmware for microcontrollers to acquire and process data directly from sensors in the field.

On edge and gateway devices, we implement software capable of executing local algorithms to reduce latency, optimise power consumption and ensure fast and reliable system response.

All operations are securely managed in full compliance with CRA (Cyber Resilience Act) principles and support for remote firmware and software updates through secure OTA (Over-the-Air) mechanisms.

Software Development for Industrial Machine Interface

Edge Data Processing

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CLOUD & APP: scalable data management and monitoring

From the edge to the cloud

The collected data is securely transmitted to the cloud, where it is aggregated, processed, including using AI, and visualised through customisable dashboards and monitoring tools.

We offer cloud platforms tailored to project needs, with APIs and interfaces for integration, as well as mobile applications (APPs) for accessing real-time data, alerts and remote system control.

Scalability, reliability and ease of use are the cornerstones of our approach to the cloud.

Web/Edge Application Containerization

Frontend and Mobile Applications

Cloud Platforms

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AI: turning data into strategic information

Artificial intelligence from the edge to the cloud

We apply artificial intelligence models both at the edge and in the cloud to transform raw data into meaningful insights.

Our artificial intelligence algorithms help make intelligent decisions by identifying patterns, predicting behaviour and enabling automation in various application areas, from industry and energy to intelligent environments and logistics.

The goal: to extract value from data to improve processes, efficiency and results.

Edge data processing

NXP · NVIDIA · yocto PROJECT · Linux

AI computer vision

ultralytics YOLO11 · OpenCV

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USE CASE

Company producing and selling worldwide industrial voltage stabilisers

NEED

Improve customer service, centralise information on product performance, monitor the correct use of the product by customers.

OPERATIONAL CONTEXT

Devices for stabilising the electrical network supplying industrial production machinery.

SOLUTION PROVIDED BY AIKNOW

Design and development of the entire platform customised to the customer's specific needs, specifically:

- Selection and supply of electronic sensor devices and data centralisation gateways.
- Design and development of the gateway application for collecting and monitoring data and alarm logic in EDGE devices.
- Cloud application design and development.
- Design and development of system control application and OTA software updates.
- Creation and management of cloud infrastructure on Amazon AWS.

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USE CASE

Company working nationwide in the field of RADIO TELECOMMUNICATIONS FOR PUBLIC ADMINISTRATION

NEED
Avoids telecommunications network blackouts over a wide area.

OPERATIONAL CONTEXT
Telecommunication signal transceiver columns for 100,000 radio units with main power supply from national grid and backup power supply from battery pack.

SOLUTION PROVIDED BY AIKNOW
Since the battery is the critical element that intervenes in the event of a blackout to give continuity to the telecommunications service, a surveillance system was set up to verify the full functionality of the batteries.

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USE CASE

Company producing global production lines

NEED
Collect telemetry data generated by mechanical and electronic devices to monitor performance and prevent failures.

OPERATIONAL CONTEXT
Switches with gas compartments and motors for opening and closing high-voltage lines.

SOLUTION PROVIDED BY AIKNOW
Design and development of software on board the gateways to centralise data from the devices and send the collected and analysed data to the customer's BI (business intelligence) platform.

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USE CASE

Global manufacturing company for healthcare systems and not for smart cities.

NEED
Ensure the availability of AED life-saving devices distributed throughout the country.

OPERATIONAL CONTEXT
Display showcases containing untampered AEDs (devices are stored inside the showcase and are accessible in case of need through a glass cover).

SOLUTION PROVIDED BY AIKNOW
The showcase, already equipped with the necessary sensors, was connected to the AIknow monitoring platform, which displays the location of the device with a clear indication of the status of integrity and availability in a simple and intuitive map view.

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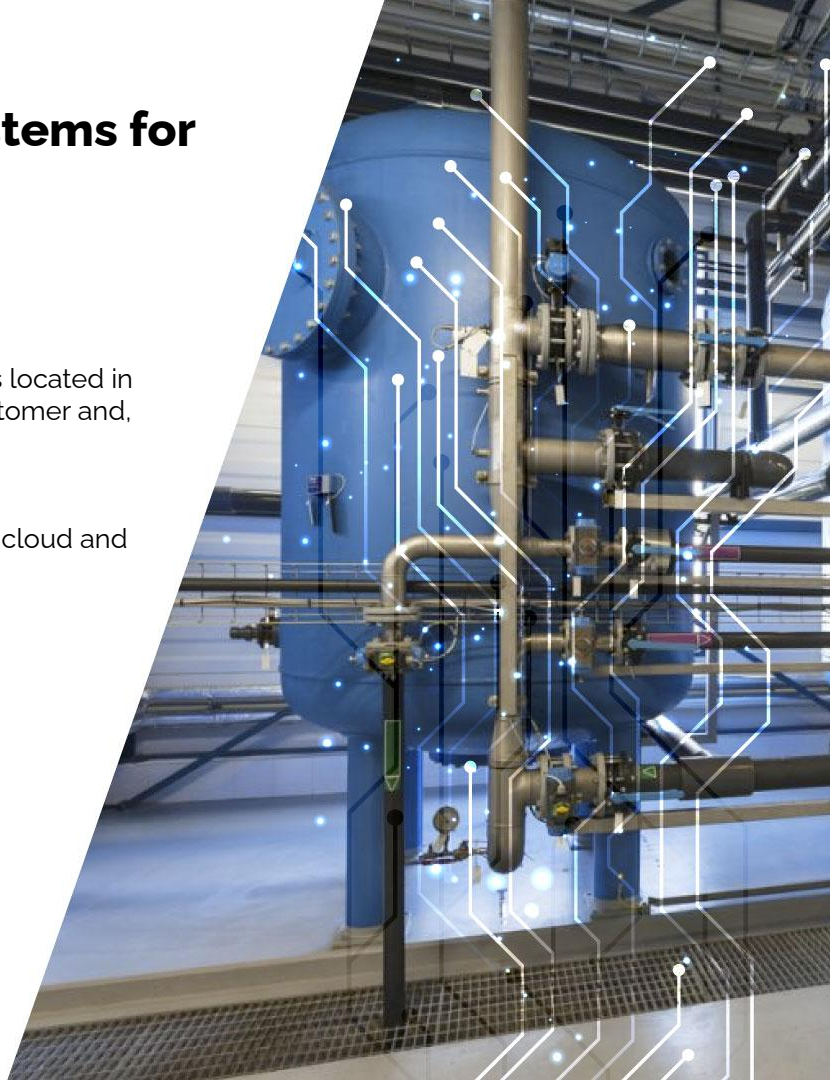
USE CASE

Company producing worldwide filtration systems for air and water

NEED
Digital transformation of the business model.

OPERATIONAL CONTEXT
The customer's product is a component that has to be replaced periodically and is located in filtration plants of companies that do not have a business relationship with the customer and, therefore, also use spare parts from other suppliers.

SOLUTION PROVIDED BY AIKNOW
We installed sensors on the customer's products that now send usage data to the cloud and set up a monitoring system.



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USE CASE

Company performing nationwide processing of steel coils.

NEED

Digital transformation of the goods receipt process by detecting the quality and possible defects of each reel.

OPERATIONAL CONTEXT

Steel coils of several tonnes of varying weight, thickness and width are received, analysed and processed inside acid tanks. The goods arrive in trucks carrying one to six coils each.

SOLUTION PROVIDED BY AIKNOW

Design and development of an Android application to replace the old Windows CE terminals for collecting information from each reel;

Design of a web application for consulting the data collected and integration with the company's management systems, specifically:

- Integration with the incoming and outgoing vehicle weighing system.
- Integration with the dynamometric scale of the coil unloading crane.
- Integration with the IBM AS400 company management system for retrieving goods and customer data, writing down the information collected.
- Taking photographs of the coils during unloading and sending them to the company document system.
- Integration with the RTLS tracking system of coils in the company's warehouse.
- On-premise installation within the customer's company infrastructure.

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USE CASE

MES for a global manufacturing company consumer/lifestyle products

NEED

Visualise production and quality data and alarms from all production line work centres in real time and in a centralised manner, generate notifications and alarms, support decision-making processes through dynamic aggregations and groupings of different semi-finished and finished products.

OPERATIONAL CONTEXT

Heating blanket production line, from the first production stages of the heating element to the testing of the finished product.

SOLUTION PROVIDED BY AIKNOW

Design and development of a Manufacturing Execution System (MES) customised to the customer's needs and the peculiarities of the production line, specifically:

- Collection of production, quality and alarm data from all the different work centres.
- Aggregation and presentation of data in a single monitoring dashboard.
- Ability to calculate derived metrics at runtime using high-performance calculation engines
- Application of machine learning techniques to obtain forecasts of production volumes and possible failures.

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USE CASE

Company producing and installing signage monitors digital signage monitors for the transport sector worldwide.

NEED

Centrally manage a fleet of monitors and devices, assigning them hierarchically to clients, networks and locations; monitor parameters and telemetry in real time, assign the on-screen display of a web page or screensaver, remotely control monitor hardware elements (fans, heaters, backlight).

OPERATIONAL CONTEXT

Production and installation of information monitors for railway and bus stations, window monitors and interactive kiosks.

SOLUTION PROVIDED BY AIKNOW

AIknow developed a cloud platform able to survey the devices, collect and display the telemetry sent and send commands to modify the behaviour of the monitor. In addition, it realised the Linux image of the board on board the monitor, as well as the application layer to manage the displayed content and the device itself, using Yocto.

Thanks to the high configurability of the solution, the customer can remotely modify the contents displayed on the monitor, the management of the screensaver and lighting with a view to 'saving energy', as well as the cooling and heating modes of the device according to temperature.

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USE CASE

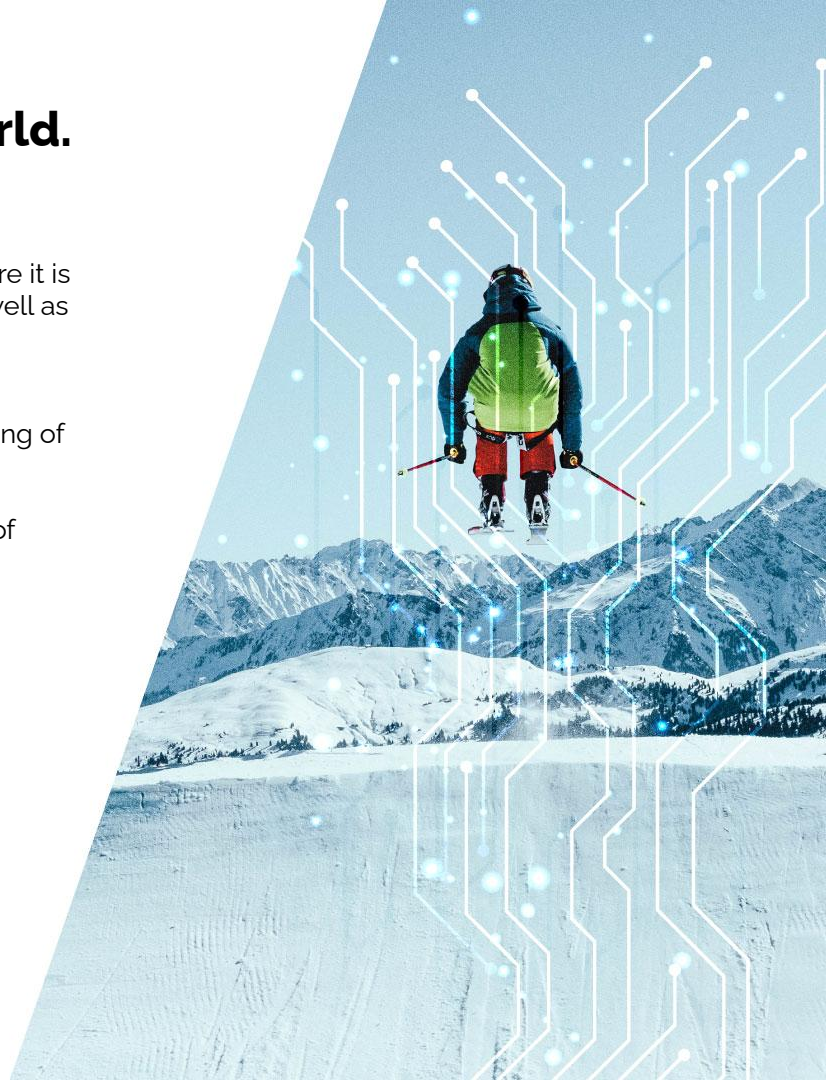
Ski equipment company sold all over the world.

NEED

Creation of the proof of concept (PdC) to monitor the company's rental points, where it is necessary to control the entry and exit of the rented material (skis, boots, etc.), as well as the parameters that define the use of the products, such as, in the case of skis, acceleration and torque values.

Implementation of an ad-hoc platform for the visualisation, extraction and processing of data received from both rental points and rented objects.

Identification of objects via radio and NFC antennas, detection of entry/exit doors of rental points.



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USE CASE

Firmware for a global manufacturing company common consumer/lifestyle products

NEED

Firmware development with assembly language for consumer electronics products. Development of safety software according to IEC 60335 (equipment).

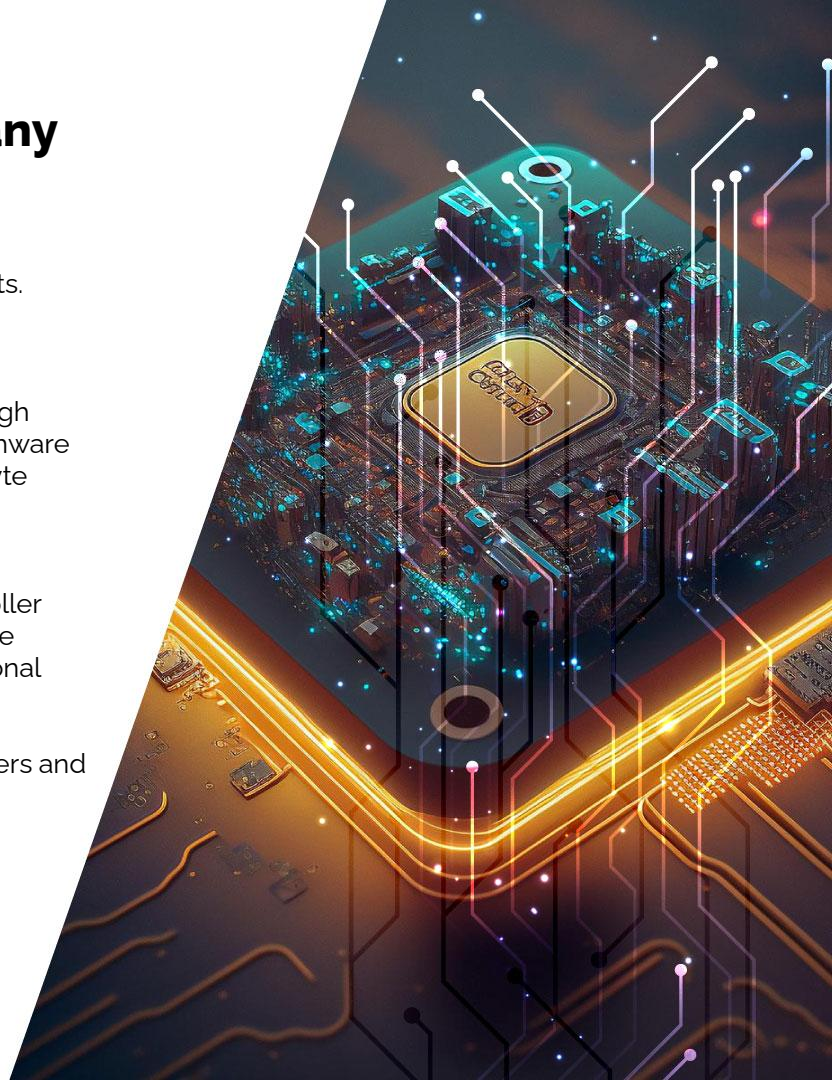
OPERATIONAL CONTEXT

Development production is governed by a *design-to-cost* approach, given the high volume of parts produced each year. For this reason, it is necessary to develop firmware on microcontrollers of extremely low capacity and performance (8-bit ALU, 256 Byte RAM, 8KByte ROM) to save as much as possible in the volume of parts produced.

SOLUTION PROVIDED BY AIKNOW

AIknow is able to quickly learn the functioning and peculiarities of the microcontroller selected by the customer, according to specific requirements, to design and realise firmware implemented with low-level languages (Assembly, C) both from a functional and safety point of view.

For this specific use case, AIknow realised safety functions for the control of registers and components of the microcontroller.



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USE CASE

Application of computer vision models using artificial intelligence

In manufacturing, ensuring product quality is essential to reduce waste and improve production efficiency. However, traditional manual visual inspection methods are slow, prone to human error and difficult to scale.

OPERATIONAL CONTEXT

In industrial processes, operators must detect product defects through visual inspection, often with the aid of measuring instruments. This approach presents several critical problems:

- Limited reliability, due to the subjectivity of manual inspection.
- High expenditure of time and resources, which slows down production.
- Difficulty in handling large volumes of visual data, which complicates quality standardisation.

SOLUTION PROVIDED BY AIKNOW

AIknow has developed a system based on machine vision and deep learning models, in particular convolutional neural networks (CNN) and advanced architectures such as ResNet and YOLO, to automate quality control.
The application allows:

- Identify and classify defects in real time through image analysis.
- Provides automatic alerts to reduce human intervention in inspection processes.
- Integrates with company systems, enabling constant and optimised monitoring.

RESULTS

- Higher accuracy in defect detection compared to manual methods.
- Reduced inspection time and increased production efficiency.
- Scalability of the system, adaptable to different industrial processes.

Thanks to artificial intelligence and machine vision, AIknow offers innovative solutions to improve the quality and automation of production processes.

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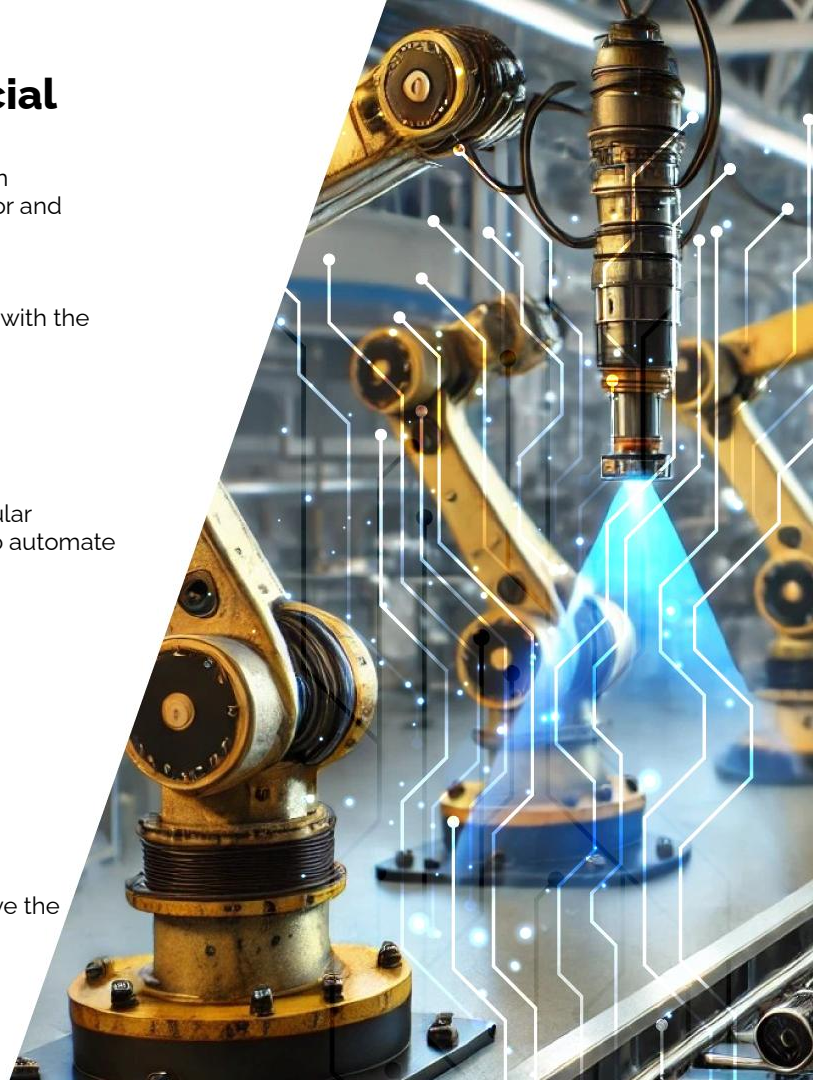

USE CASE

Implementation of WMS solutions with GPS geolocation functions

NEED

The objective is to create an Android application for overhead crane operators, which can guide them through the different activities of collecting, depositing and transferring UDCs (Load Units) in the warehouse.

OPERATIONAL CONTEXT

Overhead crane operators are responsible for moving UDCs from one area to another. In order to know where to go, they follow the directions of another operator and ground handler who guides them to the different destinations they need to reach. Currently, the crane operator has no information about the products to be moved, their location and where they need to go, but must rely entirely on the ground operator.

SOLUTION PROVIDED BY AIKNOW

Design and development of an Android application to display the truck driver's assigned task and track his GPS location.
Specifically, the application:

- Shows the operator all the information related to the Load Unit he has to work with
- Shows the structure of the warehouse
- Shows your GPS position in real time on the warehouse map
- Integrates with the WMS W-Cube for order management
- Shows the destination you need to reach, with direction and distance information
- Shows task updates in real time

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