THE QUALITY CONNECTION

FACTORY AUTOMATION

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DEFINITION ISSUES & ADVANTAGES



Definition:

Factory automation means the use of technologies to control and manage production processes without direct human intervention.

This includes systems such as robots, sensors, control software and other technologies that improve the efficiency and accuracy of industrial operations.

Issues:

1. Competitiveness : Companies need to automate in order to remain competitive on the global market.

2. Costs :

Production costs reduction in the long term, although initial investment may be high.

3. Quality : Quality product improved through more accurate processes.

4. Flexibility : Need to quickly adapt production lines to new market demands.

5. Labour : Management of the impact on employment and the need to re-train workers.





Advantages :

1. Increased efficiency : Machines can run 24 hours a day, 7 days a week without tiredness, increasing productivity.

2. Precision and quality : Human errors reduction and improvement of product consistency.

3. Security : Reducing risks to workers by keeping them away from hazardous work.

4. Lower costs : Although initial investment is high, long-term savings can be significant.

5. Innovation : Enables companies to innovate and develop new products faster.

> It is therefore a strategic lever for companies seeking to to optimize their processes and adapt to market changes.



Security

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APPLICATIONS TYPES

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Applications types : <u>Smart factory and Process automation</u>

Production management :

Systems that monitor and optimize production flows in real time, allowing operations to be adjusted to maximize efficiency.

Predictive maintenance : Applications that use sensors and data to predict equipment failures before they occur, reducing downtime.

Quality control :

Tools that analyze products in the process of manufacturing to ensure they meet quality standards, often using computer vision.

Energie management : Systems that monitor and optimize the plant's energy consumption, helping to reduce costs and carbon footprint.

Logistics and inventory management :

Applications that automate inventory management and logistics, ensuring better traceability and reduced errors.

Collaboration and communication :

Platforms that facilitate communication between teams, allowing for smooth information sharing and better coordination.

These applications help improve the accuracy, speed and efficiency of operations in a smart factory.









Applications types : Motion Control and Drives

Motion control :

Systems that manage the machines and robots movements, allowing precise positioning and synchronization of movements.

AC and DC drive systems: Applications that regulate the speed and torque of engines, thus optimizing equipment performance.

Robots automatisation :

Software that controls industrial robots for tasks such as assembly, palletising or handling, improving flexibility and productivity.

Speed and acceleration control:

Applications that dynamically adjust the speed and acceleration of machines according to production needs, ensuring optimal efficiency.

Feedback systems : Devices that provide real-time data on position and movement, allowing for instant adjustments to maintain accuracy.

Simulation and modelling :

Tools to simulate the movements and interactions of machines before they are implemented, helping to optimize processes and reduce errors.

These applications help make the plant more efficient, flexible and responsive to market needs





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Applications types : <u>Automation controls</u>

Process control systems :

These applications enable the monitoring and control of industrial processes in real time, ensuring that operations proceed as intended.

Machines automation :

Software that manages the operation of machines, automating specific tasks to improve efficiency and reduce human errors.

Supervision and data acquisition (SCADA) :

These systems collect and analyze data from various equipment, allowing for centralized monitoring and informed decision-making.

Quality control: Applications that automate product quality testing, using sensors and algorithms to detect anomalies.

Alarm management :

Systems that monitor equipment and send alerts in the event of failure or abnormal conditions, allowing for rapid response.

Internet of Things (IoT) integration:

Applications that connect devices and sensors to collect data and automate processes, improving responsiveness and efficiency.

These applications help optimize operations, improve security and reduce costs.









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Applications types : Industrial communication

Communication protocols :

Applications that use standardized protocols such as Modbus, Profibus or Ethernet/IP to enable communication between different devices and systems.

Supervision systems :

Software that centralizes data from various machines and sensors, allowing operators to monitor performance and analyze data in real time.

Data management applications :

Tools that collect, store and analyze industrial data, facilitating decision-making and process optimization.

Human-machine interfaces (HMI):

Applications that allow operators to interact with machines and systems, providing clear data visualization and intuitive controls.

Wireless communication :

Solutions that use wireless technologies (such as Wi-Fi or Bluetooth) to connect devices and sensors, offering more flexibility in installation and configuration.

IoT integration :

Applications that connect IoT devices to enable real-time communication and remote data collection, improving operational responsiveness and efficiency.

These applications play a crucial role in improving the productivity, safety and responsiveness of industrial systems















