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# Digital Transformation in Plantation Companies: Enhancing Efficiency, Safety, and Productivity

In one of the companies operating in the plantation sector in the Riau region, Indonesia, the focus is on managing oil palm and rubber plantations, as well as various other plantation commodities. Before the implementation of digitalization, the company faced several issues, including:

## 1. Absence of Digitalization at All Equipment Levels :

Before digitalization, each instrument display was not integrated with digital technology. This resulted in users being unable to obtain current and accurate information regarding the status of various ongoing processes in the field in real-time.

## 2. Conventional Measurement Methods :

The measurement techniques used were still traditional, meaning they were conducted manually without the aid of modern technology, which could reduce the efficiency and effectiveness of measurement accuracy.

## 3. Limited Data Visualization:

Information obtained from measurements was only visualized through existing electrical systems or programs without adequate data integration or processing. This made it difficult to comprehensively understand and analyze the data.

## 4. Distance and Dispersion of Measurement Locations :

Due to measurement locations being far apart and spread across various places, users found it challenging to perform regular checks. This situation demanded a solution that could facilitate monitoring without requiring physical presence at all times.

## 5. Manual Flare Monitoring :

The process of monitoring flares, which is a critical indicator of the emission of toxic and hazardous gases, was still done manually. This approach posed a high risk to worker safety and was also less effective in quickly detecting and addressing issues.

From the aforementioned issues, it is evident that there is an urgent need for digital transformation in the operations of the plantation company to enhance safety, efficiency, effectiveness, and data-driven decision-making accuracy.

## Solutions from Efortech

The solution adopted for this company involves implementing digital technology to address the operational challenges faced by the plantation company. This implementation consists of several key elements:

### 1. Use of Instrumentation Sensors:

Advanced sensors are installed at various critical locations to collect real-time data on operational conditions. These sensors can measure various parameters such as temperature, pressure, and humidity, which are crucial for monitoring the performance and safety of the plantation.

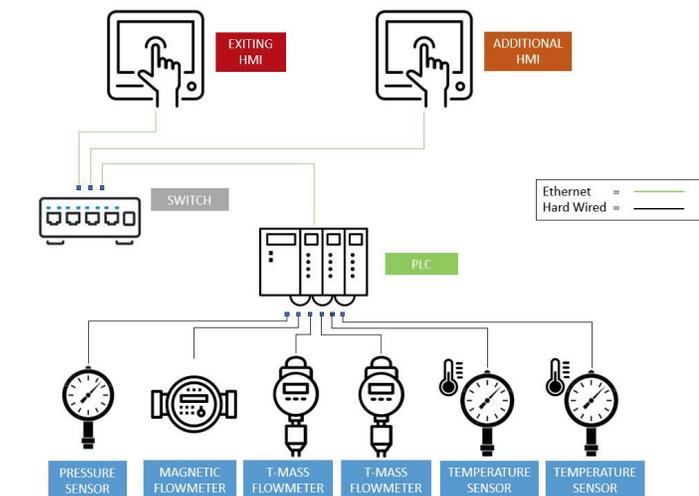
### 2. Local Monitoring through Human Machine Interface (HMI) :

A Human Machine Interface (HMI) is implemented as a control center to visualize processes and monitor the measurement results from the instrumentation sensors. The HMI provides an intuitive user interface, allowing operators to view and interpret data visually with ease. This assists in making quick, informed decisions about daily operations.

### 3. Digitalization for Flare System Monitoring :

With digitalization, the flare monitoring system has become more advanced. Information related to the flare system, which is essential for handling toxic gas emissions, can now be monitored in real-time. This implementation allows for early detection of potential issues or system failures, minimizing risks related to environmental and personnel safety.

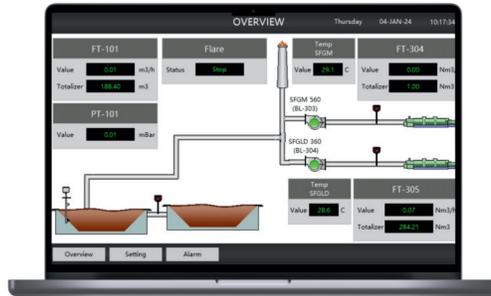
## System Diagram



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In this implementation, various instrumentation sensors such as Pressure, Flow, Temperature, and Flare status are integrated with Programmable Logic Control (PLC). The PLC acts as the system's brain, managing and processing data received from these sensors. Once the data is processed within the PLC, the results are then visualized through a Human Machine Interface (HMI). The HMI serves as the access point for operators or users to monitor and control the system directly.



## Benefits After Implementation

The implementation of instrumentation sensors integrated with PLC and visualized through HMI brings various significant benefits to this plantation company. Here are some of the benefits of this implementation:

### 1. Work Optimization

With real-time monitoring data, tasks can be better optimized. Users can take quick and precise actions based on up-to-date real-time information, thereby enhancing operational efficiency.

### 2. Efficiency and Effectiveness

The use of real-time monitoring systems allows for improved efficiency and effectiveness in both production processes and maintenance. Users can respond quickly to changing conditions, prevent production disruptions, and proactively plan maintenance.

### 3. Interactive Data Visualization

Data visualized through HMI can be accessed interactively for reporting to management. This enables management to monitor operational performance more effectively and make more accurate decisions.

### 4. Towards a Smart Factory

With all processes moving closer to automation, the concept of a smart factory is being realized. The system paves the way for the implementation of more advanced technologies in the future.

### 5. Risk Reduction and Workplace Accidents

The implementation of this technology helps reduce risks and workplace accidents by providing better field condition monitoring. Users can identify potential hazards more quickly and take appropriate preventive actions.

## Conclusion

The implementation of digitalization in the operations of plantation companies in Riau, Indonesia, can bring significant transformation in addressing existing challenges. The use of instrument sensors integrated with PLC and visualized through HMI brings various significant benefits such as enhancing security, efficiency, effectiveness, accurate data-driven decision-making, job optimization, and anticipating changes towards a Smart Factory.

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