



## Case Study

# Powering Smarter Manufacturing



### Domain

Manufacturing

### Challenges

- Lack of a master digital system
- Lack of real-time information
- Inefficient and costly paper-based production line

### Solution

Transform the factory via akaMES:

- Integrate equipment and machines with sensors, bar codes, QR codes, RFID (Radio Frequency Identification) to record data in real-time
- Develop a customized manufacturing execution system to monitor and manage collected data

### Benefits

- 90% of hard copies were replaced by e-document, overhead expenses decreased by 8%
- A bird's eye view and real-time visibility into the business operations for users



# Content

Abstract	3
The Painful Paper-based Production Line	4
Getting to the Core of Problems	5
A Bespoke Manufacturing System	6
Operation at Ease	7



# Abstract

As technology has played a growingly massive role in any aspect of life, more and more manufacturers are looking for IT solutions that can help them remain or achieve competitive advantages. Those who lag behind on the technology race may risk being out of the game permanently. How to streamline traditional, manual stages of the production line has long been the quest for many enterprises. This case study specifies the journey of a leading electronics manufacturer in leveraging digitalization to modernize and optimize its business performance.





# The Painful Paper-based Production Line

- The quality of information was not ensured
- Archiving proved to be a big hassle

Company S has been one of the largest multinational corporations in producing and assembling electronic parts and accessories for decades. With over 20 facilities in 6 countries around the world, the company designs and builds millions of items a year, making it one of the largest and most well-known electronic manufacturers in the global market.

Our client, the Asian branch of the company was maintaining a traditional production method in which workers perform sequential tasks along the assembly line. Record documents, or work orders, were filled in manually by employees each time a task was completed. With 3000 workers involved in the production line and more than 250 work orders needed to be stored per day, this paper-based system created significant challenges for factory managers.

- **First, the quality of information was not ensured** as mistakes and scratches normally happened, handwriting quickly became blurred and illegible after a short period of time. Updating information would require face to face synchronization from stakeholders, which was extremely time-consuming and labour intensive. The lack of real-time data also prevented adjustments or corrections from being conducted timely, especially in terms of the quality control and outgoing product inspection.
- **Second, archiving proved to be a big hassle.** As all work orders were in paper form, the company had to spend a significant amount on overhead expenses such as paper procurement and warehousing for storage, as well as allocating human resources to manage these assets and handle the paperwork.



When the efficiency and cost burden caused by the existing manual process was so massive that holding onto the traditional manner was no longer a viable option, the branch decided to seek for the consultancy from FPT Software, aiming to leverage technology to address the problem.

# Getting to the Core of Problems

- Lack of a master digital system
- Lack of real-time information
- Inefficient and costly paper-based production line

During the plant tour to understand the manufacturer’s workflow and business process, our team found out that issues associated with the paper-based method were the by-products of an obsolete production line. The core problem lay in **the lack of a master digital system** that could gather data from numerous sources, monitor all the production stages, and ensure synchronization of entities involved in the manufacturing process. The system should be able to cover all activities of the factory to ensure the highest efficiency, as well as easy to deploy, so that no major business interruptions would occur.

Due to the unique business requirements of the client and their budget constraint, our experts proposed **akaMES** – a versatile manufacturing IT system developed by FPT Software. The system integrates information on materials, resources, wastes, costs in one package, fully covering MES functions and part of ERP, PLM functions. It can help users to digitalize manufacturing activities, manage production operations in real time as well as track material issues. Especially, as it is highly customizable, akaMES can be easily tailored to specific business requirements, expected to resolve all the pain points the client was facing.

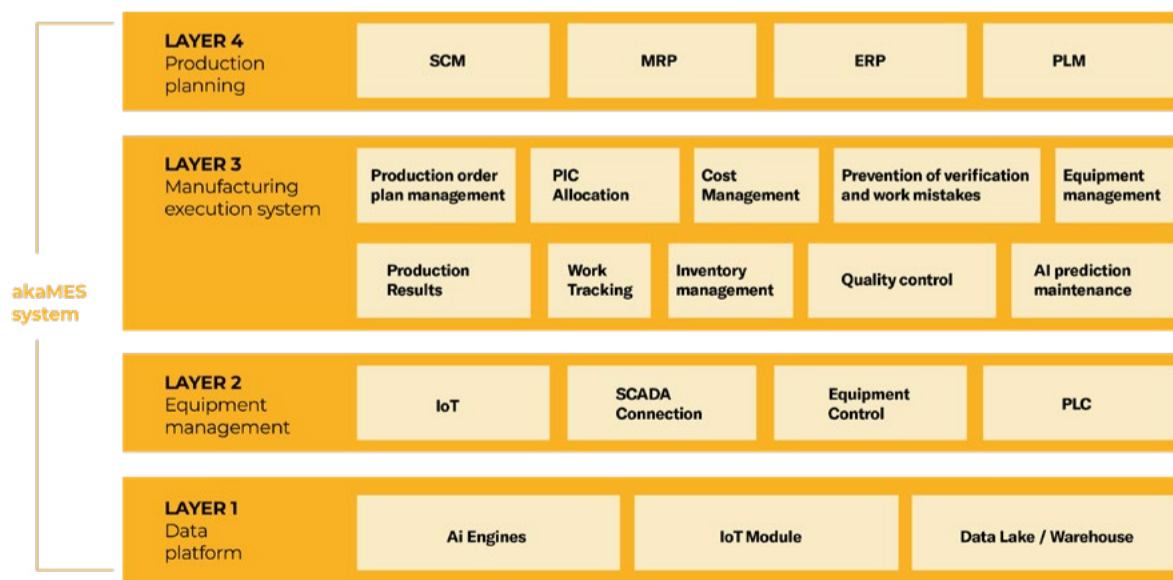


Figure 1: akaMES overall solution



The Solution:

# A Bespoke Manufacturing System

To ensure the new system can address all existing problems, FPT Software's designated team focused on two major tasks: **digitalize operations** to remove paperwork as much as possible and **customize akaMES to client's business model** so that users can monitor all the production stages, thus allowing the company to achieve better information and quality control. The system was deployed on Microsoft Azure and run on both web-based and tablet applications for flexible monitoring activity. The specific solution for each layer was as follows:

- Layer 1: The data platform was developed based on IoT platform and stored all the collected data.
- Layer 2: Most machines and devices, especially in the shop floor, were integrated with sensors, bar codes, QR codes, RFID (Radio Frequency Identification) to record data in real-time. The information on statuses of raw materials, semi-finished, finished goods was also recorded, serving the purpose of quality control and outgoing product inspection.
- Layer 3: The manufacturing execution system consisted of 10 modules that cover different functionalities. For each module, data would be displayed in the form of visual charts or statistic tables, making it easier for users to realize and understand changes in a specific operation. Authorized users could give commands via the system such as sending notification calls, announcements, closing or blocking a production order in case of urgency, creating new orders, etc.
- Layer 4: Since data was gathered from various departments and functions, including cost, inventory, scheduling, it can be passed on to ERP system. Data model was tailored to easily connect with ERP concept.

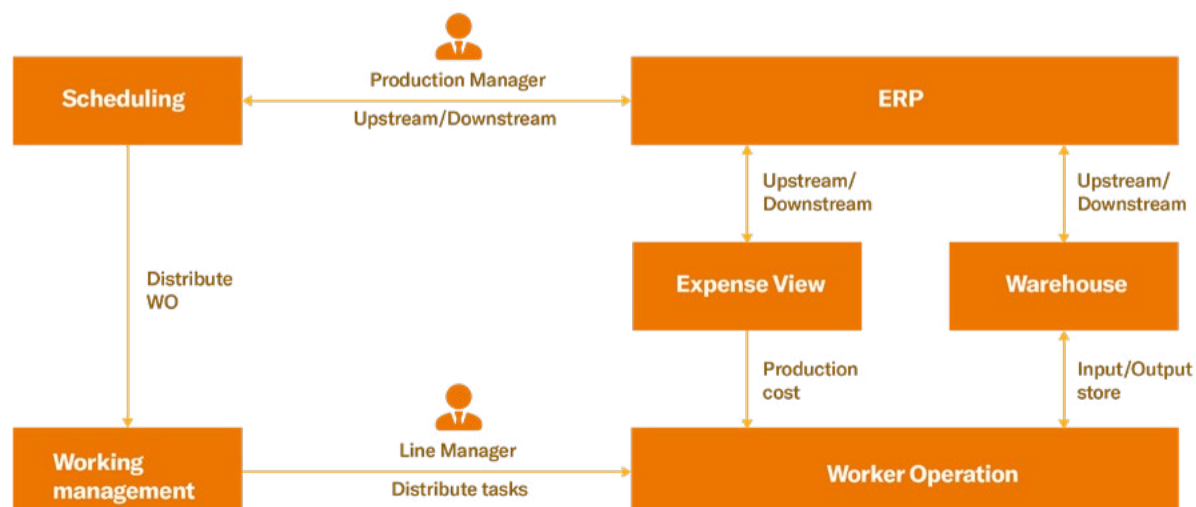


Figure 2: Layer 4 - ERP integration



## The Impact:

# Operation at Ease

- 90% of hard copies were replaced by e-document, overhead expenses decreased by 8%
- A bird's eye view and real-time visibility into the business operations for users

**With 90% of hard copies being replaced by e-document, less resources was required to manage and handle paperwork, hence reducing overhead expenses by 8%.**

Since almost activities were digitized, every party involved in the manufacturing process can perform their jobs more efficiently, thereby improving the overall productivity and performance. Data was gathered from various sources, giving users a bird's eye view and real-time visibility into the business operations, which in turn enabled them to tackle issues that impact the factory's efficiency and throughput. Goods quality was remarkably increased, as products' status was continuously recorded and updated. Some tasks even can be processed automatically such as generating production plan, distributing work orders, which significantly reduced employees' workload.

Once things fell into place, the initial headache caused by the hand-operated method was no longer an issue. As data was automatically recorded, the information was of higher quality and available to be looked up or traced back at any time.

In the near future, the branch will work with FPT Software to integrate machine learning and other AI engines to the system, aiming to further advance its manufacturing capabilities and efficiencies, getting closer to the objective of a 4.0 factory.





FPT Software is part of FPT Corporation, a technology and IT services provider headquartered in Vietnam with nearly US\$1.2 billion in revenue and 29,000 employees. Being a pioneer in digital transformation, the company delivers world-class services in Smart factory, Digital platforms, Cloud, Artificial Intelligence (AI), Robotic Process Automation (RPA), Internet of things (IoT), Mobility, Cloud, Application Services, Managed Services, more. FPT Software has served over 700 customers worldwide, 83 of which are Fortune 500 companies in the industries of Manufacturing & Automotive, Communications & Media, Logistics & Transportation, Healthcare, and so on.

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