EARLY ADOPTERS PROGRAMME: SUCCESS CASE

Politecnico di Milano (POLIMI) is a prestigious technical university in Italy, renowned for its engineering, architecture, and design programs. Founded in 1863, it stands as a center for innovation and research, contributing significantly to the fields of science and technology.

SUMMARY

In this interview, Nima Rahmani from POLIMI discussed the **successful implementation** of a new technology in the manufacturing sector, focusing on Industry 4.0 and advanced manufacturing management. Rahmani described how POLIMI's research facility had integrated **digital technologies** to enhance the **interoperability** among manufacturing systems, featuring an advanced setup with **robotic assembly lines, cobots, and automated guided vehicles.** The integration of existing assets into digital frameworks was significantly accelerated through the Asset Administration Shell **(AAS)** concept, **improving production scheduling, control, and analysis**. Rahmani also shared insights into the implementation of their DIMOFAC EoI service with its beneficiary, where POLIMI's technology was applied.

"We've seen this **implementation as a real success.** The company is now in a position where they can closely monitor their processes, especially the tasks handled by robots, thanks to the services we provided.
Our simulation department played a significant role here, allowing them to dive deep into how the system behaves and identify any potential bottlenecks during tasks. **It's been a game-changer for all of us**."

SOLUTIONS IMPLEMENTED

Digital Integration for Smart Manufacturing: POLIMI's Asset Administration Shell Solution

POLIMI implemented a solution that integrated digital technologies into manufacturing processes, focusing on the use of the Asset Administration Shell concept. This approach allowed for the rapid integration of existing assets into digital frameworks, facilitating efficient production scheduling, control, and analysis. The solution included a sophisticated setup featuring mobile robotic assembly lines, collaborative robots (cobots), and automated guided vehicles, which enhanced interoperability among manufacturing systems and offered improved data availability for more informed decision-making in production environments.

NIMA RAHMANI CHOUBEH
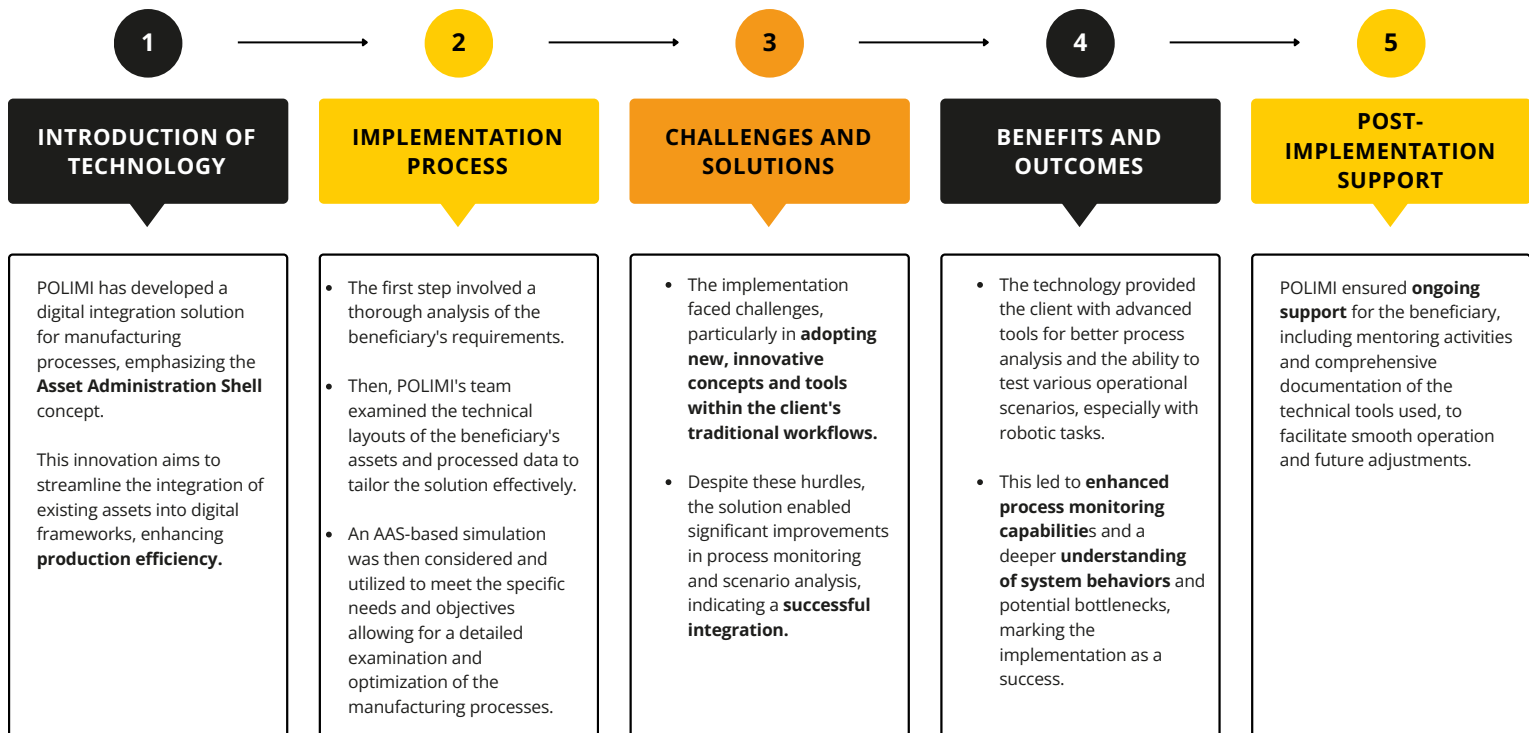Researcher at Politecnico di Milano

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KEY INSIGHTS

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INTRODUCTION OF TECHNOLOGY	IMPLEMENTATION PROCESS	CHALLENGES AND SOLUTIONS	BENEFITS AND OUTCOMES	POST-IMPLEMENTATION SUPPORT

POLIMI has developed a digital integration solution for manufacturing processes, emphasizing the **Asset Administration Shell** concept.

This innovation aims to streamline the integration of existing assets into digital frameworks, enhancing **production efficiency.**

- The first step involved a thorough analysis of the beneficiary's requirements.
- Then, POLIMI's team examined the technical layouts of the beneficiary's assets and processed data to tailor the solution effectively.
- An AAS-based simulation was then considered and utilized to meet the specific needs and objectives allowing for a detailed examination and optimization of the manufacturing processes.

- The implementation faced challenges, particularly in **adopting new, innovative concepts and tools within the client's traditional workflows.**
- Despite these hurdles, the solution enabled significant improvements in process monitoring and scenario analysis, indicating a **successful integration.**

- The technology provided the client with advanced tools for better process analysis and the ability to test various operational scenarios, especially with robotic tasks.
- This led to **enhanced process monitoring capabilitie**s and a deeper **understanding of system behaviors** and potential bottlenecks, marking the implementation as a success.

POLIMI ensured **ongoing support** for the beneficiary, including mentoring activities and comprehensive documentation of the technical tools used, to facilitate smooth operation and future adjustments.

TAKEAWAYS

- **Interoperability was Enhanced:** The integration facilitated smoother communication between various manufacturing assets, streamlining operations.

- **Efficiency was Improved:** The process of digitizing and integrating existing assets was accelerated, leading to quicker advancements and less downtime.

- **Monitoring and Analysis Capabilities were Advanced:** Beneficiaries gained the ability to more effectively oversee their operations and analyze the performance of robotic tasks, which helped in pinpointing areas for improvement.

- **Testing of Scenarios through Simulation:** The application of simulations allowed beneficiaries to explore different operational possibilities, aiding in refining processes and strategic planning.

- **Continued Support is being Provided:** Following the implementation, POLIMI ensures that beneficiariy has the necessary support and resources to maintain the new systems and address any subsequent challenges.