

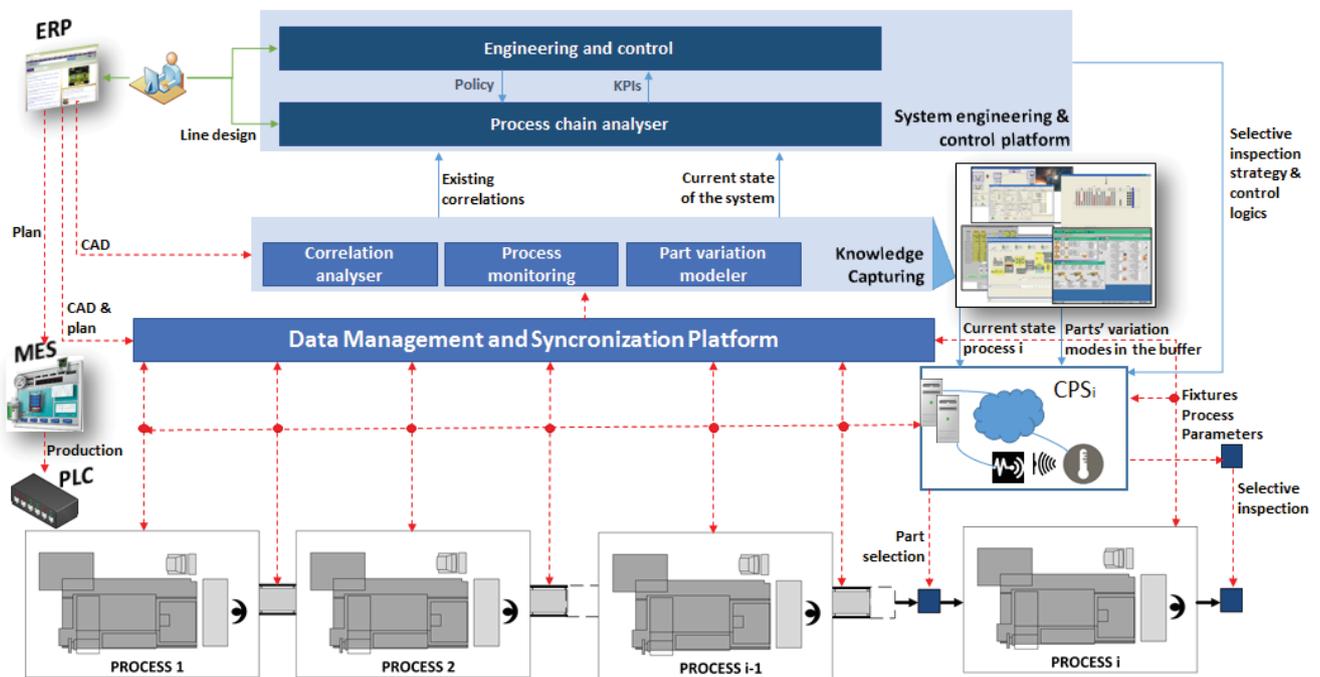
Integrated Zero Defect Manufacturing Solution for High Value Adding Multi-stage Manufacturing systems

Manufacturing companies are continuously facing the challenge of operating their manufacturing processes and systems in order to deliver the required production rates of high quality products of increasing complexity, with limited use and waste of resources.

"Zero Defect Manufacturing" (ZDM) is a recent paradigm aiming at going beyond traditional six-sigma approaches in highly technology intensive and strategic European manufacturing sectors through new knowledge-based approaches. The ZDM paradigm is of key importance to manage production quality targets in advanced manufacturing industries. The implementation of this paradigm in the industry requires innovative defect management and control methods, novel technologies for in-line inspection and integration of knowledge management and ICT tools for smart and sustainable decisions in complex industrial scenarios, which are not available in the market.

The aim of the ForZDM project is to develop and demonstrate tools to support the rapid deployment of ZDM solutions in the industry and design more competitive and robust multi-stage manufacturing systems.

The proposed ZDM approach is based on the combined adoption of new knowledge based data-gathering and root-cause analysis solutions to reduce the generation of defects as well as new on-line defect management and improved production traceability solutions to mitigate the propagation of defects along the production line stages. This will be achieved through the proper integration of innovative enabling technologies, such as cyber-physical systems, selective inspection, advanced analytics and integrated process and part-flow control solutions.



The vision of ForZDM is to achieve near zero defect level in all European strategic manufacturing sectors, with emphasis on production of high-value, high-performance parts. This will be achieved by improving, consolidating and formalizing an innovative Zero Defect Manufacturing (ZDM) methodology which will be implemented and validated in three industrial use cases, focused on the manufacturing of shafts in aeronautics, axles in railway, and microcatheters in bio-medical industries, thus covering a broad range of manufacturing contexts. This methodology expands current single process boundaries towards a production line perspective, enabling a systematic and systemic defect avoidance strategy, which makes it possible to contrast defects

1. before, during and after their generation through diagnostic, preventive and corrective mechanisms
2. applied with real-time, medium term and long term control actions
3. by resorting system resources and globally coordinating and optimising their usage.

