## GF Agie Charmilles, 14/02/13: Integration of EDM devices to modern manufacturing environments through a smart process control and automated management systems

Modern manufacturing environments have to answer to critical issues regarding productivity, connectivity, precision and flexibility in order to satisfy increasingly dynamic markets and exponential growth in segments related to ICT, electronics, mechanics, aerospace and medical industries.

GF Agie Charmilles has defined the development of technology and business as key strategic axes in those segments and recent commercial successes have confirmed the relevance of such focused initiatives. As part of these efforts, GF Agie Charmilles participates in a European research project called FoFdation and develops, together with the consortium partners, innovative tools for improving the two-way communication between historically disparate systems related to CAD design, process control, CNC peripheral systems management and activities of various devices within a machining centre. Subsequently, partners are defining a novel smart system able to monitor, identify, optimise and integrate EDM machining processes taking into account constraints arising from the shop floor and higher management levels. Such a framework is illustrated in Figure 1.

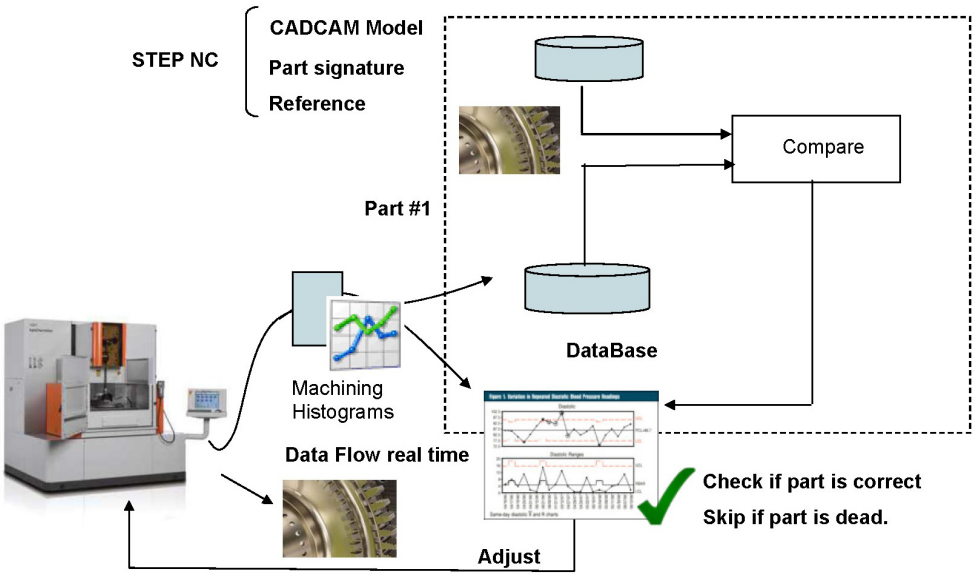


*Figure 1: A smart management and communication system for EDM machines*

EDM devices have the advantage of integrating modern process control with closed loops maximizing the machining performance based on the monitoring and update of the electrical signals associated with spark ignition and control. The new FoFdation system has therefore focused on the development of a PC based system containing previously disconnected stages of manufacturing like CAD/CAM, database selection and communication with a central management system linking several machines in a production cell. Furthermore, the process smartness will be increased by developing FoFdation components like the EDM Smart Machine Optimiser (SMO) and the EDM Smart Machine Control (SMC), which will be able to monitor process signals, and identify and correct the part if ever the initially defined process does not meet the specifications and tolerances defined by the customer. This process is illustrated in Figure 2.

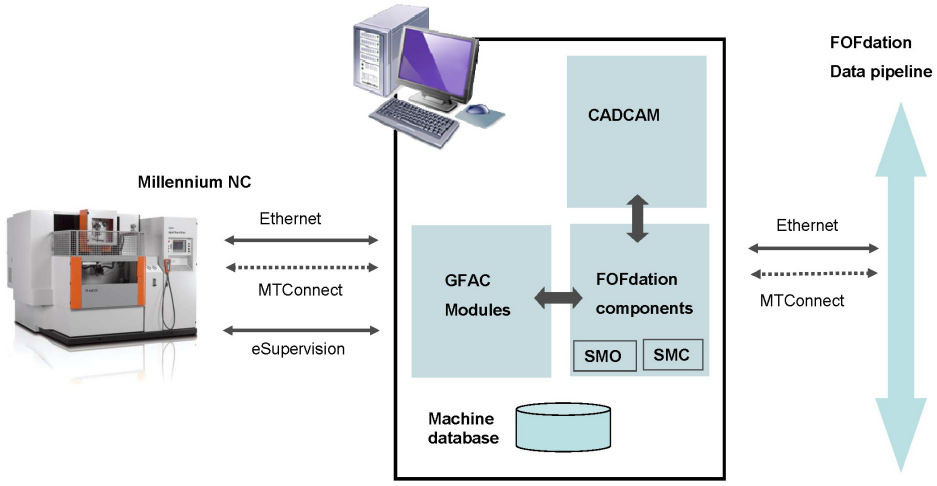


*Figure 2: EDM Smart manufacturing systems showing the principle of an intelligent supervision and optimisation process*

The new system will be able to monitor in real time the key process signals and compare them with a database storing the information required to identify events associated with specific defects or tolerance bands for a given application. Such occurrences will be represented in the 3D CAD model facilitating additional information processes by the customer and supporting decisions regarding quality controls and quality assurance in their production process. The final step will be to automate the adjustment process with respect to those references through the Smart Machine Optimiser system capabilities. Implementing the SMO with additional relevant monitoring devices (e.g. power meters and energy monitoring) will help the users to monitor and optimize energy and materials consumption, and improve the efficiency of their production cells by eliminating current time-consuming and high-cost quality control procedures. This will eventually eliminate the material losses and process aspects leading to defects in geometry, mechanical properties, visual impression and tool or component performance during its use phase.

For more information about the FoFdation project visit **http://www.fofdation-project.eu** and the project's social media pages, including Facebook (**#fofdationproject)** and Twitter (**@FoFdation**).

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*For further information please visit:*
*http://ec.europa.eu/research/industrial_technologies/factories-of-the-future_en.html*