Prima Additive

AI OPPORTUNITIES AND CHALLENGES FOR A MACHINE TOOL BUILDER

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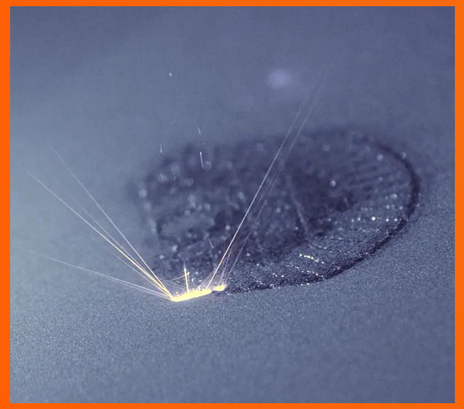
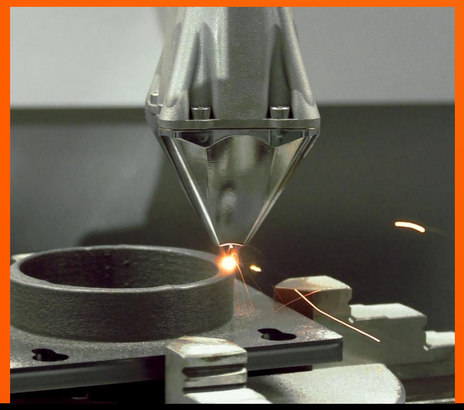
What do we do

We create **industrial systems for metal additive manufacturing** with two different technologies based on the use of lasers: **Powder Bed Fusion** and **Direct Energy Deposition**.

In addition to the machines, we provide **consultancy and support** to our customers, accompanying them throughout the process of adopting the technology in their production context: from design optimization to the choice of materials, to the study of the business case up to the choice of most suitable machine.





PRIMA ADDITIVE

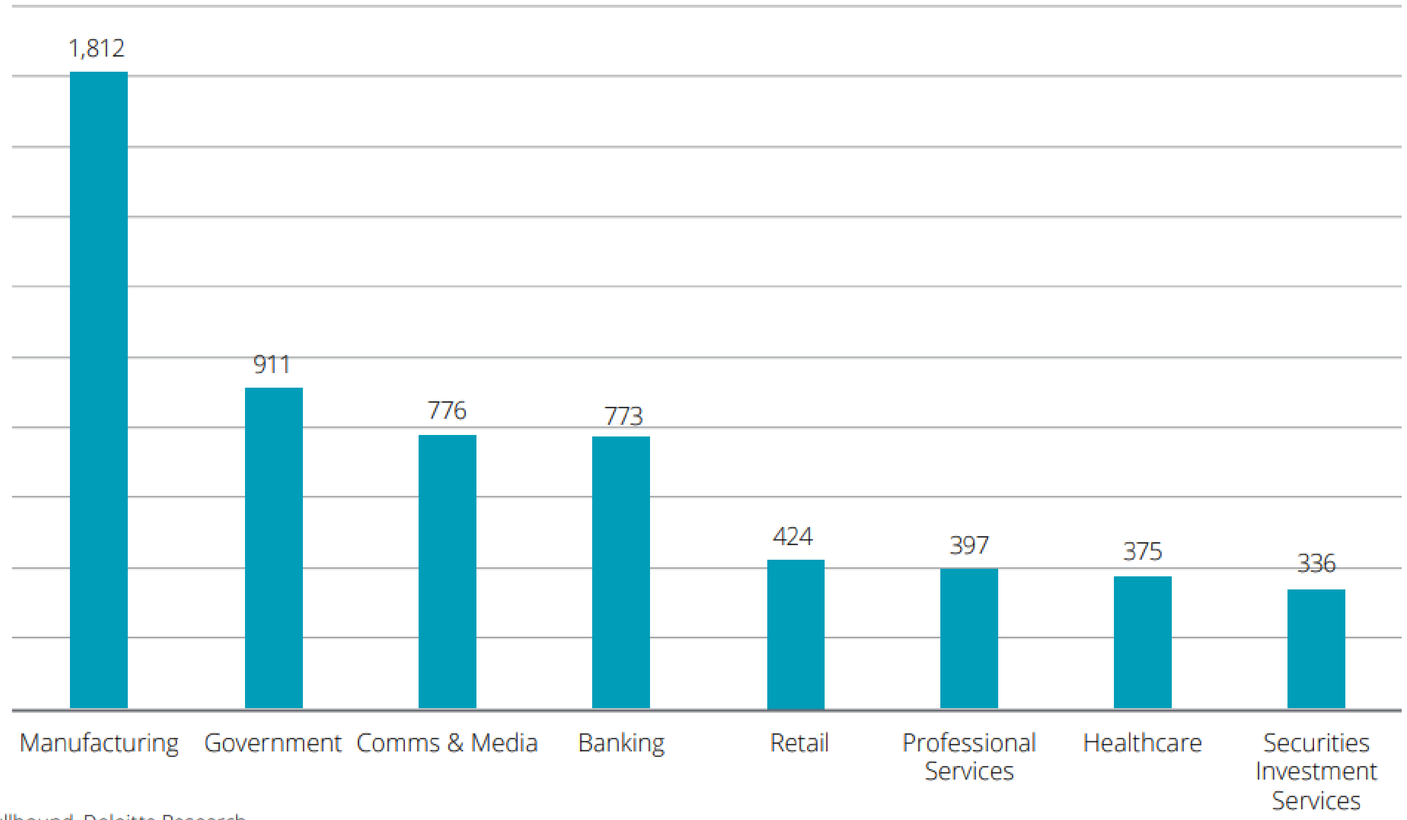
AI Value in manufacturing sector

AI VALUE

AI can be considered as **Key Enabling Technology** in the Manufacturing sector, as it feeds the value of the production system chain and has the ability to innovate processes, products and services thanks to a better management of digital content

Manufacturing tops in volume of data created

Annual data creation by industry (petabytes)



Source: GP Bullhound, Deloitte Research

The added value will be given by good data management and a new process intelligence linked to a series of highly integrated technologies

AI Applications in the Additive sector

Prima Additive is always at the cutting edge of innovation and is currently working on the implementation on their own products of AI technologies, such as **Machine Learning**, **Machine Reasoning** and **Neural Network**

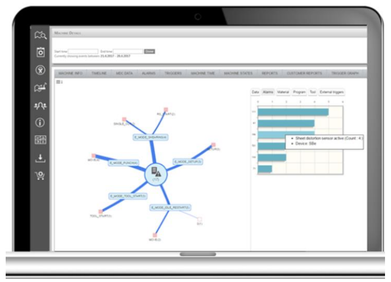
Application sectors in which this AI solutions are being developed or will be launched shortly are the following:

ZERO DEFECTS MANUFACTURING: integration of new sensors and development of ad-hoc application for the ZDM (Decision support app)

SUSTAINABILITY: green means banner translate into technology and knowhow the requirements of productivity and sustainability

PREDICTIVE MAINTENANCE: thanks to an in-depth development of big data analysis thanks to greater sensorization

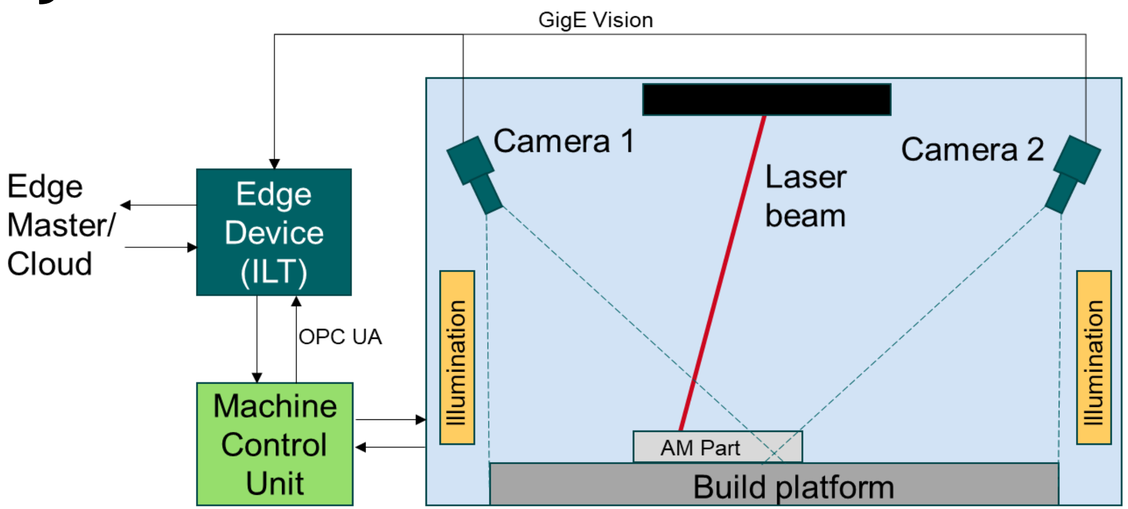
CUSTOMER SERVICE: Root cause analysis helps to figure out the best solutions for customers

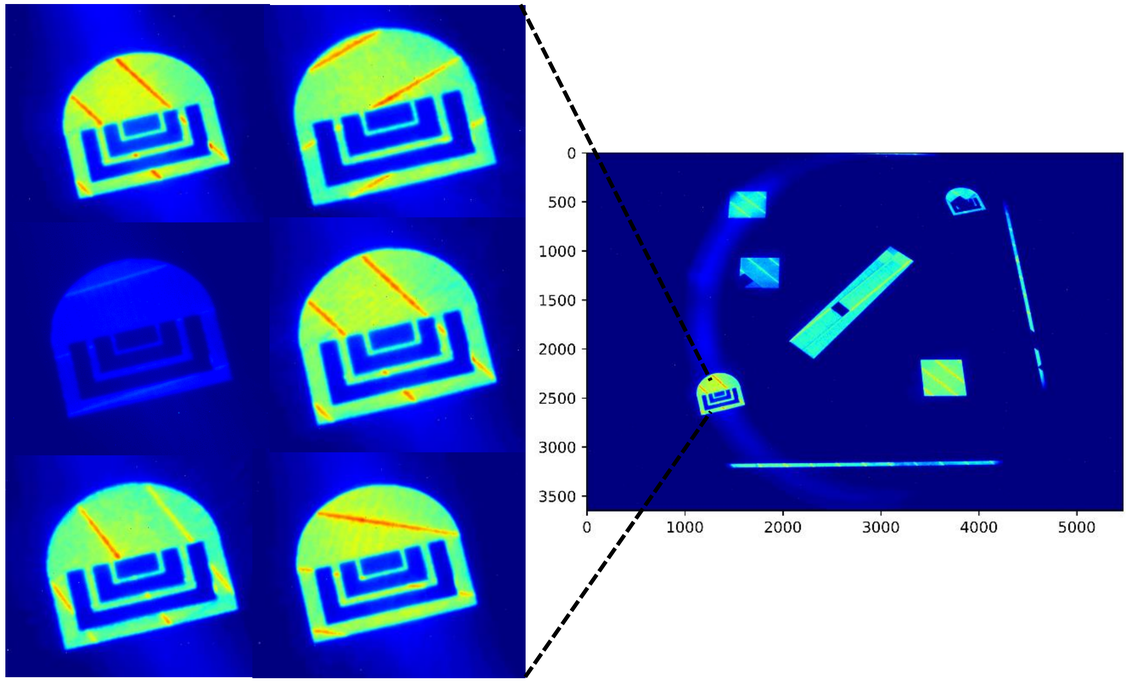


AI Focus on Innovative Project – PBF Case

PBF machines are now equipped with **sensors** and **cameras** that monitor the status and production, but the operator is still too essential for the success of the production and the **monitoring of process parameters.**

This is something that must be done automatically and **controlled by an intelligent system**, which replaces the operator in this task of monitoring and setting optimal parameters.

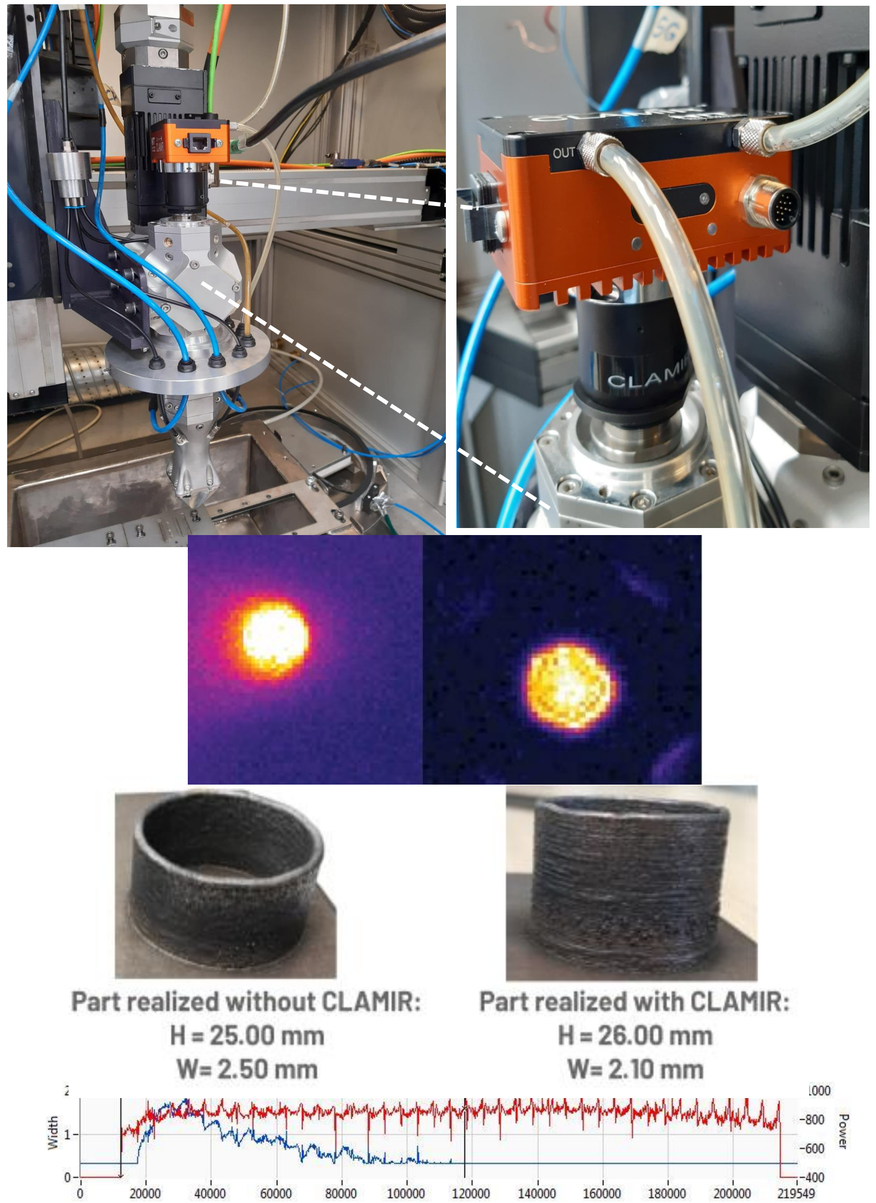




AI Focus on Innovative Project – DED Case

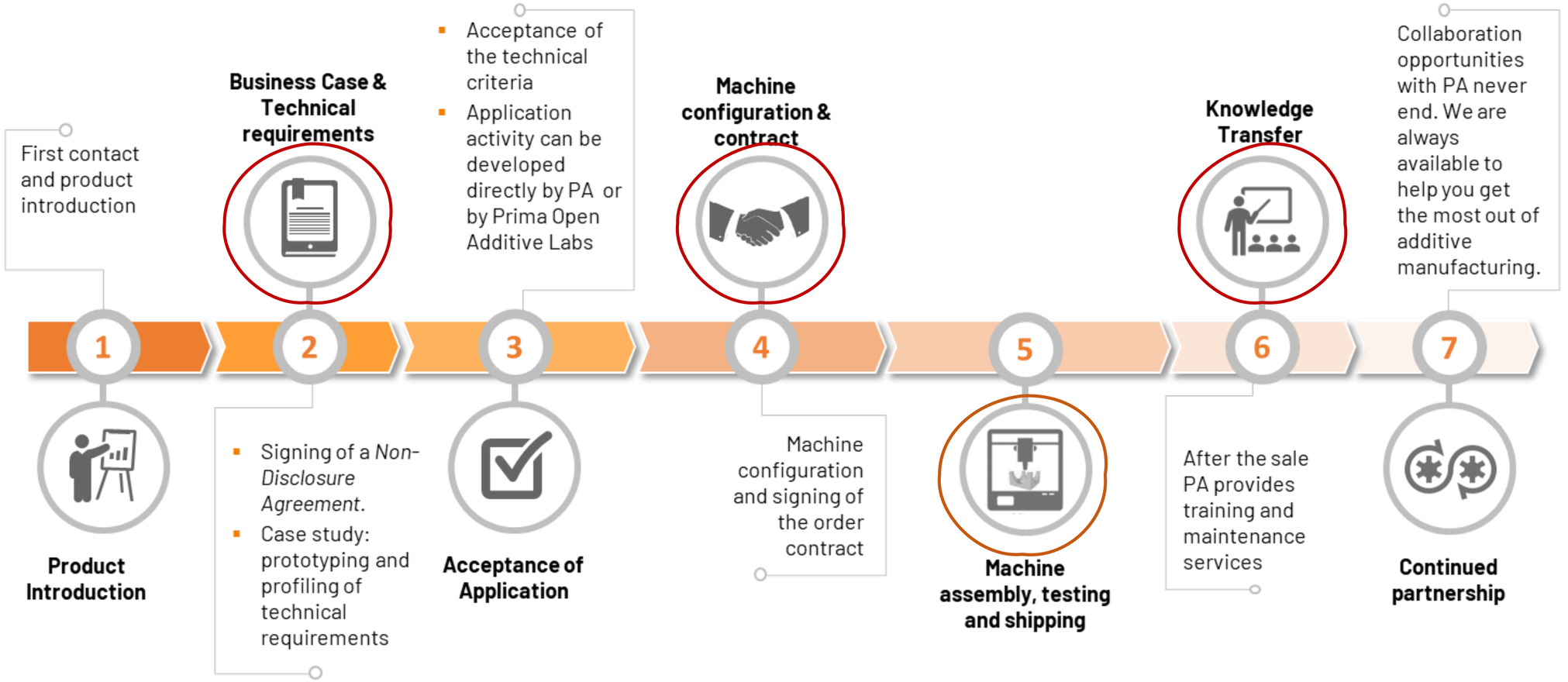
Even in the DED case, more than in PBF, **Artificial Intelligence systems are relevant** because in case of failure or defects on the component, the job must be stopped, cleaned, the piece rectified and put back into the machine with a **long and manually realignment work**.

Even in these case, the machines have been **sensorized** a lot: there are a lot of graphic data and images to be analyzed to start **parameter correction actions in real time**, but at the moment the systems on the market take into account only a few facts (laser power an melt pool) for which more **complete and complex systems** should be implemented.

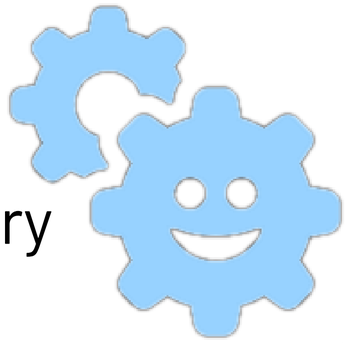


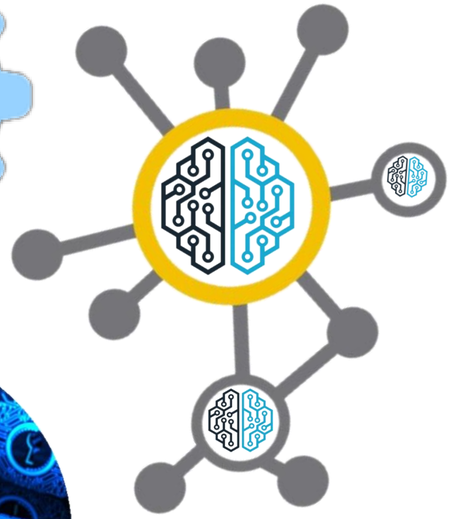
Application driven

Additive manufacturing today is still predominantly application-driven and the key factor for its adoption is the validation of applications. AI solution can bring real benefit to this process in order to optimize it and help customer and suppliers to speed up the process and provide useful information



AI Barriers and challenges





Developments of artificial intelligence solutions are very recent, and therefore experts in the sector or well-established business models based on AI are not yet in place.

Existing barriers and threats to the application of AI solutions are:

- Lack of a clear business strategy for AI adoption
- Lack of qualified professionals
- AI-based system requires a tremendous number of resources, such as memory, computing power and data
- Cybersecurity vulnerabilities, malicious corruption or manipulation of the data.
- Data accuracy for training AI, inaccurate data will lead to inefficient outcomes
- Human-AI reliability

Thank You

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