Business challenge

Wanting to reduce the number of units that needed to be scrapped from its manufacturing runs, UMBRAGROUP S.p.A. wanted better insight into its production efforts.

Transformation

Concerned with the level of non-conforming parts in its high-precision manufacturing processes, UMBRAGROUP worked with IBM and IBM Business Partner Nodes S.r.l. to create a modeling and prediction solution based on IBM® Watson® Studio technology. The platform helps to identify previously unknown factors that can hamper successful production runs.

Results

>20% reduction
in non-conforming production materials, boosting profitability

Improves production quality
with modeling that can vet manufacturing changes before they're deployed

Simplifies analytics
and prediction efforts with an intuitive platform

UMBRAGROUP S.p.A.

To outsmart some manufacturing challenges, you need more than human analysis

UMBRAGROUP is a leading global manufacturer of ball screws, electromechanical actuators, bearings and other high-tech components for the aerospace and industrial sectors. The business, originally founded in 1972, is headquartered in Foligno, Italy with additional production sites in Germany and the US.

"From analyzing the data, we came to some very unexpected conclusions regarding our processes that we never considered."

—Mauro Bernareggi, Chief Information Officer, UMBRAGROUP S.p.A.

Nodes

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Non-conforming inventory, non-conforming profits

No one likes wasting efficiency and money, particularly manufacturers. Given the amount of time, energy and effort that goes into gathering the necessary raw materials, preparing them to exacting standards and finally assembling them into a usable product—any defective or unusable unit can be downright annoying. Or even worse, financially damaging.

And the more complicated the product, the more frustrating non-conforming production runs can be.

"We're producing high-precision mechanical components—like recirculating ball screws for the aerospace industry," explains Mauro Bernareggi, Chief Information Officer at UMBRAGROUP. "Some of our products take up to four months to make. And if you produce non-conforming items after months of working, the economic impact is high."

In particular, UMBRAGROUP was concerned with these non-conforming parts as they occurred in later production stages, when value is more relevant. "As those numbers add up," continues Bernareggi, "it affects the profit and value of our business. We had tried to address this issue as part of our continuous improvement efforts, still there was room for improvement—so we

decided to go with a different approach using analytic and predictive tools."

Having poured over countless production records and reports, the business needed to shift its approach to a new method of considering the problem. "It was around three years ago when we first heard about machine learning and AI," adds Bernareggi. "And we saw how some were using this technology to analyze data stemming from different sources to identify root causes that were not obvious to human analysis. We needed something like that."

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>
> —Guillaume Ammassari, Sales Director, IBM Business Partner Nodes S.r.l.

Know the present, predict the future

UMBRAGROUP, a long-time IBM client, approached the company for help, and it put the manufacturer in touch with IBM Business Partner Nodes.

Working together, UMBRAGROUP, Nodes and IBM produced an initial proof of concept (POC) that used Watson™ technology to derive new insight and understanding from the company's production data. The Nodes team, in particular, evaluated UMBRAGROUP's various back office systems, identifying its ERP and manufacturing execution system (MES) as particular focuses.

"The first step," explains Guillaume Ammassari, Sales Director at Nodes, "was to make sure that we had the right data. If you want the algorithm to work correctly, you need good data. Otherwise you're going to have a problem."

And with the appropriate systems identified, the Nodes team then cleaned up the data, placing it in a usable format for the analytics and prediction engine.

After a successful POC, UMBRAGROUP worked with Nodes and IBM to create a more robust, long-term version of the platform. Watson Studio serves as the heart of the solution, analyzing and drawing conclusions from the existing data as well supporting the build of new models and prediction processes.

"From analyzing the data, we came to some very unexpected conclusions regarding our processes that we never considered," notes Bernareggi. "For example, we discovered that after we set up specific tooling, the first lot produced reported a relatively high percentage of non-conforming parts. Consequently, we changed operating processes and that drove dramatic improvement."

He continues: "We also noticed that a lot more non-conforming parts are probable if we stopped certain machines (where extremely tiny

tolerances are allowed) and restarted them a half hour later. Now we try to avoid stopping these machines during the day for whatever reason. So rather than shutting down for lunch, we stagger shifts for continuous work."

Beyond this initial analysis, UMBRAGROUP continues to use the solution to monitor current production efforts and to mitigate future waste. "In the toolkit, we have a way to analyze constantly," adds Bernareggi. "Every week we check our data to see if there is something else that might pop up that we did not consider. Or if we plan to make a change, we can model how much scrap that change might cause."

Less waste, less hassle

After addressing the issues identified by the analytics engine, UMBRAGROUP substantially reduced the volume of non-conforming product—a greater than 20% drop compared to the previous year. And along with this reduction came significant time and cost savings.

In addition, the solution offers the ability to further refine manufacturing processes on an ongoing basis, identifying inefficiencies and other bottlenecks that could undermine effective production.

"They now have everything that they need to predict, anticipate and avoid new problems," adds Ammassari. "The right data. The right algorithms. The right solution."

And UMBRAGROUP couldn't be more satisfied with its choice.

"To be honest," adds Bernareggi, "after the proof of concept, we evaluated a number of providers. Eventually we decided to go ahead with Nodes and IBM. From Nodes, we recognized their high skill in extracting value from the data. Everything in this project came from that core skill. And they really demonstrated with the POC that they understood our data and our business needs perfectly."

He continues: "And IBM was delivering to us a toolkit that was easy to use. The key for us was the simplicity, the user-friendliness of the solution. This project was managed by a business lead—we don't have enough resources in IT to run this project. Without any programming, we just plugged Watson Studio into our ETL [extract, transform, load] processes, and it was ready."

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Solution component

- IBM® Watson® Studio

Take the next step

To learn more about the IBM solution featured in this story, please contact your IBM representative or IBM Business Partner.

About Nodes S.r.l.

Founded in 2006, IBM Business Partner Nodes offers IT products, solutions and services targeted at the Italian market. The business specializes in data governance and systems for monitoring, measuring and improving data quality, and it is headquartered in Rome, Italy.

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