

Nordmeccanica adopting 4.0 technologies

Abstract

Nordmeccanica is one of the most innovative companies in Italy. Innovation is deemed important to face current challenges, maintain a competitive positioning and lead the new industrial revolution. Nordmeccanica sees in 4.0 technologies an opportunity to evolve and develop its business. Partnerships with other companies proved to be essential in this regard and led to the creation of innovative tools to support industrial IoT.



Introduction

Nordmeccanica is an Italian excellence in the hi-tech packaging machinery sector, with seven plants in three different continents and over 280 employees. In 1998 the company was close to bankrupt with about 40 billion debts of the old liras, when the Cerciello family acquired it. In the next years, the company passed from €7 million to €110 million revenues, with a profit of 10%. Starting with the first machines built in the 70's all the way through to the most recent and highly innovative Triplex SL One Shot, the growth in Nordmeccanica has been equally harmonized between production capability and expansion of export: starting at 3.000 m² (33.000 sqf) of production facilities in the early days, up to today's 30.000 m² (320.000 sqf), with 65% global market share and with over 2.500 machines installed. Apart from the Piacenza Headquarters, it has two more factories in Piacenza and four more in New York, Buenos Aires, Shanghai and Mumbai. The company reached forty years of activity in 2018 and nowadays controls a global market share of 75% in flexible packaging and 55% in the industrial applications sector.

Nordmeccanica has always focused its attention on innovation. The R&D department consists of 30 people and 5% of turnover is invested every year in research and development. During the years the company has created a series of machines which have, then, been regarded as a reference point by its clients. In the last years the evolution of electronics and software technology, with the innovations of Internet, Cloud Computing and Internet of Things, has offered important progress opportunities. The latest innovation is a system that controls and sets machines from distance with augmented reality, developed in collaboration with Siemens. During the years the company has partnered with giants of the electronics, chemistry, informatics like Siemens, Amcor, Dow Chemical and Hp.



Triplex SL One Shot, one of Nordmeccanica's most advanced packaging machines (source www.nordmeccanica.com)

Challenges

Innovation and reliability are the basic principles behind every new development in Nordmeccanica.

President Antonio Cerciello says that investments in technologies and internationalization go at the same pace; research and development aim both at improving the products and at covering new territories. New technologies are engineered based on development of prototypes and are tested in the most extreme and challenging conditions before being commercialized.

Diving into Industry 4.0 is a must in order to stand up to the challenge with local competitors and expand in a technologically advanced market, which needs data exchange between machines and management, simplified tools and high security. Technology integrates the qualitative aspect, which means that the improvement in the technologies applied to the products doesn't reduce the importance of high-quality components.



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In this fourth industrial revolution, an important role will be played by augmented reality, which will give various benefits in the productive process, maintenance, remote assistance e so on. Considering Nordmeccanica's plants considerable dimensions and complexity, there was the need of a device able to satisfy different requirements:

- The display of machine parameters in real time on-site without having to go back to an operator panel;
- The identification of various work areas, machines and under appliances, and the possibility to give operators or maintainers all the information needed.



How will solve the problem?

The innovative solution, found in collaboration with Siemens and Expertenti, was identified in the Industrial Tablet PC SIMATIC ITP1000, for which an adequate interface was developed, able to exploit augmented reality.

These are the functions supported by the device:

- On the tablet a reduced size vision of the machine is available and it is possible to set and read the parameters on site;
- Using a specific application, it is possible, visualizing the QR code placed on the machine, to launch a report with data from the identified object. The data can only be examined, they serve as a photography of the machine status and are helpful to obtain information about a certain part of the machine or of the production line. This is crucial if a technical intervention is needed.

The machine, now equipped with the augmented reality tablet, was installed and started in the first semester of 2018. It is 8m high and 50m long, able to produce polyester film 2m and 30cm large. The new machine for the coating process has a commercial value of 6 million euros.

Vincenzo Cerciello, technical director of the company, explains: “Nordmeccanica has been working in a 4.0 logic since the start of 2000, with the complete integration of the machinery in the business productive cycles and the data exchange with the internal management systems. It was a forced choice, in order to face our German competitors, who have been working on this logic for over 20 years.

For a long time now, we are the leaders of this sector, thanks in particular to the partnerships that we have built with big international players like Siemens.”

The personnel operating on the machine equipped with the tablet is not restricted to the areas where the HMI (Human Machine Interfaces) are located but can move along all the perimeter.

This allows various benefits:

- Much less fatigue during work because it is not essential to move along the three-floor machine;
- A more rapid action since it is possible to identify the interested point and act immediately;
- Less errors, because their identification is certain;
- Cost saving, as a consequence of the improved rapidity in which technical problems are picked out.

It's not possible to quantify the costs saved and the improvement in efficiency and productivity because the machine was born equipped with the tablet, so there was no prior scenario in which it was working without its support.



Simatic ITP1000

The partnership with Siemens started in 2002. The aim was to realize integrated automation machines, able to build communication models among them and with the enterprise. The computer installed in the machines allows data analysis and signals if the operating parameters, as set, are different to those shown when the device is working. In this case it is appropriate to intervene. The system allows to memorize the history, namely everything that happened to the device. Remote control is also available and very important: it's possible to connect to the device to understand if any part is damaged. This allows to shorten intervention times and downtimes or to activate preventive maintenance.

Thanks to this operational system it is possible to collect and analyze data that are now considered as the treasure of Industry 4.0 and out of which enterprises can make the most, through digital technologies. Nordmeccanica is among the companies that founded the association Mindsphere World Italia in order to manage data through a secure cloud. Mindsphere is an open operating system for the IoT industry based on cloud and at the center of Siemens' offer in the digitization field. It's an ecosystem that allows to gather, analyze and transform data provided by a factory, a plant, a machine or a production line into knowledge, information and Know-how, the basis for companies success in the times of Industry 4.0. MindSphere's mission is to become the IoT standard for cloud applications not only in the industrial world but also in infrastructures. The association wants to expand the global reach of this ecosystem, as well as provide support to its members in the development and improvement of the IoT solutions on Mindsphere's platform other than in the involvement of new markets in the digital economy. Among the goals, the definition of suggestions on the requirements of the platform from the industrial sector, the creation of equal rules for data usage and the promotion of research and development on this field, other than specialized training.

Nordmeccanica well knows that the current market not only requires more and more performing machines but also more digitalized, connected and therefore more intelligent ones, with a view towards industry 4.0, in order to monitor and optimize the efficiency of the production of assets, thus providing new possibilities and new services to its customers.

References

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