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Industrial Internet Of Things

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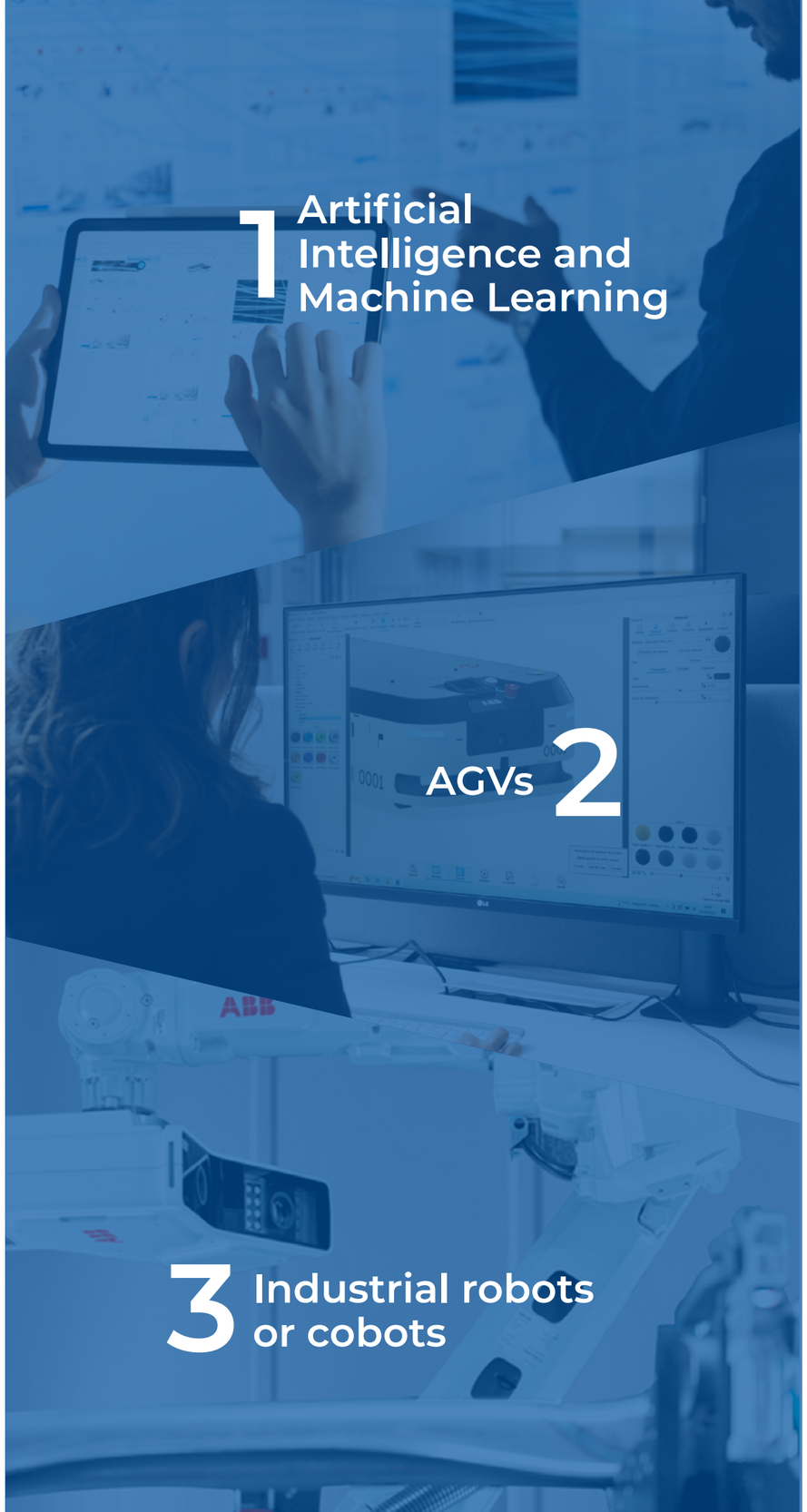

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Design
that matters

1 Artificial Intelligence and Machine Learning

By 2025, the goal for artificial intelligence (AI) and machine learning (ML) is to gain insights into what moves consumers, establish a mature and efficient data strategy, and transform industry. This is certainly a tall order.

If we pause for a moment to remember Asimov's short story The Last Question, we'll surely recall the famous phrase: **"Insufficient data for a meaningful answer".** We could say that our current situation is rather similar, just more advanced. Thanks to artificial intelligence and machine learning, we don't live in complete darkness, nor do we get a right answer 100% of the time.

Let's not forget that humans will continue to be a necessary resource and provide essential support for this increasingly popular technology.

Before we proceed, it should also be noted that machine learning is a subfield of artificial intelligence. Factories, logistics, the chatbot you interact with on your favourite online store... Few areas remain untouched by this technology. Whether you are focussed on B2B or B2C, artificial intelligence plays a key role in pinpointing your clients' preferences and being able to meet their needs almost immediately.

How is this useful?

By analysing data in real time, organisations can be proactive when it comes to data processing and decision-making instead of merely reacting to the data they have gathered. We can use this data to detect and learn about errors for maintenance, or apply them to smart cities, eHealth or consumer requirements.

The popularity of recommendation engines is soaring day in, day out as they offer increasingly sophisticated and customised suggestions.

The industry is prioritising **data science,** powered by AI, **because they are able to use a wide range of regression models, in addition to hierarchical clustering and statistical functions.**

“By 2025, the goal for AI and ML is to gain insights into what moves consumers, establish a mature and efficient data strategy, and transform industry”.

According to data published in several sources, we can see that:

- 40% of marketing and sales departments claim that artificial intelligence and mach0ne learning are a fundamental element in their success (Source: Forbes).
- According to estimates, by 2025 more than 175 ZB of data will have been generated in the world, five times more than in 2018 (Source: IDC Consulting).
- 79% of these data are in text format. This means that natural language processing (NLP) will be another important pillar of data management in the future (Source: IDC Consulting).

As time goes by and the number of connected devices increases, AI will also become more prevalent due to the millions of "inputs", creating reports with as yet unknown information.

AI's reasoning and decision-making capabilities will achieve greater independence; in fact, several scientists predict that their potential will increase exponentially in the future and they will become "thinking machines" with a more sophisticated role in industry.

"Analysing data in real time, organisations can be proactive".

However, this development is not expected any time soon, no matter how many applications currently depend on AI or how much we discuss this popular technology.

In order to understand where we are going, we need to assess our current situation correctly. Being informed and aware of where we are now and current market trends, related to both these and other technologies, will help us gain insights into a promising future. However, this situation is not just around the corner.

We would like to finish off with the following quote from George Santayana:

"Those who cannot remember the past are condemned to repeat it".

2 AGVs: Why should you integrate them in your company?

The Internet of Things (IoT) is part of organizational planning or implementation to achieve a broad list of benefits. We could say that it is the hub of intelligent devices such as AGVs (automated guided vehicles). It is the digital interconnection network between devices, people and the Internet itself that allows the exchange of data.

Combining the IoT with other well-known technologies such as 5G, automation and machine learning (artificial intelligence), it transforms and shapes the way of working in all sectors. In particular, the rise of e-commerce and the sale of robots is causing this market to be in full growth and transformation.

Currently, **one of the great advantages of these robotic solutions (Agvs or AMRs) is that they can be integrated into any company almost immediately,** regardless of their transport and logistics needs.

To face current and future challenges, the integration of robots to the IoT provides the following benefits:

- **Monitoring:** IoT sensors allow the capture of parameters that go directly to the state of the robots, being able to configure alerts for battery levels, load transport, temperature, vibration, etc. Problems, if any, can be addressed immediately thanks to real-time data collection.
- **Usage and performance tracking:** Companies can monitor the efficiency of AGVs (AMRs, too) by analyzing the data captured. As essential tracking parameters, we highlight: the distance traveled, the time of operation and

the cargo transported. Compared to manual labor, these can translate into cost savings or increased production.

- **Remote service and maintenance:** can be remotely monitored and assisted only when problems arise (unless maintenance is scheduled); therefore, the maintenance cost is reduced drastically.
- **Software:** can be controlled remotely through cloud-based applications. Technical problems can be easily corrected and instructions can be transmitted remotely. Therefore, maintenance becomes easy and profitable.

We already have the context! Well, we can now begin to think and delve into robots (AGVs) as machines perfectly designed and orchestrated according to the needs of our customers.

BigD's multi-sector experience allows us to offer tailor-made solutions based on our clients' insights. We are aware that robots (in this case, AGVs) are ubiquitous in the industry, both for specific applications or in new developments addressing specific needs, and companies have realized their potential advantages:

"The IOT is the hub of intelligent devices".

- Increases productivity.
- Data is collected and analyzed in detail in real time.
- Facilitates communication and decision making.
- The IoT ecosystem is enriched.
- Operate more efficiently.

So, why can we ask ourselves if it is a success or a failure if everything points to it being the best investment we can make?

We have the answer if we reflect on the situation in which we find ourselves or may find ourselves. You have to look around you and see how much information you are able to extract from your AGVs or how much you know about your plant to know if integrating AGVs is the right option. And if you are a manufacturer, find out which design best suits your customers' needs, whether you have the ability to adapt to the future well in advance or whether you have to find a "partner" to help you modify certain parts of your robots. or even design certain areas in an integral way.

"There is a risk that you cannot risk taking, and there is also a risk that you cannot risk not taking.". Peter Drucker

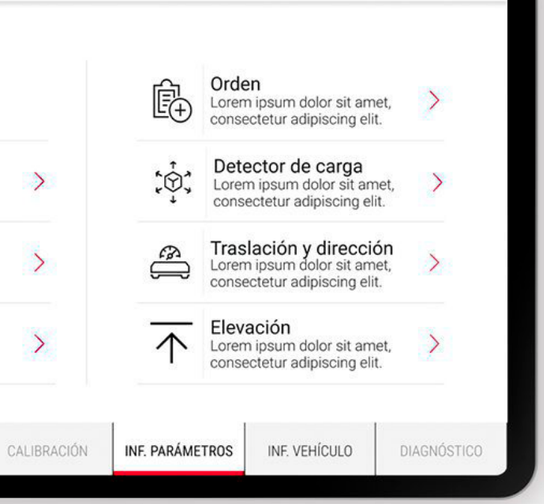
If the answer is that you know the sector well, both as a user and as a manufacturer, you are able to get the most out of your AGVs robots for the benefit of the organization or you are able to anticipate the future, then you are on the right track.

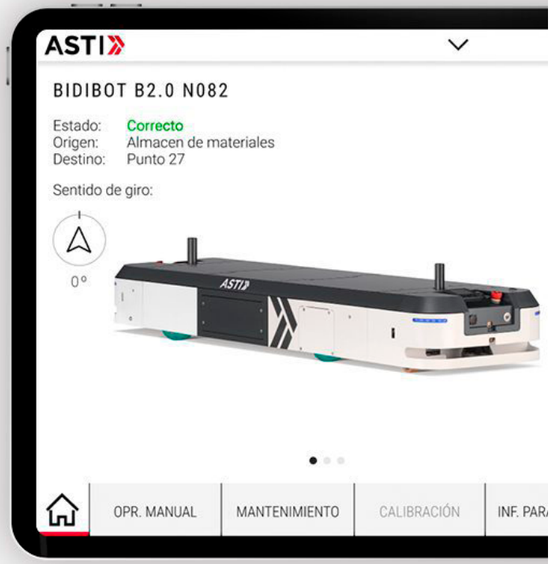
Referring to Peter Drucker's quote above, **finding the right balance between stepping up or keeping a low profile depending on what stage of development we are, will be key.**

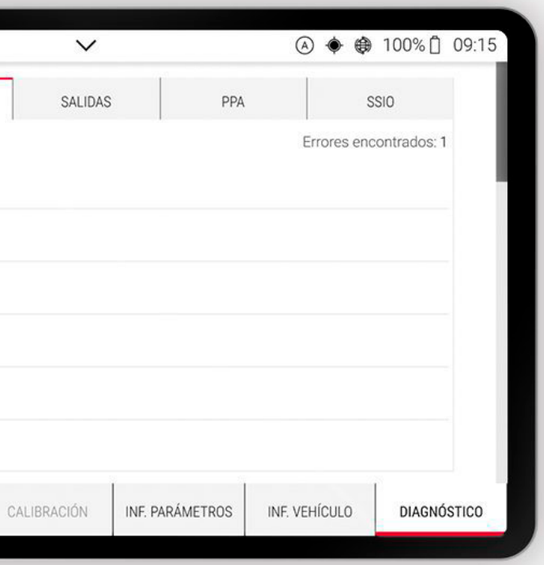
With these "tips" we do not expect you to be an expert in AGVs, but we do want to convey to you the importance of knowing the sector and consulting with experts. We know that it is not easy to make a purchase decision or design new robots, but we are sure that we can help you.

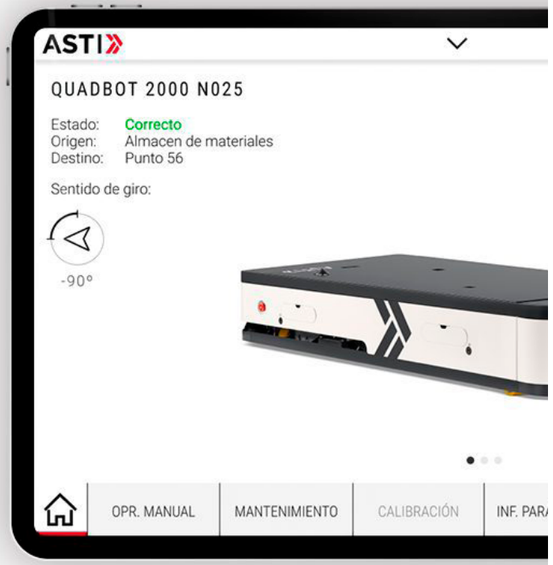
What if we also told you that...?

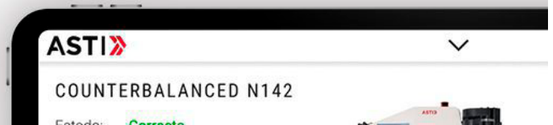
From bigD we have bet to support Asti in the design of new self-guided vehicles. We have created the conceptual design up to the engineering of the plastic pieces as well as looking for the best suppliers.











3 industrial robots or cobots

The International Federation of Robotics (IFR) indicates that we have reached 3 million operational robots in factories around the world. This represents an increse of 10% in 2021 compared to 2020, a fact that should not be overlooked.

More and more companies are daring to automate, seeing the **great advantages that robotics brings to their businesses.** It is true that we come from an unusual stage but, even so, the trend of transforming through robots continues.

In the context of Industry 4.0, the use of robots will help us to increase operational capacity and speed up times by triggering this great change and impact on the industrial sector. But, **how do I know which robots are best suited to my business?**

“The IFR indicates that we have reached 3 million operational robots in factories around the world”.

There are many doubts that may arise when choosing between the different types of robots, but with these inputs and questions that we leave, you can have a much clearer view of what is needed. We even advance you that they are complementary in some occasions.

So, don’t close yourself to a single choice for everything! Above all, **think long term!** This will help you to have an agile and lasting planning in time.

As Stella Terrill Mann says, “Every time we say “be!” in any form, something happens”. And in robotics, it is happening.

According to the UNE-EN ISO 8373:2012 Standard: “Industrial robot is a multifunctional manipulator, automatically controlled, reprogrammable in three or more axes, which may be stationary or mobile for use in industrial automation applications”.

On this basis, we can say that the industrial robot produces in large volume, takes up a lot of space and is usually fixed in one place. While the cobot is compact, occupies little space and can be easily relocated. But the first ones will need great security measures and the second ones are designed to work with people.

Against this background and based on the IFR report, which has served as a preamble, we will discuss the 4 main trends in robots:

- **New industries join the revolution:** Some sectors of the manufacturing industry, relatively new to automation, have opted to integrate robots into their operations. The rise of e-commerce has revolutionized everything from internal logistics to returns and labor shortages. **Logistics is one of those sectors in which digitalization, through the implementation of robots, has left no one indifferent.**
- **Ease of use:** Installing and using a robot has never been so easy. The user interfaces allow simple and easy programming and customization.The software/hardware combination is a tandem that has reduced its complexity for the benefit of users. If we add to this a trend towards low-cost robotics, because they already come pre-configured and come with grippers, sensors and controllers, the combination is perfect.
- **The data generated supports digital automation:** We must mention the special importance of data collection and the use of data in production processes. If we have data, we have a great advantage in operations. The information obtained in automated processes will lead to make much more accuate decisions.

- **Robot and human cooperation:** With more and better education on automation and robotization, the momentum for its adoption and widespread use has increased. Manufacturers such as ABB and ASTI are continually training their equipment and updating their designs to meet current needs and those of their customers.

Learning the principles of robotics and automation has opened the opportunity to be much more efficient and have a greater mastery of the situation by the work teams.

Now that we know their main differences and are aware of the latest trends, are you ready to enter the world of robotization? If so, here are a few questions you can’t help but ask yourself.

- Are we going to have to control the robot in person?
- What movements will it make? How far will it travel?
- Are repetition, precision or both essential?
- Does vision need to be integrated into the robot?

We know these are not easy to answer, but they will help you understand what you need. Keeping in mind the big differences and the market trend, it’s all about getting started.

As Henry Ford said:

“Don’t find the fault, find the remedy”.

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