Case Study

PRODUCTION, DISTRIBUTION & SALES IN INDUSTRY 4.0 – A CASE OF SPAIN

Keywords: *Supply Chain, Production, Automation, Car Sector, Industry 4.0, Software.*

Background to Case Study

The incorporation of Industry 4.0 has meant a very relevant change in the entire production process of companies, but its impact on logistics is decisive. It is a strategic area that brings many benefits if the fourth-generation industrial revolution is implemented on it.

Before Industry 4.0, Production, Distribution and Sales of goods and products was conceived as an internal supply chain, formed by different teams of the same enterprise that were almost completely isolated from each other. Each of the teams worked independently, eventually providing feedback to the rest of the components of the chain, thus answering to the different needs and issues that raised during its activity.

For instance, a common practice of sales departments was to call to the production team in order to know if a certain product, requested by a customer, was or not in stock. This information, crucial to achieve the sale and comfort the client, felt like a gap between the different departments of the same enterprise, thus giving the impression of disorder and lack of coordination and professionality. These gaps were present in other parts of the supply chain, creating delays and loss of profit, which is not desired.

With the arrival of Industry 4.0, however, traditional sales channels are being pushed aside in favour of a much more digital option, where delays and lost profits are largely avoided. Because the products and services driven by this new type of industry are often characterised by greater complexity, a wider range of functionalities and technology specifications and the capacity for greater connectivity. Typically integrated with other systems for greater internal intelligence.

In fact, with this new system, added value is given to distribution processes by being more direct and agile, reducing product delivery times. To this must be added the implementation of technologies such as Big Data, with which the company is able to predict customer consumption habits, facilitating distribution times or stock replenishment.

Moreover, the development of e-commerce has favoured the implementation of this revolution in a company's logistics by being taken entirely online through different platforms which, as mentioned above, add value to the company's overall process and reduce unnecessary costs, resulting in an increase in the company's overall profits.

Summarising, the implementation of new technologies in the logistics process can help companies to improve their economic situation, but it can also provide the added value needed to differentiate themselves from the rest.

Project No. 2019-1-PL01-KA202-064936

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Introduction to the Case Study and it's growth within Industry 4.0.

Many companies have applied Industry 4.0 to these concepts and have adopted software solutions (or even created their own) in order to monitor and control their supply chains, thereby achieving almost immediate responses to requests or emergencies within it. This has enabled some departments to have access to others, thereby greatly increasing efficiency and accuracy in order fulfilment.

For example, it can be made easier for the sales department to have access to stock control, so that stock levels, order volumes and future deliveries can be known to promote, as mentioned above, accuracy and efficiency.
However, several companies are exploring the possibilities of this type of solution, with SEAT being one of the most innovative in Spain, as we will see below.

Connecting a company in its entirety to the cloud improves its reaction time to different needs, thus facilitating the work of its employees. The future of these applications is to become almost fully automated, with AI intelligent enough to react on its own to supply chain needs and emergencies under its control. While this may seem an expensive process, the actual price is not prohibitive for SMEs, which is encouraging a more collaborative mode of manufacturing, as you don't have to go to a specific department but can find out directly by checking the status on a computer. A bonus is that entry-level employees are trained for further increases in the use of technology in a gradual way.

This process of implementing Industry 4.0 has a broader perspective, not only in logistics, but also seeks to maximise the technology that connects all aspects of the company to share information. The aim is, therefore, to create a "Smart Factory" that allows a flow of information in all manufacturing processes that will make it possible to react at any time during the manufacturing process to a possible risk and anticipate it.

When production, distribution and sales are fully integrated in a network where processes are linked with each other, but also with humans, the company's potential along the entire supply chain can be maximised 100%.

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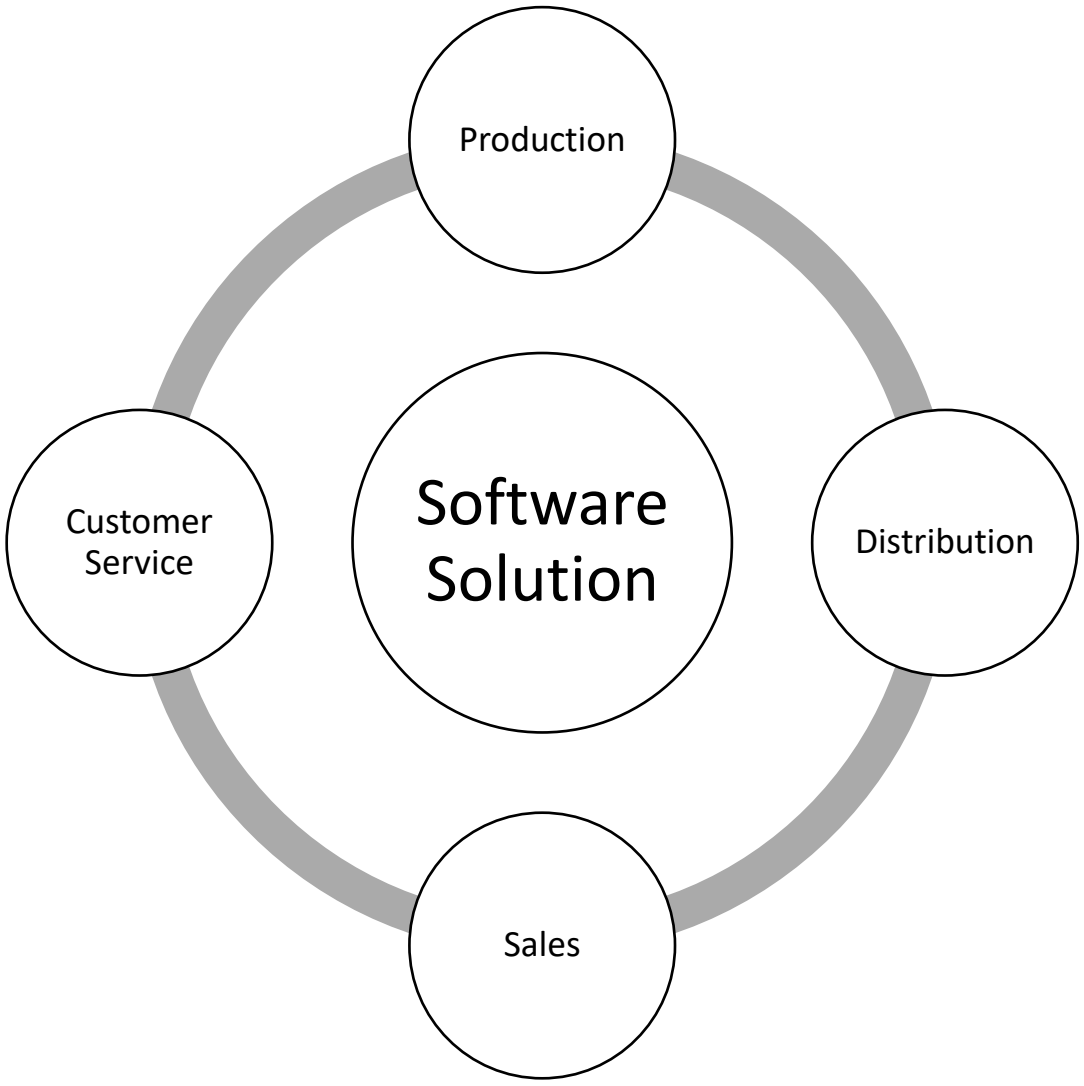
The Case Study and Industry 4.0 Elements: A Pictorial Overview

In the following graph we can see the whole supply chain and the relation that each department of a given company has with each other. Adopting a software solution as a method to supervise, control and manage this supply chain will centralise the needs and solutions of the whole chain, improving time management, reaction capability and control over its needs and eventualities.



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The Element Explored within Industry 4.0 Application.	*SEAT is a Spanish enterprise founded in 1950, dedicated to the design and production of tourism cars. This company has put a lot of efforts into innovation, thus winning the "Smart Business" award, by Business Insider, in 2019, due to its adaptation to new technologies and digitalisation.* *On the of the core organs of SEAT is its plant in Martorell, Spain. In this plant, nearly 16 million pieces are managed daily, with a production of approximately 2.300 vehicles per day. This puzzle of logistics could not be possible without the help of its Control Tower, developed by SEAT's production and logistics team. It consists of a system capable of connecting every subject within the supply chain, even reaching the final customer if, for example, wants a change of colour in its future car, currently being produced.* *The result is an efficient and non-contaminating software solution that, supported by a videowall, is able to condense every piece of data collected by the different departments of the company, providing real time information about production materials, consumption, transport of pieces and other logistic operations. This has replaced the hundreds of phone calls and emails that were conducted before this system in order to control the production and logistics of the company each day.* *"We look to control everything possible, from stocks to events in the supply chain and logistic centers", stated David Castilla, leader of this project. "We have managed to anticipate the needs of the supply chain well in advance. The direct benefit is for the customer, as we will ensure the delivery time by knowing for sure that the parts of his/her car will be at the expected date of manufacture"*
Application Target Audience	*The results of the case-study are intended for use by SMEs, Enterprises and Entrepreneurs.*
Resources Used:	*- "Selling Industry 4.0", by J. van Wyk, P. Brooke and J. Bornstein (Deloitte Insights). Available here.* *- "Manufacturing and Industry 4.0", by HSO. Available here.* *-"SEAT gestiona 16 millones de piezas al día en tiempo real con Control Tower", by Manutención & Almacenaje. Available here.*

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	- "El impacto de la Industria 4.0 en la Logística: 6 avances que ya revolucionan el sector", by D. Caldentey. Available here.
Further Reading:	*- "Supply Chain 4.0 – the next-generation digital supply chain", by K. Alicke, J. Rachor, A. Seyfert. Available here.*

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