



The Digital Supply Chain

BY LUIGI DE BERNARDINI | WED APR 19 2017

Since first developing projects to optimize production management, a shift has occurred in recent years that sees competition not just from manufacturing companies, but the full supply chain. The days of a single company reaching a market leadership position on its own are over, simply because it's not possible to compete alone in the market. And in the supply chain today there's a new fundamental actor that is determining the change: the client. It's not the designer or the inventor any more that creates the market, but the end user, through choices and real-time feedback.

This change introduces several new factors—whether cultural, sociological, habitual or strictly technical. The market today requires speed, flexibility and adaptability, particularly for tailor made solutions. The need for manufacturing companies to differentiate themselves is more important than ever, and there's an opportunity to offer products designed and built for the needs of a single customer.

For this, technology needs to provide the most effective and flexible solutions. Whether mobility, cloud

computing, drones or any number of new developments, technologies have changed customer expectations. Those same technologies become the key elements the supply chain can use to satisfy expectations and be more competitive. New solutions also need to be affordable and competitive.

Innovation comes not from the sophisticated new algorithms that enable analysis of big quantities of data, but rather the possibility of using existing algorithms on tools with computation capabilities that you couldn't imagine until a few years ago. It's not a single element that changes the landscape, but the combination of several elements that exponentially multiply the effects of each one.

The times we live in are certainly exciting and new, but also dangerous for those not ready to adopt new technologies. The ease of use of new tools, as well as their low cost, dramatically reduces the entrance barriers in markets that were previously considered protected. Think about Uber, Airbnb or Amazon. They were able to significantly change, in a very short time, consolidated markets, where apparently there was nothing new to invent—these companies changed the market with entirely new concepts of the supply chain.

The revolutionary element was digitalization of the value chain, which connected all the actors in a quick, efficient, flexible and, most importantly, safe way. It's the Internet of Things (IoT) that has transformed the supply chain; the ability of everything to transmit information and connect and relate to each other.

Big Data and analytics—all the data and information generated by IoT—would be useless without the ability to store and analyze apparently unrelated bits of data. And the exponential growth of the data size makes it impossible to use only manually generated models or algorithms. Artificial intelligence (AI), therefore, is becoming ever more important, providing the ability to autonomously generate models and find correlations in the data that had not been visible before—not only because of the continuous growth of data volumes, but also the continuous transformation of the data sets themselves brought on by new data sources.

The analytical capability is the glue of the supply chain's rings because it allows us to analyze and understand—and sometimes even forecast—situations and behaviors connected to supply and demand that are fundamental to keep the supply chain reactive and competitive.

It brings the concept of just-in-time manufacturing to its perfect state: the transportation delay moves to zero and the only time remaining is production time. Stocks move to zero as well, since it's possible to produce products when they are needed and where they are needed in the requested quantities and variances.

New real and not futuristic landscapes become available. When you imagine products delivered with drones or autonomous vehicles, you might think of Amazon's drones or Google's cars delivering the parcels, but you should consider a less futuristic and more actual example. In Rwanda, there's an already active service to transport and deliver blood bags and medical treatments totally based on autonomous drones. It's a marvelous example of digital transformation of the supply chain, where technology solved a problem that was only a few months ago almost impossible to solve in a country like Rwanda. The incompatibility between transportation costs and the urgency dictated by patient conditions (especially during the rainy season) on one side and the impossibility to store both the blood bags and the medicines locally on the other was determining the end of life for many people.

New central and controlled warehouses were created from where—based on the need of a single patient—a totally customized product could be delivered within a half hour to save a life. The solution was made possible

by combining several new technologies that applied alone would be useless. It was the complete and real-time coordination of all the actors playing in the supply chain through a digital infrastructure that made it possible.

This is an example out of the ordinary schemas, of an unconventional supply chain for sure, but one that has an extraordinary impact. It's exactly for this reason that I believe it can explain, more than others, how abundant are the opportunities offered by the application of the digital technologies to the supply chain.