



The Future of Smart Packaging in Supply Chain Management



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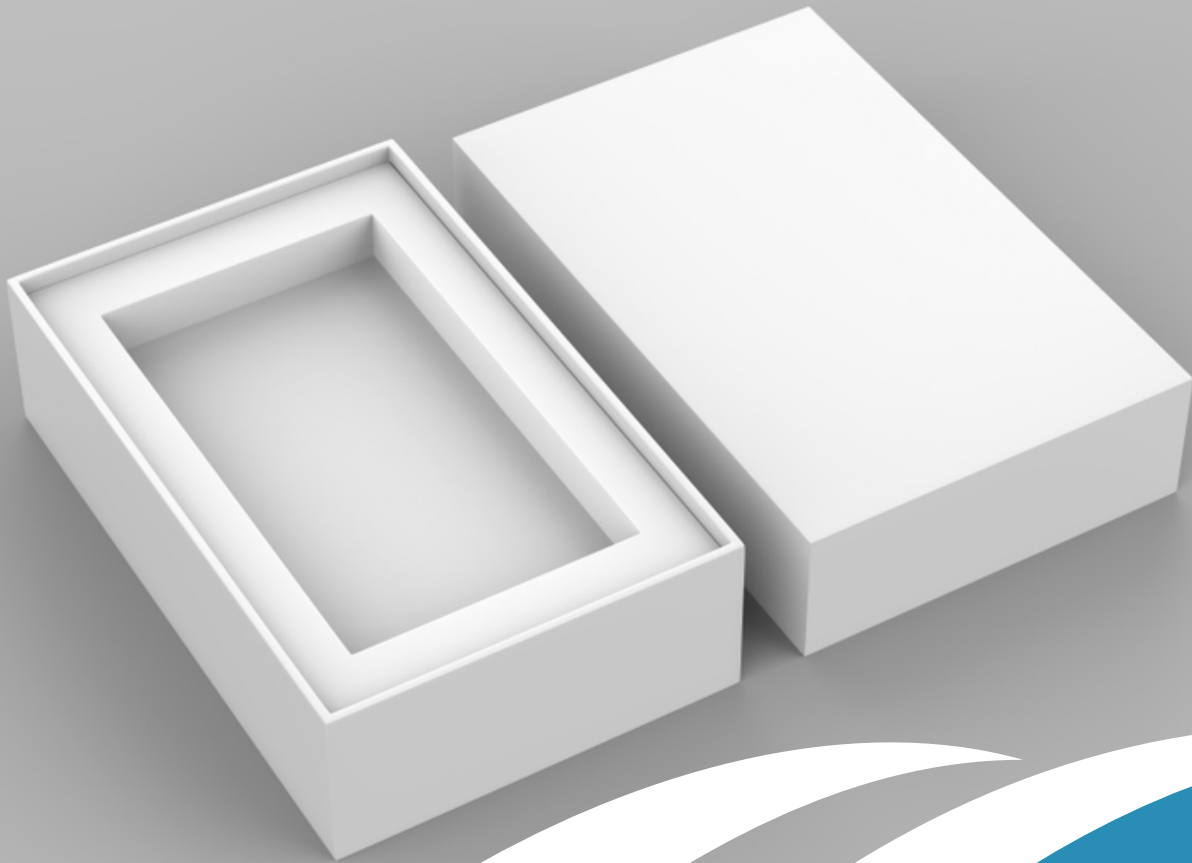
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Introduction

Throughout the last decade, the packaging industry has undergone significant changes - from technological advances to an increased focus on sustainability and digital technologies. Packaging innovation rarely stays the same, and Industry 4.0 has simply increased the speed at which innovations are implemented. Several digital technologies are emerging that can improve the supply chain, such as Big Data, Internet of Things, Cloud, Blockchain and Artificial Intelligence, among others. What unites all these digital technologies is the fact that they offer different incentives, in their own different ways, to further boost supply chain operations. The advantages, challenges and future developments of all these technologies emerge from the point of view supply chain management.

Supply Chain Resource
Cooperative (2017)
defined such
endeavors as follows;

“Supply chain management (SCM) is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains

in the most effective & efficient ways possible. Supply chain activities cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities” [1].

Smart packaging can be categorized as efficient packaging, containing additives that help maintain product quality and provides the customer with additional information on packaged goods. The position of supply chain management in value creation is becoming stronger and more strategic, while different digital technologies contribute towards this growth. Digital technologies have been found to significantly enhance supply chain operations in a number of unique ways.

These technologies create more transparent and efficient supply chains, allowing business leaders to maintain better overall control of their company's operations. By incorporating digital technologies, the companies can significantly increase their efficiency while at the same time reducing costs and increasing customer satisfaction and retention as a result of more reliable and productive supply chains.

Today, organizations are constantly evaluating the functions of supply chain management and digitization to improve business as a whole. It is crucial for companies to innovate on new ways of

[1] Supply Chain Resource Cooperative (2017). What is Supply Chain Management (SCM)?

streamlining their supply chains and optimizing productivity in today's increasingly competitive markets.

Competition has never been higher across all industries, and this transition is rooted in increasing customer power. Digitization causes disruption and allows businesses to rethink how their supply chain is strategized. It requires rapid anticipation, reaction and the ability to scale to ever-changing customer expectations for companies that want to remain competitive in the digital market.

Furthermore, customer expectations are evolving as individualization increases. Digital technologies can provide companies with a highly competitive edge over their customers. Consumers want higher quality requirements in tandem with more personalized orders, and this forces companies to develop new approaches to meet changing needs. Recent online developments, coupled with much more comprehensive orders, have led to an increased focus on service as a result of increasing customer expectations.

Online - facilitated visibility and easier access to a variety of choices about where to shop and what to purchase on-line have further enhanced supply chain competition.

Over the last decade, the industry-wide focus has been on generating new products combined with transformative developments through digital technologies, creating great

opportunities for service and product innovation. Digital technologies have replaced conventional barriers, such as physical store locations, giving customers more flexibility (and therefore control) than ever before. While the advantages of digitizing the supply chain are obvious, it may remain a challenge for companies to innovate accordingly. The gradual shift, which puts the customer at the forefront of everything, has had a profound effect on the way business operates.

How do companies adapt to the pace of technological innovation and its impact on their SupplyChainManagement processes? Industries are often tempted to start experimenting with new digital technologies in the hope of achieving a sustainable improvement in the costs and operation of the supply chain. One of the most important tasks that a company can undertake to support this gradual shift is to ensure that it has implemented the right technology in place.

In recent years, the digitization of the supply chain has been a goal; always on the horizon, but slow to materialize. Many companies see the potential benefits of these digital technologies but struggle with taking the right first step to start their digital supply chain transformation effort [2].

[2] Supply Chain Quarterly (2019). Digital supply chain transformation: Taking the first step.

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There are wide variations in the capacity to develop a digital supply chain. There are differences of opinion as to the position of the supply chain within companies, leading to different strategies and countless of ways of managing the digitalization.

Harvey Nash Group and KPMG (2017), [3] conducted a survey of 4498 Chief Information Officers in 86 countries, and the results showed that 88% of them believed that their companies have yet to fully benefit from their digital strategies. Furthermore, a quarter of companies (25%) have incorporated a Chief Digital Officer: 25% in 2017 compared to 7% in 2014. This indicates that there is a recent move towards the adoption of digital technologies.

Digital technologies are now important tools for maintaining viable partnerships and creating quality networks with other companies and stakeholders, because without them it is almost impossible for companies to succeed or provide adequate services to customers within a competitive digital market. In addition, digital technologies are changing the nature of social collaborations from the point of view of both companies and consumers, and they have become deeply embedded in products and services.

Companies need to further invest in digital technologies and develop their management skills to take full advantage of the benefits leveraged by innovative new solutions. The transformation of supply chains using digital technologies such as the Big Data facilitates the supply chain management process through a more flexible model where information flows in a directional manner. However, the digital supply chain needs to develop a completely different level of competence and skill set.

[3] Harvey Nash/KPMG (2017). Navigating uncertainty

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