

The Future of Digital Procurement and its Benefits in The Global Supply Chain

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Abstract

Companies are striving to improve their management system in a period of economic globalization, where the environment is increasingly competitive and widespread. In this era of industry 4.0, most companies try to be reactive and agile, by implementing new technologies such as artificial intelligence (AI), robotics and internet of things (IoT) in all the supply chains processes.

Procurement is considered as a vital function in supply chain management since it has a direct impact on the savings of the company, and it can provide new opportunities for the value chain to enhance efficiency and effectiveness.

Therefore, while digitalization is the key driver of the fourth industrial revolution, procurement managers need to digitalize this process to drive innovation and ensure the market leadership of their companies.

The main purpose of this paper is to identify the critical role of E-procurement in providing greater flexibility and control over all aspects of the purchasing process. This article is based on a real case study from the food industry, and it aims to bring light to digital transformation in the procurement process and its practical outcomes.

Keywords

Supply Chain, Industry 4.0, Supplier Relationship, Digital transformation, E-procurement

1. Introduction

The company's supply chain management, notably its procurement policy, is a key concern. Indeed, there are several supply-related issues. As a result, the organization must either build a worldwide digital strategy or anticipate these various anomalies.

Digital procurement (DP), involving the automation of the procurement process using e-procurement platforms combined with smart analytical tools such as big data and data mining solutions, has recently emerged.

Procurement must not only examine its strategy but also take a proactive role in creating the company's digital strategy in order to independently shape its position as a vital function. Companies that use digitized procurement (DP) can obtain a competitive advantage by focusing more on their customers and having the necessary agility to meet ever-changing client requirements.

The journey to digital transformation can appear like a leap into the unknown if managers don't have any relevant prior experience. This needs well-considered, disciplined, and forward-looking action, based on that vision of leadership and collaboration which are critical success factors in every digital transformation.

This paper reports a research project that seeks to address the following question:

How can digital procurement liaise and connect business partners, suppliers, and experts across with business units? What factors influence an organization's decision to select the key activities associated with the implementation of a digitally enabled e-procurement platform? And what is the added value of digital transformation in the procurement process?

2. Literature Review

This section of the paper is devoted to highlighting the study's findings based on the information and data gathered as a result of analyzing and reviewing various articles.

Thomson and Singh (2005) explained that e-procurement processes include the deployment and management of buyers and sellers, a digital product catalog, online orders, payment, shipment notifications, logistics, and supply chain management.

Rayport and Jaworski (2016) defined e-Procurement as a B2B e-commerce application based on web functions that allows employers in the procurement department to purchase goods and services while also allowing suppliers to manage and communicate the fulfillment of purchase orders. It includes catalog management, control and approval, receipt and exception handling, as well as financial services and payment processing.

Bill Michel, president of ADR North America and senior vice president of the Institute for Supply Management, is quoted by McCrea (2016) in her article as saying that there are multiple paths for purchasers to better capitalize the web to reduce costs involved with procurement processes. The company can easily and quickly consolidate its supplier base, which will result in significant cost savings. Also, the use of e-auctions, which are particularly effective for commodity products and can save businesses a huge amount of money.

McKinsey & Company (2020) insisted that the future procurement department will be involved in all aspects of the company value chain, from product development through distribution, while also monitoring budgets and expenses, identifying and minimizing supply risk, and ensuring compliance. So, it introduces a new solution with a powerful combination of Orpheus advanced platform technology (Orpheus is an innovator of digital procurement that develops software, founded in Germany in 2005) with McKinsey's industry expertise and content-rich services in digital procurement.

According to DELOITTE (2021), digital procurement is the use of emerging technologies to allow strategic sourcing to be more predictive, transactional purchasing more automated, and supplier management more proactive.

We can conclude that over the years, the procurement functions and spend analytics roles are evolving. With the global economic situation shifting, such as the 4th Industrial Revolution, the localization of value chains, and enhancing customer demands for mass customized products and services. Indeed, firms need to obtain actionable information that can help capture further impact in procurement.

3. Methods

As the following research approach is mainly focusing on an explorative question, the present study is part of this context, it is about digitalizing and optimizing the procurement system of one of the leaders of the food industry in order to improve the performance of the supply chain. As shown in Figure.1, we chose a three-step approach.

First of all, we identify the current situation, determine the main problem, and how it has affected the company's

procurement process. Then, we ought to create a significant issue statement and attempt to get the process in-depth details. A literature review is also required to place the research within the context of existing literature making a case for why the study is needed.

On the Second hand, it is necessary to examine this process to see how it performs by using the relevant baseline measurements. Moreover, visualizing the collected data to identify patterns and narrow down the different hypotheses and theories, to vital potential root causes so we can test and ensure that improvement is centered on them.

Finally, we will explore and suggest actions to solve the different faced problems, evaluate them, and select the ones that have a higher chance of success. Once the digital solution has been implemented, we should think about sustaining these improvements to enhance complementarity via the synthesis of results for convergent and adequate interpretations. This couldn't have been possible without the company's Cluster involvement, through meetings and collaborative workshops. The paper is concluded by an evaluation of the impact of the project and the future research needs and opportunities:

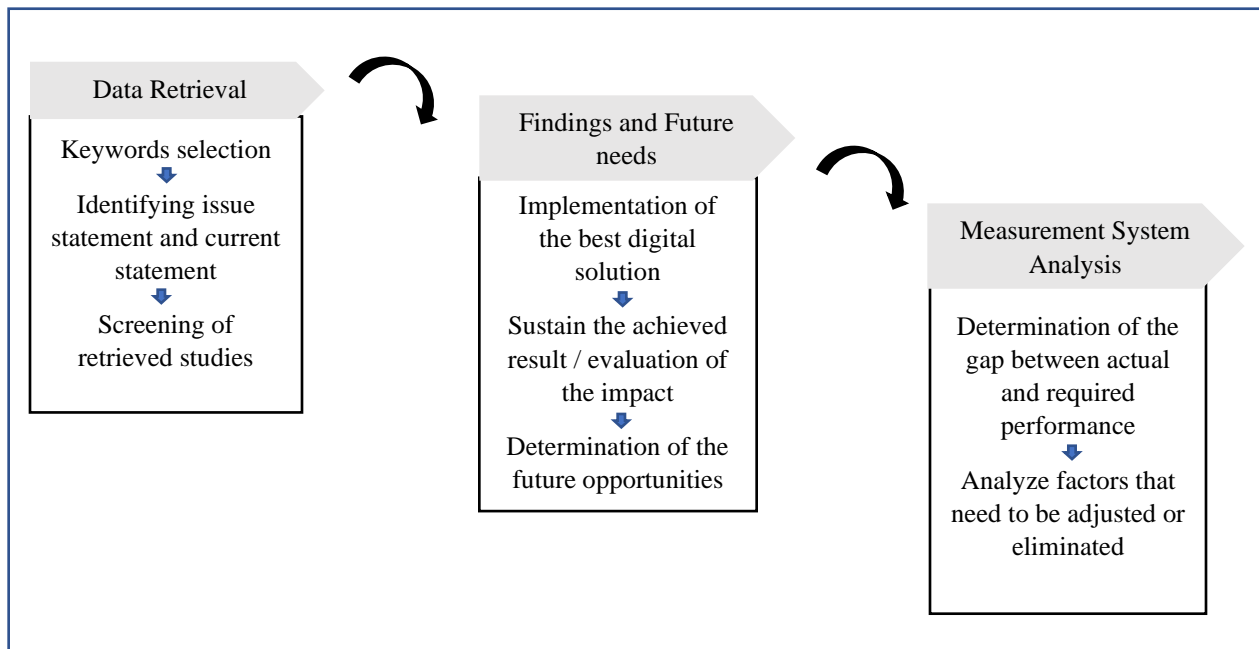


Figure.1: The three-step approach of research

4. Data Collection and discussions

For any industrial company, good purchasing management is essential for ensuring the long-term viability and increasing sales prices on a consistent basis in order to maintain and increase profit margins. Organizations are against a lot of competition. The market of food products is booming, and sales volumes are increasing all the time.

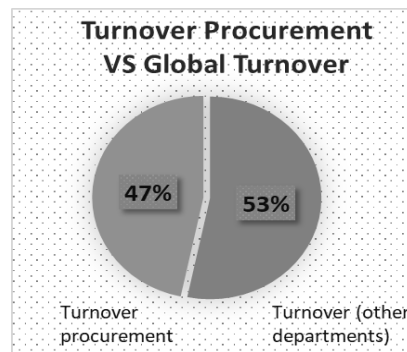


Figure 2: Turnover Procurement VS Total Revenue

This case study is about a market leader in the food industry whose procurement function has a significant strategic impact, accounting more than 47% of the company's total revenue (Figure.2). Especially important when the mission is to prioritize actions aimed at deepening the transformation of externally mobilized resources in order to build a sustainable competitive advantage.

In light of the company's delicate critical situation, procurement must act as a business partner. It must be proactive to rectify the situation and reduce the costs that the company incurs.

Managing the costs of direct or indirect purchases as well as the potential savings that result, is a major competitive challenge for businesses. A mastery that includes a thorough analysis of data, which can be a true performance booster when used correctly. In 2019, indirect spending accounted for 52% of the company's global purchases. By 2020, the percentages have increased by 4% and the total amount of the indirect spend is 56%. (Figure.3)

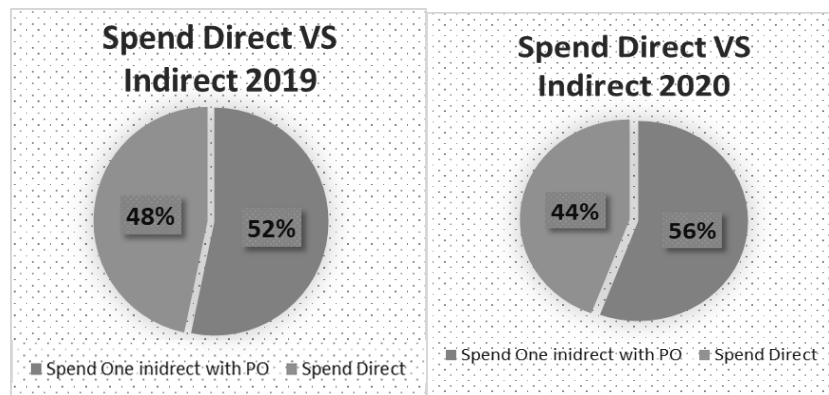


Figure 3: Spend Direct VS Indirect 2019 & 2020

The challenge of the procurement department is to collect, structure, and analyze data related to these purchases in order to make strategic decisions that will allow them to be optimized and significant savings realized.

After gathering data and analyzing it to determine its level of criticism. We met with the Category Managers, most important suppliers, and the Company's procurement coordinator, and we discussed the issues that were discovered.

Each member of this meeting must evaluate the problems based on their likelihood of occurrence and impact. We've decided to put 8 as a threshold. Differently said, if the result exceeds 8, the family of the product faces severe criticism. If the result is less than 8, the problem is not a threat that must be addressed. The notation system range is from 0 to 4 for the likelihood of occurrence as well as the impact.

Aside from the financial challenge of the studied category and information on purchasing risks. We position the

category of indirect purchases in the Kraljic matrix (Figure.4) and come away with the conclusion that it is a strategic category with a high risk.

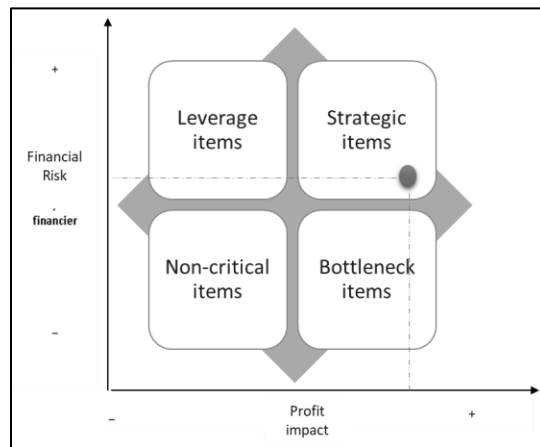


Figure 4: Kraljic Matrix

We've decided to expand even further into this category's subfamilies by analyzing them using an ABC classification to determine the most problematic families. Then, we chose the most critical family "A" in the ABC analysis to see how products are managed and purchased.

The table (Figure.1) below represents a sample of 9 products purchased from the 5 sites of the company:

Table 1: Miss to win - Sample

Product	F1	F2	F3	F4	F5	Miss to Win
P1	325,20	346,88	-	672,08	346,88	390,24
P2	261,96	392,94	120,83	130,98	392,94	695,50
P3	54 114,93	54 114,93	-	108 229,85	-	54 114,92
P4	-	1 691,04	-	1 268,28	2 536,56	1 691,04
P5	1 182,00	4 728,00	-	3 546,00	3 546,00	8 274,00
P6	433,60	-	975,60		867,20	975,60
P7	-	487,80	450,00	1 951,20	1 463,40	2 552,40
P8	3 800,00	15 200,00	7 600,00	3 800,00		15 200,00
P9	3 306,20	6 612,40	-	9 918,60	3 306,20	9 918,60

According to these calculations, the prices of products are not fixed, but rather subject to minor price fluctuations.

We can deduct from the price fluctuation that is not justified from one year to the next and from one site to the next that each site consults the suppliers without coordination with the other sites. We can also see that for each site, each order is dedicated to a specific supplier. As a result, the company does not benefit from the volume effect.

To determine the true loss suffered regarding this strategy, we calculated the loss (miss to win) per article, which represents the profit that could have been realized (by DH).

In Addition, there is also to other problems related to the procurement department:

- Invisibility on the information system:

Sometimes products are not included in the intern system of the company, resulting in a lack of awareness of the status of this family's stocks as well as price variations from one order to the next. This is a non-parametric family based on the company's ERP.

- Delays in delivery:

The causes of delivery delays are numerous. Delivery delays can greatly affect the business negatively. The company needs to act to mitigate this problem. Customer retention is directly related to delivery time. Customers who have a delivery delay while ordering for the first time are less inclined to shop from the same firm again.

5. Proposed Improvements

The solution is to build an E-Procurement Platform. An internal platform made up of several functionalities. The main objective is to manage all the procurement and payment processes related to the suppliers of the company in a single tool.

First of all, this action will allow the company to globalize purchasing, as well as fluid management of the supplier's payments while ensuring the automation of the different interactions between the stakeholders.

The proposed Platform has several features:

- Maintaining a record of all purchasing requests received and approved through well-defined criteria.
- Management of purchased orders, which could be generated automatically after approval.
- A cost-control functionality that uses custom rules to optimize overall spending.
- Accessible customization of profiles, fields, and workflows.
- Efficient supplier management functionalities
- Purchase invoice functionality, which must be easily issued and compatible with multiple correspondences.
- Greater effectiveness and efficiency of procurement procedures
- Administrative simplification

5.1 Supplier relationship

The platform helps the company digitize and increase the reliability of all the processes related to supplier relations: referencing, certification, performance evaluation, and risk management. It develops closer, more agile, and collaborative supplier relationships to generate more value, minimize risk, align the KPIs and achieve the goals through configured dashboards for informed decision-making.

As suppliers are an integral part of success, the platform offers also, a simple referencing process and a fast supplier data collection. Moreover, it allows managing suppliers by listing the specific requirements, whether internal or regulatory, and to have up-to-date, validated, and authenticated information at all times, to improve visibility while reducing risk.

The procurement department will have a centralized repository for easy data access when discovering, importing, and managing suppliers. All supplier information can be collected in a single database powered by data from different internal and external sources.

The company can also integrate its own ERP to consolidate business data stored across a variety of features. Therefore, procurement finance and accounting teams will benefit from easy access to search and review supplier data across the organization.

On the other hand, the solution provides a collaborative space for suppliers to manage communications, update their data and information, and manage their ongoing activities. Differently said, it manages the onboarding and certification management, communication & collaboration calls for tenders, order and shipping, and dematerialization of invoices. The supplier only has to register and log in once to be able to navigate in the different options.

E-invoicing and E-payment are also integrated into the process and represent a real opportunity. It reduces the administrative burden, saves time, reduces the error rate and paper consumption. From a legal point of view,

a structured electronic invoice has the same validity as a paper invoice, it is the source of cost reduction, saving up to 75% of the cost of a paper invoice. In addition, e-payment can add significant advantages in terms of visibility.

5.2 Procurement department

The primary functions of E-Procurement are extensive, providing numerous advantages for a company's day-to-day operations and supply chain activities. This interface is mainly dedicated to the purchasing department in order to simplify the purchasing process and reduce the costs inherent in procurement. Several sections are set up on the platform:

-Management of purchase requests

All the purchase requests launched by internal customers are consolidated in a single table, indicating the Purchase Request (PR) number, the desired item, the corresponding factory/ business unit, and the supplier contract. As a result, the buyer will have visibility on the summary of requests by item. In addition, he will have access to another component to supervise the exchanges between factories.

-Purchasing Performance

Automation is a great way to boost and evaluate procurement efficiency since it plays an important role in the supply chain during an economic crisis. This section will allow the buyer to monitor his performance through several indicators:

- The entity & lift graph: representing the percentage of sub-families purchased monthly.
- The Saving VS Planned chart to highlight the effort made by the buyer during the negotiation.
- The Target VS Treatment chart: representing dwell time, processing time, and target related to the DA treatment chart edited by the platform's algorithm in order to demonstrate the buyer's performance and verify his readiness to exceed its targets and gain in processing time
- Emergency rate processed: Emergency purchases are those unplanned orders which are acquired to prevent the shortage of products/services. This metric is measured with the ratio of emergency purchases to the total number of purchases over a fixed period of time (Number of urgent orders / Total number of orders). It will allow the buyer to quantify the number of urgent orders, and so be able to control the internal collaborator through the setting of a number of urgent orders.
- OTIF (On time In full): this indicator will allow the buyer to know the number of orders processed that meet the quality level desired by the desired quality level with the desired quantity.
- Procurement ROI (Return on Investment) is used to measure the income and cost-effectiveness of a procurement investment. This metric is suitable for internal analysis.

$$\text{Procurement ROI} = \text{Annual cost savings} / \text{Annual procurement cost}$$

In the past, the company worked with several suppliers, without any follow-up or contract. Now, with a digital rationalization solution implemented in the platform, it will be able to optimize its costs through a framework purchase contract. The organization will commit to one or two suppliers a set of products following specific characteristics, and a price list in order to avoid any price variation.

Having a rationalized supplier panel requires the implementation of a framework, a strategy that perfectly meets the company's goal: Centralization.

5.3 Internal customer

It allows having a permanent follow-up of the physical and digital reception of goods in order to control the responsiveness of this internal customer. In addition, through this interface, the procurement department will have a summary of the number of canceled/modified orders as well as the total number of POs on a monthly basis.

6. Validation

The importance of digital rationalization of the supplier panel is based on cooperation through the ability of the various stakeholders to accept and adapt to changes in the purchasing process. On the other hand, it is founded on the competition of identified suppliers.

Consequently, by reducing the supplier panel for the concerned products, the total amount of these purchases will be spread over a very small number of suppliers, which will give the buyer negotiating power that will generally lead to a considerable reduction in prices.

Over and above the financial gains, rationalizing the supplier panel will enable the company's buyers to better manage their daily workload so that they can improve their productivity. In addition, optimizing the panel will also lead suppliers to increase their commitment and involvement, through active participation in creativity, by improving product quality and the punctuality of deliveries, with the aim of maintaining commercial relations with the company.

The proposed platform will be a real performance lever for the Purchasing Department of the company's Procurement Department, and will in particular encourage:

- The optimization of the procurement process due to digitalization and automation, which will reduce the processing time for purchase requests
- Improved visibility and control of the flow by consolidating the purchase requests of the 5 plants in the country
- Reducing management costs due to the multiplicity of suppliers on the panel
- Having the best rate conditions due to the volume effect.
- Securing purchases
- To guarantee a better follow-up of quality and delivery time
- Lighter operational load for the procurement team
- Increasing the skills of the purchasing team by freeing them from the majority of manual and time-consuming tasks so that they can concentrate on higher value-added missions
- Improving the performance and competitiveness of company's buyers through the various KPI's
- Increasing visibility and transparency over the spending
- Putting productivity back at the heart of the company's operations
- Internal staff more committed and involved
- At the strategic level, the company will be able to improve its image and reputation to the market mainly in terms of risk management and supplier relationship.
- After sending the PO (Purchase order), suppliers continue to contact the buyer in order to track the progress of their invoices. This operation consumes 20% of each buyer's time every day (as reported by the purchasing department). Through the E-payment system, the supplier will be able to check the status of his invoice at any time, resulting in a 20% of time savings for each buyer. (Table.2)

Table 2: Total annual gain after implementing the platform

Category Manager	Number of working hours per year	Daily gain (hours)	Annual gain (hours)	Total annual gain in Hours
1	2 112	8	2 112	5 069 H
2				
3				
4				
5				
Buyers	Number of working hours per year	Daily gain (hours)	Annual gain (hours)	
1	2 112	11	2 957	
2				
3				
4				
5				
6				
7				

In brief, the platform will focus on three key areas:

Efficacy: The platform concept promotes more effective and long-term coordination between category management and internal users. Through collaboration on a virtual platform, the fragmented processes of geographically separated teams are merged. This includes, for example, the use of an integrated online survey tool.

Efficiency: A variety of communication channels, such as a task manager, chat functionality, and integrated approval processes, support and encourage collaboration among all stakeholders in all categories. Standardized forms, organized questionnaires, and automated results presentation free up time for category managers to focus on more value-adding activities.

Strategy: By introducing the platform, procurement can position itself as a digital leader inside the company. The interfaces and massive, converging data volumes have been created to be as efficient as possible in order to establish procurement as a sustainable value generator.

7. Conclusion

This paper has presented the findings of a research on the future of digital procurement and its benefits in the global supply chain, based on a real case study of one of the leading companies of the food industry.

First of all, we started by identifying the issue and the current situation, to frame the retrieved studies and liaise them to the company's procurement department. Then, choosing the relevant digital solution to increase the profitability of the department and evaluating the impact. Finally, determining the gap between actual and required performance and analyzing factors that need to be adjusted.

An Industry Revolution is typically driven by revolutionary technological developments that have resulted in significant developments in how the industry function. These developments have an economic and cultural impact. Some are purposeful and beneficial, while others are unintentional and undesirable. Industry 4.0, like its predecessors, is driven by technology.

In this intriguing field, our findings are just a starting point for future research such as:

- Procurement and the Industry 5.0: Industry fifth revolution is primarily about linking equipment and about human-machine cooperation on the production floor of lists for the benefits of human-machine collaboration.
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It will create new opportunities for several functions of the supply chain, but how can this new revolution develop the actual digital procurement related to the fourth revolution?

- The future of procurement technology heralds innovative cloud solutions that will not only change procurement as we recognize it but will also pave the way for all developing technologies. How can companies maximize their procurement budget and increase the value of their current legacy systems at cost-effective prices?
- What are the risks and opportunities associated with the new technologies and how can leaders advance the digital maturity of the supply chain?

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