THE IMPACTS OF THE COVID-19 CRISIS ON SUSTAINABLE PRACTICES IN THE SUPPLY CHAIN

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INTRODUCTION

Sustainable practices in the supply chain are an increasingly dominant subject for companies trying to balance their triple bottom line with a growing interest, for the environmental aspect. The unexpected Covid-19 crisis also belongs to the concerns of sustainable development . Even though the exact origins of the pandemic are not yet known, the social, economic and environmental consequences are numerous. The pandemic has highlighted the limits of our highly connected and globalized economies and has impacted supply chains throughout the world. When companies are facing raw materials scarcity, others see their products over-stocked. As a consequence, both situations have the same consequences in jeopardising their business.

Based on this reflection, we have defined the subject of our white paper which consists in determining whether the sustainable practices of the supply chain will change, continue or even be strengthened in the face of events related to the health crisis.

This issue is at the heart of current problematic concerns. 28 students in apprenticeship have participated in the drafting of this White Paper. First of all, they carried out a documentary search, followed by an investigation in their company. They have analysed the corporate visions and discussed about possible solutions to adapt to the crisis.

The purpose of this white paper is to provide insights on the impact of Covid-19 on sustainable supply chain practices. We (students and teachers) have identified research papers and professional articles showing evidence on the consequences of the pandemic to understand how businesses have adapted to the situation. Although, economic and social concerns will be part of our study, we will focus on sustainable-environmental practices.

Also, our aim is to demonstrate whether the pandemic will have damaging and irreversible consequences on sustainable supply chain activities or whether it will raise awareness and force companies to adopt more virtuous practices.

SUPPLY CHAIN

Supply chain can be defined as a global network organised to deliver products or / and services from raw materials to final end customers organised through a financial, physical and information flow. Supply chain management encompasses the planning and coordination of all activities involved from the development, the sourcing to the distribution of products and / or services to the final customers. This paper presents 6 different activities of the supply chain :

- **Sourcing**: represents the identification, the qualification and management of suppliers, this activity requires an accurate definition of the needs in order to find competent suppliers fit to supply.
- **Storage**: includes warehousing, inventory management, materials handling and order fulfilment.
- **Transport**: describes the different means of inbound and outbound transportation that can be operated by third party logistic providers or with the company's vehicles which require fleet management.
- **Packaging** is integrated to the manufacturing function in order to protect, facilitate transportation usage and to provide information or promote goods.
- **Reverse logistic** is related to the backward leg of the transport used to return products to the manufacturer or any other party in order to reuse or recycle the materials and avoid waste.
- **Distribution** defines the different physical, digital or combined channels that can be used to deliver products to the final customer.

All these activities involve strategic and operational decisions to run a smooth supply chain, while Logistics consists in the management of the supply chain, coordinating, planning and executing forward and backward flows of goods and information between the different actors in order to meet customers' requirements.

SUSTAINABILITY

Sustainable development has been defined in the Bruntland report as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. More recently, the UN Sustainable Development Goals address the global challenges related to social and economic issues such as poverty, hunger, health, inequality, peace, and justice but also environmental concerns such as climate change, environmental degradation.

In this white paper, even though we talk about sustainability, we focus on environmental impacts including climate change, resources consumption, pollution, desertification, deforestation and loss of biodiversity.

SUSTAINABLE PRACTICES IN THE SUPPLY CHAIN

External stakeholders' pressures push organisations to adopt more sustainable practices all along their supply chain. Starting from local sourcing to local distribution network, using greener means of transportation to reducing packaging, operating in a circular economy are some illustrations of how companies tackle environmental impacts. A sustainable supply chain also helps improve productivity and efficiency of their buildings, their vehicles, machinery by using less resources and reduce costs at the same time.

Sustainable practices need to involve all stakeholders not only internal actors. Implementing a sustainable strategy in the supply chain requires to identify stakeholders' expectation and/ or measure environmental impacts throughout the supply chain and finally take appropriate actions.

Green practices contribute to supply chain resilience by fostering a more local and circular economy. Corporate Social Responsibility (CSR) leads companies to identify, assess and prevent their environmental risks and develop contingency plan to mitigate them.

We can then argue that organisations with a more sustainable supply chain may have been more ready to face the Covid-19 crisis.

COVID-19 CRISIS

The pandemic crisis has produced shocks throughout economies and societies around the world. Government responses induced to shut down non-essential activities, close schools, cancel social events, require social distancing and foster remote working. At the beginning of the crisis, many customers adopted an erratic behaviours which led to supply chain disruptions for some specific goods such as flour, paper toilet…on the opposite side, stocks of other products considered to be non-essential (fashion, cosmetics…) were increasing.

The Covid-19 pandemic represents one of the most significant social changes in modern history. It has a strong impact on corporate social responsibility (CSR). The crisis has induced positive environmental short-term impact such as the reduction of CO_2 emissions due to the lockdown but also negative impacts such as the production of hazardous waste with masks and covid tests. However we can wonder if those consequences will end or if it is already set to have long-lasting profound changes.

METHODOLOGY OF THE SURVEY

To explore the topic "impacts of the COVID-19 crisis on sustainable practices in the supply chain", a survey of 28 companies from different industries of the private sector has been conducted, The study considers their strategy before and during the crisis in order to find out whether they will continue applying the same practices.

The questionnaire consists in a set of **36 questions** organised around the **6 activities** of the supply chain : **sourcing, storage, transport, packaging, reverse logistic and distribution**.

The respondents belong to a wide variety of sectors, the most represented are the telecoms, trading and logistics sector. They have been interviewed in April 2021. Most of them are sales director.

Partie 1

OVERVIEW

A. SOURCING

Because of the pandemic, companies have had to rethink their business model to adapt and survive to the pandemic.

Due to the lack of incomes and economic instability, lowering costs, developing a responsible sourcing, and reducing energy consumption to save money and support their business have been key points of action throughout the branches of the supply chain during the pandemic[1]. Indeed, actions have been put in place to counterbalance the negative impacts that the crisis has had on the sourcing process[2].

Companies have had to abide to a new level of engagement with their supplies in order to ensure that their supply chain continued operating in a timely and efficient manner.

Of course, this also called for some form of simplification in the process. Companies and suppliers had to simplify their compliances in times of Covid simply because they couldn't go through all the processes that normally happen and because time was at the essence.

Moreover, Covid has had a huge impact on companies' finances: they have had to secure and protect their liquidities by requiring timely payments for each invoice and to redirect rmoney into their supply chain department to sustain the blow that many companies have suffered.

Communication is key and the sourcing department is no different when it comes to sharing information. Industry Professionals have understood that in times of great upheaval, internal and external communication needed to be fully operational. For international companies, this meant checking that local, national, and international actors had the right information at the right time in order to be ready to answer any new change in the demand, the regulation and the delays that came with the pandemic.

Lastly, companies often had to advocate and negotiate with public authorities to secure their own supply chain. Depending on the country or continent and the way the pandemic was being managed locally, companies have sought different solutions and in some cases, they have had to change suppliers when a direct path to their usual supplier would be blocked by national or international law.

According to us, these measures were put in place to meet several expectations for all sectors.

First, for the workers and to guarantee their safety from start to finish. As far as the sourcing department is concerned, this meant monitoring the process extensively to avoid any danger coming from the outside and making sure that suppliers would follow protocol and comply with the companys' health rules..

[1] *BERG Achim, HAUG Lara HEDRICH Saskia & MAGNUS Karl-Hendrik, Time for change, how to use the crisis to make fashion sourcing more agile and sustainable*
[2] *WESTFALL Mark, Ethical and sustainable sourcing during covid-19*

Secondly, despite Covid, the rise in CSR solutions have pushed companies to require from their suppliers to maintain the pre-Covid agreed contractual environmental standards to avoid any scandal and preserve their image and integrity.

Now that companies are starting to see the light at the end of the tunnel, they are going to face a new challenge: recover from the pandemic. To do so, many of them have shifted from a human-interaction-based work model to more and more automation to limit the spread of the virus. They have also started to re-localize their production by building local warehouses and choosing fair price shops[3]. With the current situation and its problems, companies which used to rely on global sourcing have sometimes asked themselves if it is still relevant for them now.

Before making a decision, these companies need to consider the origin of their suppliers and above all the full costs for a global sourcing. Global sourcing is a process to purchase goods or services from the international market. It means that the company has chosen to procure its goods at an international level and not at a national or regional level for strategic reasons because they have global operations. When we talk about sustainable sourcing it refers to the integration of social, ethical, and environmental performance factors into the process of selecting suppliers. Of course, these two concepts can be combined by working with suppliers who integrate sustainable processes in their line of work.

The reality is that the bigger the company is, the less they have had to change their global sourcing, but it has brought them to rethink their model, nonetheless. The Agro-food industry, for instance, has been massively impacted by COVID and has several times faced shortages throughout the world in countries and areas where this sector lacked anticipation, adaptation and too few local suppliers to answer quickly to local issues and needs.

A mistake that brings forth the flaws in sectors which rely mainly on global sourcing and do not diversify this key element of the supply chain which ultimately disrupts the whole chain up to the consumer[4]. This does not only have an impact on the consumer, but it also challenges the supply chain reliability. When sourcing and procurement functions are facing demand imbalances leading to inventory challenges, late deliveries follow, and it questions the whole system on which a single-source-supplier company is based. Companies that used to base their sourcing strategy on single sourcing might face the greatest risks during Covid because they would rely entirely on one supplier. If this supplier was impacted during the pandemic, then the company would be left incapacitated and unable to keep operating correctly and meet its clients' demands. With the pandemic, many companies have had to find new suppliers and sometimes closer suppliers and multiply their suppliers to ensure that if one were to shut down, others would take over.

Therefore, these changes within the supply chain happen at a time where a global supply chain has shown lopholes during a global health crisis. First, because there are no consideration of local actors and socio-economic factors and second, many suppliers are emerging but, in many cases, they do not play fair .

Because of these past failures, many voices arise within the supply chain sector to take the needs of the moment into account from now on and choose more local countries, like France and sometimes even regions, because consumers would, therefore, have less difficulties understanding the logistics and processes of the products they consume, and a national, or local supply chain would be much easier to manage whenever a crisis occurs.

Today, most industries are in the recovery phase and it is vital to take into the Covid-19 crisis experience to revamp sourcing and procurement functions. Key points have been identified to help structure a better recovery for companies all around the world:

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[3] *WESTFALL Mark, Ethical and sustainable sourcing during covid-19*
[4] *GERRITSEN Thijs Global Sourcing in times of COVID-19: Commodities and Benefits*

- The first one is to ensure security of supply from existing suppliers and give priority to achieving visibility in the immediate and extended supply network in order to gain a better overview and to respond rapidly to the unexpected.
- The second one is that companies need to stay close to their customers in order to identify changing demand patterns that might have taken place during the pandemic and affect the way people will buy, invest, and consume in the future. By communicating with them and analysing analyzing possible new needs, they will stay ahead of the tide and respond accordingly and avoid losing touch with their market demands.
- Then, rethink the way companies used to work and revise the operating model to make the procurement function a proactive business partner. Rebalance stock levels and reassess category strategies to align with post COVID supply chain planning.
- Finally, create a future-proof procurement function built in resilience by investing in risk management capabilities and digital procurement tools[5].

B. STORAGE

Storage is the process of keeping commodities in excellent condition from the moment they are manufactured or purchased until they are used. For the most part, most people think of warehousing as just holding things, but it really includes inbound storage activities as well as outgoing packing and shipping operations.

The action of storing things in warehouses and logistics facilities is known as storage. Its job is to keep a consistent supply of commodities on the market in order to bridge the time gap between producers and consumers. It also contributes to the preservation of product quality and value in warehouses and logistics hubs[6].

Storage and stock issues related to the global pandemic are various.

Production, construction (storage facilities and retail environments), and manufacturing are all affected by energy consumption challenges (agricultural equipment & refrigeration equipment).

In terms of CSR's political economy COVID-19 has re-defined what an organization can do to ensure social stability through employee healthcare, development, and stakeholder engagement.

Just-in-time supply chains are in disarray as a result of the COVID19 pandemic, especially for companies that subcontract their output overseas. The technology, manufacturing, and automotive sectors are the most affected, with European and American companies subcontracting these industries to the Chinese market.

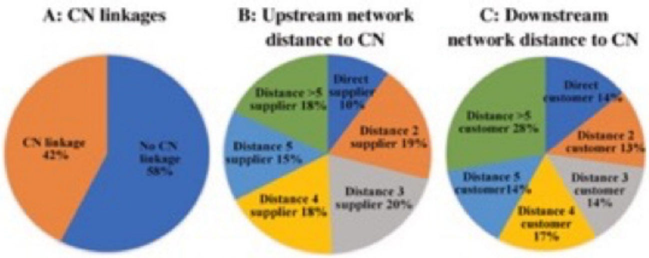


Chart 5. Supply chain linkages with China ('CN'), among non-CN firms.

[5] RAJAL Marc & KUTZNER Marcus, *Sourcing & Procurement Response to COVID-19*

[6] *« Storage and Cargo Handling | Role of Logistics | Barcode Solutions for Logistics | KEYENCE America ».*

The pandemic has not only stopped production in China, it has also stopped the supply of raw material, it is necessary to take into account that China is the first exporter of raw material in the world (especially steel).

For certain types of metals, China is the sole global supplier.

As a result of the Covid-19 pandemic, the manufacturing infrastructure is not as effective as possible. The supply chain sector was led to reinvent the company and to produce more work nearer to the company. However, because of the increased cost of production, this approach may increase the price of the products and cannot satisfy customer requests[7].

It could be difficult to move output from China to other countries because they are not equally infrastructure-friendly and as accessible as China is.

Adaptations and conditions may influence the recovery and long-term effect of the pandemic on logistics[8]. Logistics was in the middle of a technology-based revolution. Companies with strong digital capacity to provide visibility/traceability of freight and to do business online are advantageous. The prospects for recovery differ by sub-sector, region.

Companies have to make permanent social distance improvements in your warehouse to protect employees and company, such as[9]:

- Designate job areas of 6 feet
- Splitting separate workstations
- Simple traffic flow implement.
- Use signals and visual information.
- Change the strategy of choosing.
- Integrate a sanitary tool plant.
- Create a consolidation order «press free.»
- Implement distribution with zero contact.
- Take into consideration incredible changes.
- Strategically, timetable changes

Take an assessment of current operations and prioritize the areas with the highest risk first. Automated storage and retrieval systems should help facility remain compliant for the future.

In the future, the green logistics will be a must in the automated storage. All sustainable policies and initiatives undertaken in industry to decrease impacts on the environment are referred to as green or sustainable logistics. This idea has an impact on the way operations and structure are set up, as well as transportation methods, equipment, distribution and storage of items.

In the past, industry paid little consideration to the environmental impact it may have. With the growth of green logistics, warehouse managers now have to strike the appropriate balance between economic and energy considerations.

The measures of logistics operations' carbon footprint can be applied to track companies' impacts. One of the most commonly used techniques for calculating a centre's energy usage and greenhouse gas emissions is the international standard UNE-EN 16258:2013.

A further time in food supply chain and food industry was created by a pandemic of the COVID-19. Right now, there is a low risk of disease but switching to a post-lock-down level would be more dependent on biological devices being improved. The procurement of vegetables and foodstuffs, one of the key health sectors, is vital to halting the food shortage and reducing the adverse impact of the crisis on the global economy. There will be numerical and mathematical approaches to rigorous investigations to identify problems in the food supply chain.

[7] *Shih, Willy C. « Global Supply Chains in a Post-Pandemic World ». Harvard Business Review, 1 September 2020.*

[8] *"The Impact of COVID-19 on Logistic".*

[9] *Tarr, Chelsea. « 10 Social Distancing Strategies for Your Warehouse | COVID-19 ».*

In the world industry of warehousing and storage the global growth rate (CAGR) of -0.1% could drop from $451.1 billion in 2019 to $450.7 billion in 2020. The fall is partly due to the economic downturn across countries and the steps to curb the COVID-19 outbreak[10].

This will then rebound and rise at 10% CAGR by 2021, to 582.9 billion dollars by 2023. The demand is anticipated. It includes the size of the market, the impact of the Covid-19 virus and forecasting its recovery. It covers the impact and recovery trajectory for all regions, key developed countries and major emerging markets. It analyses GDP proportion, expenditure per capita, warehousing and storage indicators comparison. The trends and strategies section suggest how companies can grow as the market recovers.

The energy storage will be key to overcome the Covid-19 crisis. The correct interpretation is that industrial and technological development must accompany climate change. In this sense, the world economic forum recommends using part of the crisis recovery funds to promote capacities in **clean energy, energy storage, electric vehicles and new business models based on digitalization**. These are four essential levers to be considered for economic and sustainable recovery.

We are facing an enormous challenge; the challenge of emerging stronger from a double crisis, the climate crisis, and the COVID-19 crisis. The experts agree that to recover employment and competitiveness, we must focus efforts on critical technological developments such as energy storage. To this end, it will be imperative to strengthen support policies and instruments for countries and regions, the decisive commitment of the business sector, and the tireless work of researchers and technologists in developing disruptive solutions that are easy to implement and at reasonable costs. To conclude we can say that the concept of sustainability in the storage had changed with the Covid-19 Crisis. Company are more involved and engaged to put more sustainable concepts to their storage.

C. PACKAGING

Like any other field, we can notice that the world of transportation has undergone huge changes due to the health crisis that occurred in March 2020.

First of all, we notice important changes in the online buying behavior of consumers[11]. Indeed, this can be compared to the «Christmas effect» or «Coronavirus effect», where changes in people's routines and practices in response to a crisis has created a «Christmas effect» that changes the desirability of some emerging innovations and sustainability transitions[12].

Changing consumption practices, as a result of an acceleration of on-line purchases and take-away sales in local stores, have led to a rise in the number of surpluses, especially plastic and cardboard.

In response to the health measures, the main players focused on customizing the packaging of the products, which led to an increased use of plastic.

Strengthening the safety rules has benefited the players in the packaging industry to a large extent. Used to avoid direct contact, packaging appears as an essential link in combating the spread of the virus.

In fact, with the health crisis, packaging is back on all foods. From an «ecological» point of view it is quite alarming because studies show that many people have changed their mind before and after the Covid. Whereas before the crisis 52% of consumers preferred to buy cereals in bulk, after the crisis they are only 34%.

[10] *« Impact of COVID-19 on the Warehousing & Storage Industry Featuring APL, DHL, Genco, Kuehne+Nagel and Mitsubishi Logistics - ResearchAndMarkets.Com », 3 juin 2020.*

[11] *HE, Hongwei, HARRIS, Lloyd, 2020*

[12] *K. SOVACOOL, Benjamin, FURSZYFER DEL RIO, Dylan, GRIFFITHS, Steve, 2020*

On the supplier and producer side, there has also been a shift in the process of what is needed to protect against the virus. This improvement in the image of plastic will benefit plastic packaging manufacturers who are regularly criticized for their environmental impact and must deal with increasingly constrained customers budgets. The Covid crisis imposes to companies to review the way they are using packaging and delay investment and efforts on CSR actions. The need of protection against the virus increases plastic and cardboard uses and reduces innovation and the integration of more expensive recyclable materials.

To reduce environmental impact of the health crisis, solutions obviously being put in place and new business models are emerging. Initially, the theory of the circular economy is evoked, based on three principles:

- Eliminate waste
- Conserve products and materials in use
- Regenerate natural systems

The European Commission published the Circular Economy Action Plan 2.0 as a cornerstone of the European Green Deal in March 2020. In parallel, we saw more and more packaging for recycling in formats and applications which are traditionally hard to recycle. In June, the CEFLEX consortium published its guidelines on 'Designing for a Circular Economy' in the crucial arena of flexible companies. The industry has meanwhile extended the functional limits of recyclable packaging with a set of product launches, from mono-polyolefin films to barrier paper that face increasingly demanding applications.

Reducing overdependence on other producing countries for essential goods represents a real opportunity for the post-Covid-19 circular economy[13].

Companies have the opportunity to move towards a more authentic CSR to address social and environmental challenges.

In addition, and as briefly explained above, new models are emerging. However, they will have to be in agreement with all the links of the supply chain so that the change is progressive. Today, for citizens, several measures have been put in place, such as the simplification of recycling. This practice would allow better sorting, thus avoiding errors, especially in the sorting of plastic.

On January 1, 2021, there are 35 million French people who can sort all their packaging. Nevertheless, even today, many packaging are still complicated or impossible to recycle. Therefore, several research projects are being conducted to make them recyclable and reduce their presence when possible.

It is shown here that packaging adapts to new modes of consumption (nomadism for example) and to new distribution channels, so being able to consume a product on a picnic or in the picnic or in a schoolyard has become a consumption habit (food products) that the packaging of food packaging of food products, it is the same for beauty products (lipsticks, mascaras etc.) whose packing is unavoidable in the application of the product. Indeed, the consumption of these products can only be done through specific packaging related to packaging, vacuum or modified environment.

Besides, the use of packaging is difficult to get rid of completely, for example in the medical world, where products must be sterilized and before each use are plasticized for each new patient, or in the world of construction. When the construction site is delivered, there is packaging such as plastic that covers such product to preserve the structure.

In a legislative context, law provides for the end of the promotion of plastic packaging for single use by the end

[13] *11 Autors, 2020*

of 2040. In France Law n° 2020-105 dated from February 10th 2020 was edicted against waste and for circular economy (Loi AGEC). To reach this objective of massive reduction and reuse, a decree will be established:

- **5%** of reused packaging placed on the market in France in 2023
- **10%** of reused packaging placed on the market in France in 2027

It sets a target of reducing the number of single-use plastic bottles by **50%** by 2030

D. TRANSPORT

By definition, transport is the act or manner of carrying something from point A to point B. We can give the example of transport of goods. In the supply chain system, transport is the link that connects all the stakeholders. It is a decisive element that can influence cost, time and quality of the product concerned.

The transport sector is responsible for 23% of the world's greenhouse gas emissions through the burning of fossil fuels. Of all greenhouse gas emissions, road transport accounts for a lion's share, 75% to be precise, and this trend is expected to increase in the future if it continues unabated. All this puts a lot of pressure on national governments to develop policies to reduce greenhouse gas emissions as well as the demand for oil. More generally, it is the entire transport sector that needs to evolve. We see the development of ecological public transport, bicycle, more environmentally friendly modes of transportation. Despite being still more expensive than conventionally fuelled vehicles, alternative fuelled vehicles seem to be finally on the rise: battery electric, hybrid, Fuel cell individual cars; electric, NGV or hydrogen trucks for example. More efficient uses are also promoted: car-sharing, optimised truck load and shared truck, autonomous trucks (platooning).
Covid has affected transport in all its forms : air freight, sea transportation, rail transportation and urban transportation.

Each transport before Covid-19 had few sanitary guidelines. The sanitary standards were dependent on the mode of transport but also on the country in which they were applied. We can say that China, and Asia in general, were better prepared than the USA and Europe for this health crisis. And in agreement with this information, the story shows that the USA and many countries of Europe, including Italy and Spain, have suffered more seriously than other countries from this pandemic.

Researchers have looked into whether there is a link between this low level of preparedness for any health crisis and the number of cases and deaths caused by the disease.

Covid may have changed our way of transportation. Following the well-known path of economic development, as a sign of success, in China people are taking more cars. In Europe, under environmental pressure and awareness rising, the share of walking, human or electric-powered two-wheels is increasing.[14] The pandemic has changed our habits and allowed trends to grow: online shopping, online services (government services, bank services). The way we consume has also changed with more home delivery services. During the first lockdown, transportation experienced an historic decrease, even up to 90% for some airlines transportation companies.[15]

Regarding road transportation of goods, despite a downfall of 18% in volumes at the beginning of the crisis, it kept up through the pandemic. To do so it had to do some tariffs cuts.[16]
Nevertheless, positive effects were visible almost immediately after the lockdown. For example, the CO2 output from transportation fell about 40%.
But after the lockdown, we saw a rise in commercial transportation as we saw a rise of 10%.[17] So in order to

[14] https://www.itf-oecd.org/sites/default/files/covid-19-transport-compendium.pdf
[15] https://www.iea.org/articles/changes-in-transport-behaviour-during-the-covid-19-crisis
[16] https://www.actu-transport-logistique.fr/routier/2020-une-annee-nuancee-dans-les-transports-633536.php
[17] https://unctad.org/fr/news/la-reprise-du-commerce-mondial-apres-la-covid-19-atteint-un-niveau-record

really reduce CO2 emission, states need a prepared plan to cover many sectors and not just transportation. The Covid-19 have changed all the habits of each company. The situation in Europe and America are approximately the same. The impact of the Covid-19 has been huge for the companies. Many of them have shut down or lost many employees. However, for the other regions like Asia and in Africa, the impact depends on the countries. Some countries take the Covid-19 seriously from the beginning, so they have low impact on their transport. From a few months now, the situation is getting better in Europe and America and even around the world thanks to vaccination. However, the countries are still on alert.

E. REVERSE LOGISTIC

«Reverse logistics» is defined as «all efficient processes for planning, implementing and controlling the flow of raw materials, manufacturing assets, finished products and information relating to this flow, both upstream and downstream, in order to satisfy the end customer / consumer».[18] "A Reverse Logistics Network Model for Handling Returned Products" due to the emergence of e-commerce and the proliferation of liberal return policies, product returns have become daily routines for many companies Additionally, it's a legal obligation for every company who distribute product to have a return policy. Considering the significant impact of product returns on the company's bottom line, a growing number of companies have attempted to streamline the reverse logistics process. Products are usually returned to initial collection points (ICPs) in small quantities and thus increase the unit shipping cost due to lack of freight discount opportunities. One way to address this issue is to aggregate the returned products into a larger shipment.

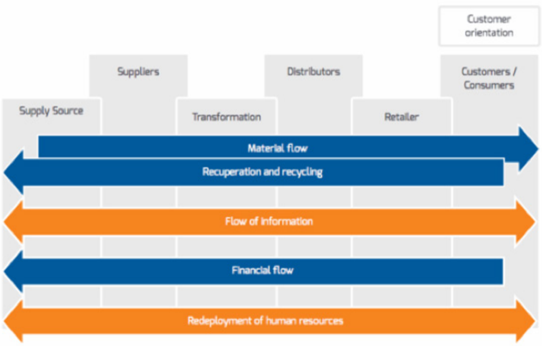
Companies that combine the «reduce, reuse, recycle» mantra with the supply chain wisdom of managing costs and stamping out inefficiencies are developing reverse supply chains that help the Earth, the customer, and the bottom line. Reverse logistics is inherently green.

Transportation is another major aspect of reverse logistics ripe for a green makeover. As with forward logistics, the execution of reverse logistics inherently requires large transportation volumes, which carry all the environmental risks of pollution, emissions, and increased carbon footprint. How then to transport returns effectively while still striving for sustainability?

UPS Supply Chain Solutions program implemented a potential solution with UPS Returns Flexible Access, which allows customers to tender return packages at any UPS or U.S. Postal Service (USPS) location, including their own mailboxes. For Buy Seasons, an online retailer of costumes and party supplies, the Flexible Access program proved to be an environmentally friendly and cost-effective way to manage returns.[19]

Reverse logistics also has an environmental advantage. Indeed, reverse logistics can be defined as a set of practices and processes designed to manage the return of products from the point of sale to the manufacturer for repair, recycling, or disposal at the lowest possible cost.

Therefore, one of the objectives of reverse logistics is to minimize the environmental impact of the companies' activities. In this sense, companies develop products and processes that are less harmful to the environment from the start.



[18] *4 tips for efficient reverse logitics in e-commerce*
[19] inboundlogistics.com

Return is a discipline that serves to optimize the flow of exchanges between the consumer and the manufacturer or distributor. We know this discipline more particularly in the implementation of after-sales services. Today, the implementation of other means of management is underway, such as the management of private and electronic bellies. The topics of product returns, recycling of returned and unused products, and end of life of products are also part of this discipline.

[20]As for as, this logistics dilemma, the main objectives here are to minimize the total cost by determining the optimal location and collection period of holding time of (ICPs); determining the optimal location of a centralized return centre; transforming the nonlinear objective function of the proposed model formulation by Min et al. The objectives of this research are to find out how firms will be able to minimize the total cost of returns by determining the optimal location and collection period of the waiting time.

Below, this table show us the percent of product returned, of the revenue spent on reverse logistics costs and the value recaptured from returned products depending on different sector of activity.

Industry sector	% of products returned within first warranty period	% of revenue spent on reverse logistics costs	% of initial value recaptured from returned products
Best-in-Class	**5.7%**	**9%**	**64%**
Consumer Goods	11%	10%	31%
High-Tech.	6%	8%	28%
Telecom/Utilities	8%	8%	28%
Aerospace & Defence	5%	11%	10%
Medical Device Manufacturing	11%	15%	22%
Industrial Manufacturing	12%	13%	22%

Source: Gecker, R. (2007). Industry best practices in reverse logistics. Unpublished White Paper, *Aberdeen Group*.
Table 1. The Impact of Product Returns on Industry-Wide Revenue

In addition, the demand for returns spurred by the COVID-19 pandemic drove a 45% growth in e-commerce in the second quarter of 2020, accounting for over 16% of total retail sales.

The increase in sales is a boon for retailers, but many were not prepared for the massive demand for outbound and reverse logistics. For retailers, there are a few tips to improve the speed and efficiency of your returns process:

- Prepare for returns before they happen
- Make sure your system is designed to receive returns in batches, separate from other inbound shipments.
- Develop a dedicated receiving process for returns: Implement a process for handling incoming packages and train staff on how to properly handle returns, evaluate items, repackage and refurbish them.

Today, reverse logistics has become the focus of the supply chain with all product return activities.[21]
This is an example, as a result of the high medical demand due to the pandemic, medical waste returns and the need for reverse logistics is increasing. And this will continue with the ongoing vaccinations. To optimize the management of reverse logistics, business models need to be designed.[22]

Covid-19 has produced a paradigm shift from in-store purchasing to online ordering delivery. A survey[23] by marketing services company Selligent, realized during the COVID-19 pandemic (In North America and Europe) shows that more and more consumers buy online and also, they buy more online than in-store. Due to this increase retailers and suppliers have to adapt their logistics. Cerasis, a global transportation company says that while conventional logistics optimizes the flow of goods from producer to consumer, reverse logistics manage that flow to deal with returned parts, materials, and products from the consumer back to the producer. There are all steps involved in processing returns. It's important to understand them and measure them. There are

[20] https://journals.sagepub.com/doi/pdf/10.5772/58827
[21] *Nizar Zaarour , Emanuel Melachrinoudis , Marius Solomon and Hokey Min "A Reverse Logistics Network" (28 Jun 2014)*
[22] https://medium.com/@AmericanPublicU/how-covid-19-is-affecting-reverse-logistics-processes-e9a052a9d4a6
[23] https://www.digitalcommerce360.com/article/coronavirus-impact-online-retail/

seven steps which are: performance to objectives, coordination and communication effectiveness, Data accuracy of inventory records, quality control and damaged and missing items, effective procedures for handling the returned product and procedure compliance."[24] Each of those steps should be reviewed and adjusted to accommodate the environment resulting of Covid-19.

[25]Today's supply chain is built on applied data and strategic measurements (thought reverse logistics KPIs). Indeed, those KPI can derive more value from returns management. In fact, Covid- 19 presents new challenges to reverse logistics managers and managers need to overhaul existing procedures and for this, appropriate resources must be allocated to achieve the expected performance.

The number of returns from e-commerce purchases is three times higher than that of physical store purchases, which makes the management of reverse logistics costly. Therefore, it is necessary to reorganize the management and find strategies to reduce the number of returns. Some have implemented online devices or refund strategies. A shipping system with multiple carriers and the use of business intelligence and data analysis can help manage returns and reduce the cost. The pandemic exacerbates reverse logistics challenges. In addition to managing an increased volume of items returned during the pandemic, companies also face the potential health risks associated with these items. SRS Media analysts explain: «A major concern right now is how to manage assets safely for COVID-19. As for the moment, the virus is supposed to live on surfaces for hours to days. Researchers found that coronavirus can live on cardboard for 24 hours and up to 2-3 days on plastic and stainless steel. When you receive equipment, disinfecting surfaces and letting new packaging rest for 24 hours could be effective. In addition to cleaning up returned products, employees must be protected at every stage of the return process. Among other things, employees should have access to a generous supply of disposable masks, gloves, and hand sanitizer.

Consumers are expected to continue to purchase more products online even after the end of the pandemic. Therefore, retailers and manufacturers should prioritize reverse logistics to optimize the process.

F. DISTRIBUTION

Distribution is a set of activities that take place from the moment the product, in its form of distribution, enters the producer's commercial store.

Distribution includes all activities related to the delivery of the product to the final shredder. Its aim is to make the product accessible and easy to buy for anyone who wants to acquire it.

A distribution channel is a mode of organization that enables activities to be carried out, all of which aim to bring the appropriate products to the right place, at the right time, and in adequate quantities.

Companies nowadays need to adapt their traditional distribution strategies.

The distribution strategy is the strategy that allows the company to sell its products and services to consumers. Distribution has a significant impact on the ecological footprint of a product or service. Optimizing delivery systems and reusable packaging infrastructure and reducing packaging waste make a big difference. Towards an iterative supply chain. Improved logistical transportation, hauling of goods between vendor and purchaser with the lowest possible impact on the ecological and social environment. This includes the whole distribution process from storage, order processing and picking, packaging, improved vehicle loadings to delivery to the customer or purchaser and taking back packaging.

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[24] https://medium.com/@AmericanPublicU/how-covid-19-is-affecting-reverse-logistics-processes-e9a052a9d4a6

[52] https://www.mytotalretail.com/article/4-tips-for-efficient-reverse-logistics-in-e-commerce/

Covid-19 crisis had a huge impact on traditional distribution and now actors are expected to optimize their methods and adapt to nowadays models from physical to digital. It covers six perspectives, namely adaptation, digitization, preparation, restoration, ripple effects and sustainability. They combine resilience, adaptability and sustainability, which are very important in the analysis of Supply Chain in a pandemic situation. Short-term priorities may be "transport and production" and "worker mobility", while long-term capabilities and strategies related to "digital readiness and data sharing" will be developed and implemented.[26]

In fact , the current Covid-19 pandemic acts as a powerful indicator of the transformations to be made in the Distribution sector. It will be a question of reviewing and diversifying sources and supply circuits in order to be able to adapt resources more quickly and with more flexibility to needs and sales potential. During the pandemic, distributors have also experienced all the interest of omnichannel to serve their customers as well as possible in all circumstances. This period has also highlighted the strong expectations of consumers in terms of health and safety, accelerating the emergence of "safe-retail". Reassuring consumers has become vital. Finally, new working methods will have emerged, integrating versatility, short decision-making circuits and collaborative tools.

When the Covid-19 crisis is over, no customer will consume or buy as before, and distributors will have to focus on at least three areas of reflection, the 3Ps:

- **Personalization**: the consumer will expect an offer and a "product / store / payment" experience directly linked to their preferences, schedule, motivations and portfolio.
- **Proximity**: consumers will travel less and less to shop; distributors will have to favor and invent new home-based and more local sales outlets and rethink the remote shopping center model by integrating a "non-shopping" experience of the cultural, educational, sports, recreational, etc. type.
- **Planet**: the Covid-19 crisis is already giving rise to in-depth consumer reflections on health and social responsibility; more responsible consumption with regard to the planet will require distributors to make a profound change of model.

Value creation on the customer level can take place at all stages of the consumer decision process.

The digital transformation facilitates and enables new ways of value creation because it allows for the fulfilment of long- standing consumer needs in unprecedented ways. As sources of value creation, automation, individualization, ambient embeddedness, interaction, and transparency and control combine a plethora of activities and processes.

This digital era allows many things in order to have an accurate segmentation and personalization of services, digital technologies can be used to enrich traditional interactions or to enable new ones along the entire consumer decision and use process.

For example, Ikea, the Swedish brand has released an augmented reality app ("Place") that allows customers to see how specific furniture would look in their homes, thus providing experiential value and improving the buying experience.

This digitalization has also been seen and developed through social media platform and online media platform. Everyone knows that since the Covid-19 the online media platforms (Netflix, Amazon Prime, Disney, Hulu) have known an incredible success, movies which were used to be broadcasted in cinema theatres are now directly online. Furthermore, of knowing just a huge success, most of these platforms really increased and developed their offer following the Covid-19 spreading.

[26] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7298926/

Around the world, users of online streaming platforms like Netflix, Hulu, Amazon Video, or Disney+ show heightened levels of concern about the negative impacts of the coronavirus.[27]

The distribution circuits had to be lengthened to get closer to the customer as far as possible, to go to his home since he was not allowed to travel. Being confined also increased household energy consumption.
Streamers also seem to escape this continued anxiety around the outbreak by spending far longer on online media and increasing the time they spend on nearly every device.

It is not only about getting more customers, but also reported that even people who were customers before the pandemic spend now much more time in front of these programs than before the pandemic.

Obviously, the pandemic has in some cases changed the distribution methods of companies.

After analysing his customers and product characteristics, the producer will choose to take a short circuit or a long circuit. A long distribution channel goes through several distributors or wholesalers before reaching the retailer and then the end customer. A classic distribution channel goes through a single wholesaler before reaching the retailer and then the end customer. A short distribution channel does not include any intermediary between the producer and the retailer who will sell to the end consumer. This type of short distribution can be impacted by covid crisis because without intermediary it is hard to send the product at the client location.

He will then decide on his strategy, a push or attraction strategy.

[27] https://blog.gwi.com/trends/streaming-habits-coronavirus/

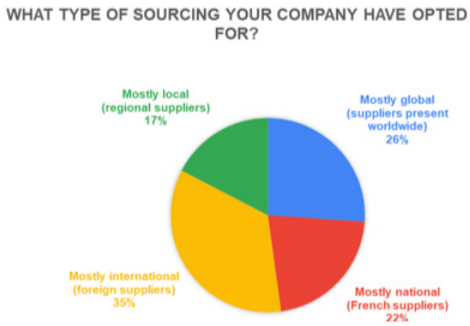
Partie 2

FIRM VISION

A. SOURCING

The first question we asked about the sourcing topic to our interlocutors was what type of sourcing the company has put in place.

According to the graph, we can notice that **35%** (which represents more than a quarter) of the companies interviewed have an international sourcing which means that there is a tendency to source internationally. In fact, today companies are open to work with different nations.



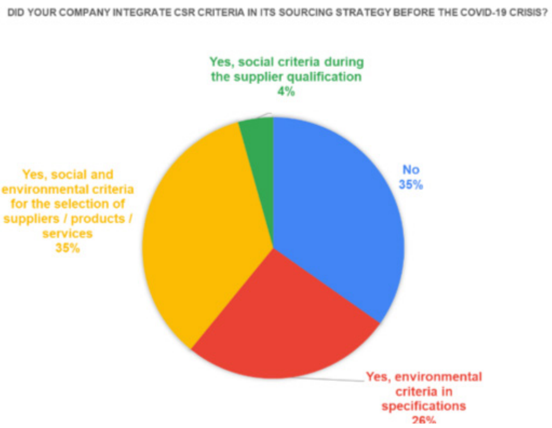
Usually, the main motives for companies to adopt an international sourcing are that the goods or raw materials are not available in their own country or because it is cheaper abroad (mainly for cheaper labor work) or that the country does not have the skills to develop the product.

Concerning the global sourcing, it represents only **26%**. We can understand that the globalization is less widespread, and the Covid-19 may have impacted this type of sourcing.

However, we can also observe that **22%** of the companies have opted for national procurement. The reasons for them to choose this type of sourcing could be various: lower logistic costs, less delivery times, simplifying their supply chain...

Regarding the local sourcing, only **17%** of the companies have selected this sourcing. It can be difficult for companies to source local and find their suppliers in the same region as they are located.

Before the Covid-19, most of the companies interviewed had already taken measures concerning their sourcing strategy.



In fact, **35%** of interviewed companies had taken social and environmental measures in their sourcing strategy before the Covid-19.

26% of the companies were already considering only environmental measures in the choice of their suppliers.

35% of the companies questioned ensured that there were no CSR criteria during the qualification of their suppliers

Finally, only **4%** of the companies did take into account only the social criteria for the qualification of their suppliers.

Therefore, we understand that before the Covid-19 crisis most companies were aware of these aspects. We can say that there was already an awareness, and that the crisis of the Covid-19 has only accentuated it.

In this question, we have asked the companies if the covid-19 has impacted their sourcing strategy and why.

Companies interviewed on our survey expressed having been impacted by Covid-19 for 52% of them. This impact has been most of the time on the lead time in term of deliveries. Deliveries have been such an issue for them because they suppliers are located all around the world such as Europe, America, and China. Some of the companies that responded to our survey which have their main supplier in China, were greatly impacted on their activity because they were not able to deliver their customers on time and they have been forced to cancel many orders to their supplier because in China, everything was closed during the first lockdown.

Thanks to this survey, what we understand is that the choice of sourcing is directly linked to the transport industry or that the delivery process has been the most impacted by this pandemic in March 2020. In fact, due to the pandemic and the lockdown in March 2020 the choice of supplier is influenced by the cost of transport. One of the companies tell us that the cost of delivery has been increased during this period and it was hard to follow for them.

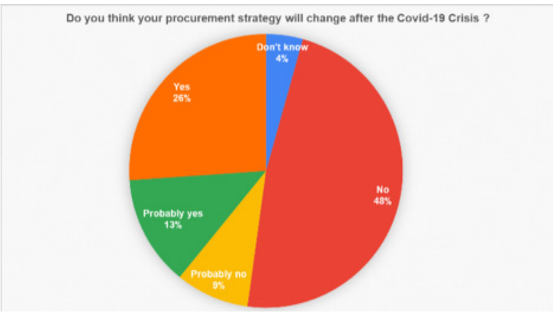
For about 48% of the companies interviewed, the Covid crisis did not impact their business. We understand thanks to the answers that it is because most of them have their business online and because they sell services and not manufactured goods. For example, the second-hand clothes industry has not been impacted because the sorting centers were still working. Other example, a company specializing in installation of fire safety has not been impacted.

On the other side, the Covid-19 crisis has also led to some of our participants to adapt more quickly and anticipate more. For example, one of our participants explained us that they have adapted their digital services to the different typologies of B2B clients - such as hotels or CSEs - by adding new functionalities required by the sanitary protocol (e.g., digitized documentation, Covid-19 information etc.).

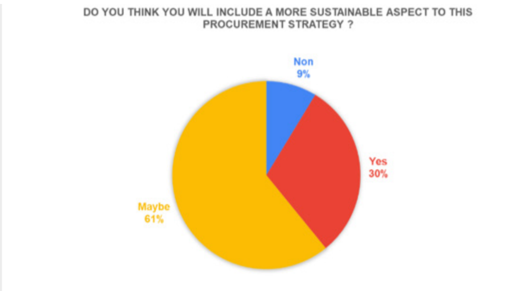
Moreover, in few cases, the appropriate strategy to deal with the Covid-19 crisis was to rely on regional suppliers.

We asked our participants about the measures they have had to put in place to face the crisis. The outcome was as expected. Most companies opted for their staff to work from home, develop and/or accelerate the digitalization of all the processes and all the paperwork to completely work without all physical interaction. 4 respondents told us that they chose closer, more reliable furnishers and change their means of transportation such as naval and aerial companies to reduce their cost and maximize fast and qualitative communication. Only one of them expected to rely on Macron government's help to face drastic treasury reduction, perhaps a sign that companies used this time to really change their ways rather than adopting the status quo and rely on subventions.

We may interpret these results as a proof that Covid hasn't impacted all the sectors the same way and that some of them, that already had reliable, national, and international suppliers were better prepared to face the pandemic which has only had a relative impact on their supply chain.



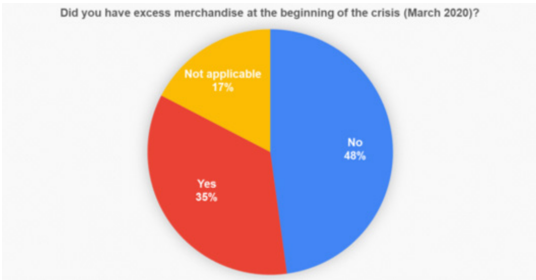
According to the interviewed companies, the procurement strategy is mostly going to change after the Covid-19 crisis. In fact, 39% of them have a positive opinion and affirm that the sanitary crisis will have an impact on their current way of procurement. Some of them are currently adapting to be able to pursue their activities during the pandemic and will keep this change for the future. This pandemic has given companies the opportunity highlights some weak points which are going to be subject of adjustments in their strategy. Others are going to change it but only in some aspects. For examples, the actual strategy will remain the same with their current procurement, but it will be slightly different for new ones. Over all 40% of our respondents say that Covid-19 will make them change their procurement strategy after the crisis is over (has are not 100% sure but according to 5 companies, there will probably be some changes in their current procurement strategy.) It is not the case for everyone, given that 48% of companies have responded in a negative way, which means that the Covid-19 crisis will not be a factor of changes in their procurement strategy.



Among companies responding to the survey, 30% aspire to include a more sustainable aspect to their procurement strategy. 61 % are thinking about it but are not sure. And finally, 9% claim not to have plans to include more sustainable aspects.

B. Storage

We can see trough out the survey analysis that, interviewed companies were not heavily impacted by the beginning of the unexpected event of Covid. Because of the unexperienced situation amongst governments and companies, they were no rules designed for this type of situation which led to a delay in affecting the supply chain of companies.

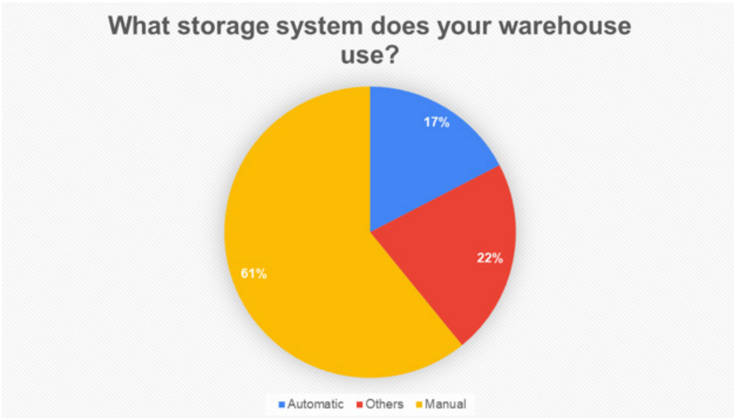


Surprisingly, many companies did not have to rethink their organization of their storage in order to respect social distances. Indeed, 48% of companies did not experience a over-stock of merchandise at the beginning of the pandemic. However, 35% of companies did experience a surplus. The majority of these companies are in the Trade, Distribution, Transport & Pharmaceutical Industry sectors. Indeed, we can state that these companies have materials to stock. Without inventory, their business cannot function, and this explains why they had to face this excess.

We can see here that there is not a huge difference between the data of companies who had a supply chain disruption. This highlights that most companies were not greatly impacted by the beginning of the event of Covid. This confirms that at the beginning of the pandemic, they we're still a fluidity.

There is a mix of answers, where companies used different strategies. Some companies were not affected because of their business model (e.g. selling online) and so they were able to carry on with their activity. Some others were also able to carry on their activities because they were seen as 'essential'. Furthermore, some companies already had a stockage facility and therefore, did not suffer from the surplus. On the other hand, a few companies had to either throw away stocks, give it to charity or simply return it to sender where possible. And naturally some companies just stopped ordering from their suppliers. This illustrates that every company took different strategies according to their business model and constraints .

This event did cause many disruptions in the storage of goods, and so an importance has been put towards automatization of these space. From the responses that we obtained; we can see that almost 61% of companies use a manual storage system while only 17% of companies use an automatic system and the remaining doesn't have a system of storage.

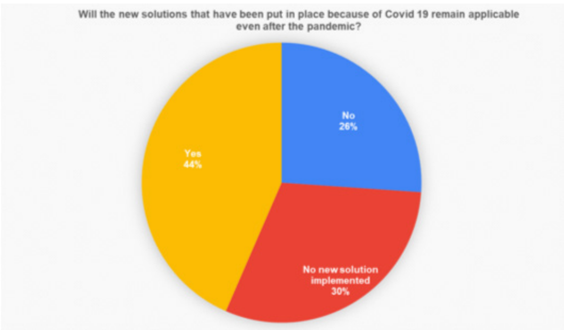


It can be seen that even today, while there is a strong increase in the field of e-commerce, the majority of warehouses remain manual. This may change in the coming years, but it will require a reorganization of the work of the staff. We can see that the remaining 22% of companies say that they use another means of storage, perhaps they are companies that do not sell products but rather services, so they do not need a storage system. Due to this dramatic turn of event, it was important for companies to adapt their storage organization in order to respect new social distancing rules.

We can observe that 70% of the companies had to adapt their storage organization compared to COVID-19 while 30% remained the same.
We can therefore see that it must have taken a lot of work for these companies to rethink their strategies and operations. It must also have generated an additional cost for these companies, for example by providing staff with gel throughout the warehouse and enforcing social distances. We can also imagine that for companies with small warehouses this must have been particularly difficult as they may have had to reduce staff numbers due to lack of space in the warehouse.

Some companies had to discard or destroy their goods to clear some space in their warehouse and also because the products could no longer be used. It is important to know that whatever the decision, the companies had to pay a cost for this as well and it is not only a cost for the loss of goods but also a disposal cost.

Some companies tried to minimize the damage by finding more cost-effective solutions.They checked with other entities in their companies to see if they needed the goods. They even contacted their suppliers to find a way to manage and redeem what they needed for other customers. While other companies opted for the solution of making donations to associations for redistribution to those in need. The lucky ones had an extra warehouse not far from them, so they were able to store the goods there. Many even managed to empty their stock in time by selling what they had because their factories were themselves closed, they did not receive any extra goods from them, so their customers had no choice but to buy what was in stock from them.



Nevertheless, companies have had to adapt to new solutions to keep businesses running, however, will companies maintain these changes? Undoubtedly, some companies have adapted new solutions because of the Covid19, and what is good is that those solutions are still in process. But we can also see that 30% didn't change their way of storage during the global pandemic.

Due to the reorganization of companies, we felt that it was important to find out if companies did in fact maintain their priorities of CSR despite of the unforeseen situation.

This will depend entirely on the company in question. Some companies will impact the environment more than others. If a company is receiving their merchandise exclusively from an international supplier, then yes, the covid has greatly decreased their environmental impact. The carbon aspect by necessity is therefore impacted and has gone down in these kinds of cases. Companies are mainly sourcing paper and cardboard, if orders are reduced and with new type of materials that are more sustainable, it impacts positively the environment. This means that less waste is produced.

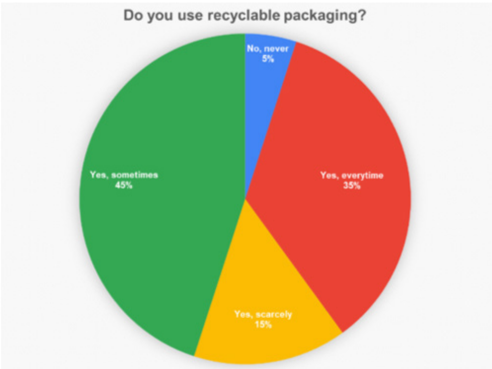
Other companies have not noticed any improvement regarding the new environmental measures, or they have just not yet estimated the new impacts.

On the other hand, a huge number of masks and hydro gel will need to be ordered and produced which in turn will have an impact on the environment. The negative impact on the environment has also been noticed naturally in some companies. For example, some warehouses have had to review their packaging systems due to shortages of certain materials and the slowing down of the supply chain. For example, some companies have reintroduced plastic packaging in order to continue their business.

C. Packaging

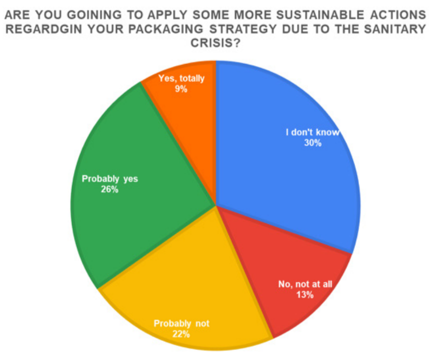
The 3 most represented fields are the following: transports & logistics (22%), commerce, trading and distribution (18%) and Space &Defense and Pharma (9% each). From global companies to small one, they all accepted to provide us the strategy and the future they gave to the packaging importance within the company.

Almost all companies require packaging for their activities. For our sample, two third of the surveyed companies are using packaging that are manufactured in Europe. The others are fulfilling their needs of packaging in Asia, where for information the delivery time is longer and where humans are manufacturing packaging, not machines like in Europe. The place where you buy packaging on Earth imply a desire of CSR involvement and besides more expensive cost if you choose to produce in Europe to respect human right or maybe to subscribe a greener behavior by using recyclable materials for your packaging, which will increase your cost. Therefore, we have been questioning our sample on their initiative in recycling. On one hand, we asked them if they were engaged in the use of recyclable packaging.



We can see on the following graphic, that more than the half are putting as a priority the use of recyclable packaging, 35% are using it every time and 45% from time to time. Only 5% of companies are not involved and never use some recyclable material for their packaging. We can note that the green development and engagement of companies are really rooted in the business orientation nowadays. Even if we do not reach 100% of recyclability, some actions and decisions are being taken to increase that percentage. On the other hand, we asked those companies if they were internally recycling packaging, and the answer are quite different. The majority recycle : 26% do recycle often and 26% do it every time. But 35% do not or seldomly recycle.

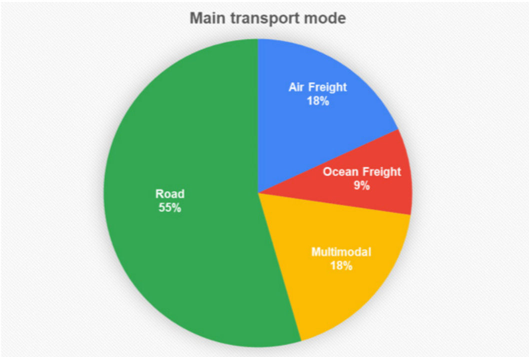
To link our survey to our issue, we questioned the sample about the impact of the sanitary crisis that last since 2019. Around 86% of the companies that are using packaging didn't notice a modification on their activities and strategy regarding packaging while 14% did. The noted changes were found in the volumes that they order. This volume often decrease as the sales were slowing down due to the shops' closure. Besides, some companies met a shortage of raw materials that led to a slowdown in production and transportation. One more example is a company that have changed its strategy by implementing individual packaging to the business. As a conclusion, what we noted the most frequently is that the Covid-19 crisis impacted the packaging demand by the increasing difficulties of procurement in terms of raw materials, the demand changed, and the suppliers had to adapt. We also ask the companies if they were thinking of implementing new strategies to their current actions, always regarding packaging use.



9% of the companies are sure to act different and 26% are thinking about it. 35% do not think about changing their behaviors and habits, and 30% have no idea yet if covid-19 will create an opportunity to modify their strategies of packaging. For the companies that responded positively to the fact of changing their packaging practices, some of them provided explanations such as:

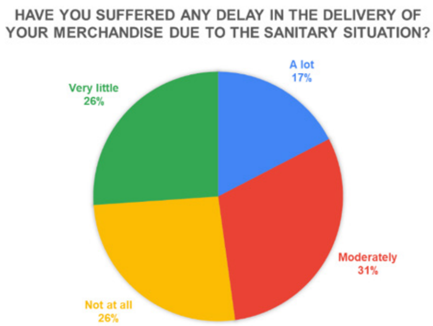
- The selection of raw materials and suppliers with which the company works closely,
- The lack of perspective
- The Packaging optimization is more related to a specific program for carbon footprint reduction than to the health crisis,

D.Transport



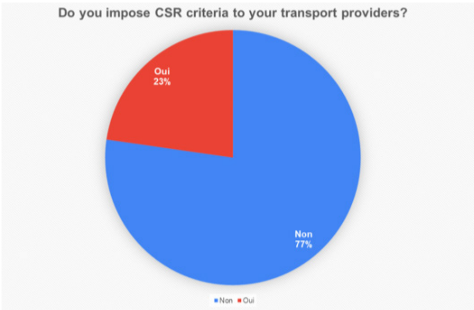
To the question «What was your main mode of transportation before the health crisis?» 55% answered by road, 18% by air, 18% by multi-mode and 9% by sea, so we can see that most of them use the road method. This result shows that most of the participants confirm that they use road and air transport, which are the most carbon-emitting and therefore the most polluting modes of transport.

In the question, «Have you suffered any delay in the delivery of your merchandise due to the sanitary situation?» we could see only 17% people were really affected, so we can say that more than the three quarter of the participating companies have not been affected in their deliveries because of the sanitary crisis, this is because the deliveries of merchandise have not been really affected. Among the 17% severely impacted, it to note that 75% are Transport/logistics companies. It shows the role of logistic/provider in the crisis management and the strong reduction of crisis impact on the customers.



In terms of transport strategy change due to the covid crisis, none of the companies surveyed had made any major changes to their transport, strategy and only a quarter had made partial changes. This low level of adaptation came as a surprise. It is therefore necessary to ask whether those companies that did not change their strategy were not simply unable to do so, since it is possible that, since transport was at a standstill during the COVID crisis, many actors simply did not have the technical possibility of adapting to the new situation. To put it another way, when everything is paralysed, there is not always any other solution than to wait for the return to normal. One explanation could be that most of the companies interviewed use road transportation which is the most agile and flexible and available during the crisis did not had much impact on a local level.

The environmental aspect is becoming a factor of choice in the transport strategy. Actually, 46% take the environmental aspect as a factor for their transport choice against 54% who don't. This will be further reinforced by the following question.



Here we can see that three quarters of the companies do not include their CSR requirement in the selection of their transport providers. However, an effective and sincere CSR charter must include a section on transport (when it is the main source of pollution). It can be assumed that a large proportion of the companies represented in red above do not have real CSR criteria.

As we could see from the survey results, many companies in all sectors of the economy were affected through their means of transport, many things have changed and will continue to change the way we do things for a long time to come. This new reality to which we have had to adapt in a compulsory and rapid manner, has led us to change the way we did things, and Freight Transport in all sectors has played a key role in this new reality.

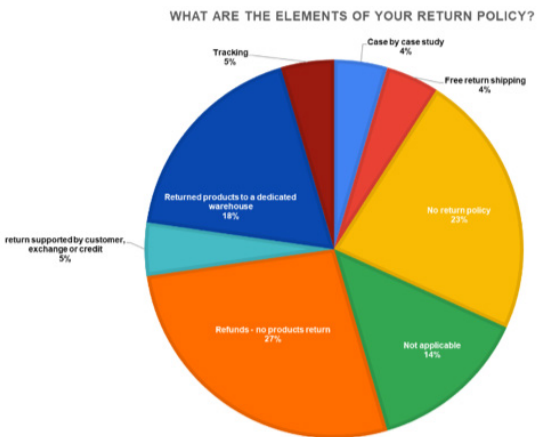
With the first warnings of the arrival of the pandemic, the transport of goods had to face the fear of shortages, we saw supermarkets, shops and warehouses out of stock, putting to the test local supply chains that often work on a very tight just in time basis.

With restrictions and decreases in both freight and passenger transport, global traffic decreased and the lockdown of people, transport companies had to adapt quickly to meet the new needs of a homebound society with the need to buy more than just basic necessities.

In conclusion, the global freight transport landscape is changing as the global health crisis unfolds, and the important thing is to be able to analyse and prepare ourselves on the basis of the experience we have learned in order to strengthen the logistics chain and secure supply.

E.Reverse logistics

The reasons for these returns are multiple: damaged item, wrong size received, the product does not meet the expectations of the buyer. And in all these cases, the dissatisfied customer legitimately hopes for an exchange or a refund. Therefore, it is important to have a clear return policy that benefits everyone and a good system for managing returns and exchanges. As a result, we decided to ask various questions about the return policy of different companies.



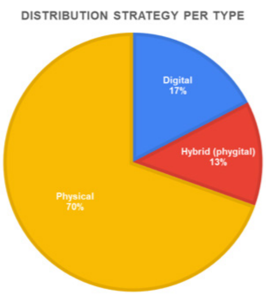
23 % of companies do not have a product return policy. For 14%, it is not applicable. This result is probably linked to the sector of activity. For example, the banking sector, the tourism sector, defense and aeronautic sector, but also the building construction sector don't have a reverse logistic in place. The companies in these sectors do not need a return policy because it is not appropriate for their business.

58% of the companies have set elements of return policy. If we exclude de non applicable conditions, the rate is 73%. But, if managed effectively, returns operations can enhance customer loyalty, strengthen brand identify and increase profitability for the company. In addition, we analysed wither this present to companies surveyed. It also allows companies to get back waste they can turn into raw materials and new resources.

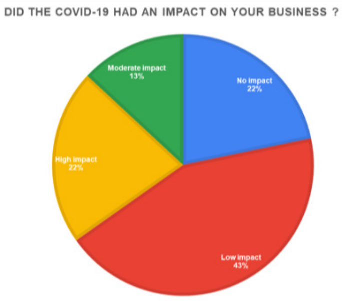
Two companies (second-hand furniture and telecommunication) answered that they use reverse logistics for the return.

The telecommunication company that responded positively use reverse logistics by recovering products and reintegrating them into the production chain or removing them from it. When there is an error on an order, they will recover the material and if there is no possibility of reintroducing it into the distribution chain, then it is sent for recycling. They have a product tracking system with serial numbers. If the products have a serial number after recovery, they are put back into the distribution chain, into inventory for future orders.
Regarding of the health crisis, some retailers said that dealing with returns has a negative impact on the day-to-day running of their business. Online retailers offer free returns but offset the cost of this by charging for delivery with occasional increase of the price of products to cover the cost of returns. For large companies in the telecom business, there was a lot of product loss. Like other companies, the management of returns was very complicated, because of the increase in delivery times, some addresses were wrong and there was no one to receive the deliveries.
As a result, companies had to adapt to the situation and set up a much more suitable follow-up to limit the number of returns and losses.

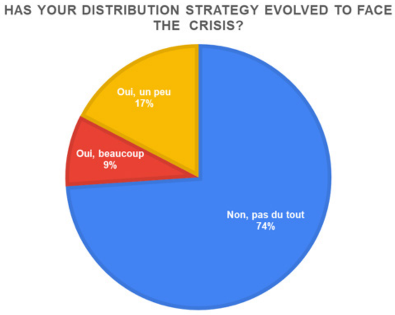
F. DISTRIBUTION



It seems that regarding distribution strategy, most companies included in our survey use physical distribution with a short intermediary, while digital distribution follows with direct circuit. Hybrid distribution is still less used than other strategies such as long circuits. We can conclude that companies prefer using physical strategy instead of digital in order to minimise costs and environment impacts . They also stay in a classical model with physical distribution.



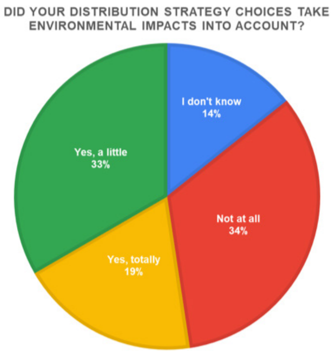
The Covid-19 did not impact companies distribution : 65% of the companies surveyed believe that the covid-19 crisis had no impact or a very low impact on their distribution. This mean that the crisis did not affect their activities and more particularly their distribution channels. Transport companies have been impacted in their day-to-day supplier activities.



As we can see on the picture above, only 25% of companies surveyed had to adapt their distribution strategy due to the sanitary crisis, it is less than expected, and only 9% had to do major changes in their distribution strategy, even though this is less than expected it matches with previous graphic where we can see that sanitary crisis had major/medium impact for 35% of the surveyed companies.

The surveyed company which didn't operated any changes didn't felt that it was necessary and making changes would not bring enough benefits.

Most of the strategies have not changed, for the one that is, they tried to save on supplies or transport agreements for example. They also reduced the number of sites to be delivered and centralized.



Environmental impact are important for less than one in five companies, which is fully committed to its distribution strategy. A third of the companies take into account the environmental side but in a minimal way.
Unfortunately, 34% companies do not take the environmental impact into account. That is logical since 65% of the companies surveyed didn't notice an impact of the crisis on their distribution.

Partie 3
PROSPECTIVES

A. SOURCING

Thanks to our survey and extensive (scientific and professional) literature review, we have found that companies which are manufacturing products have been more impacted by covid-19 than others. As a result, companies have had to adapt and find solutions after the pandemic stops and activity resumes completely.

Some companies will go back to their first sourcing because they still want to buy cheaper in order to increase margins. During Covid they adapted their strategy but just for the time of the pandemic and wait for the end of Covid-19 to go back to their previous ways.

Some companies will still use their previous sourcing strategy because they have already stricken deals with them and ensured the best prices for their business, but the Covid 19 has underlined many loopholes that they will correct especially when it comes to special clauses in their contracts. These special clauses will become permanent to prevent any issue whilst dealing with any kind of crisis in the future.

However, many companies have had to change their strategy completely during Covid 19 and these changes have become their new sourcing strategy for the post Covid era. In order to avoid any delay or order cancelation, some companies have had to select suppliers close to their customers or factories. These companies are the ones who most suffered during the pandemic and have lost a huge part of their turnover, they have learnt the lessons and cannot afford to make the same mistake twice in the future. The market has evolved and adapted to Covid, and so have they, to survive and thrive in their market.

Finally, the Covid-19 pandemic has allowed companies to start their digitalization process or develop it faster that they had already planned when their companies physically closed down at the beginning of the pandemic. They have completely refunded their business model and bureaucratic processes to integrate digital tools in communication (websites, click and collet, online shopping), marketing process (CRM).

To conclude, companies and sectors have been impacted unequally in their sourcing strategy during Covid. Therefore, it is almost certain that the sourcing department have profoundly change during Covid and will certainly have to adapt again after Covid to achieve a relative common model. Digitalization was key to perform in times of pandemic and companies have done just that. One might ask if it will at all impact the quality of sourcing if too many processes are digitalized. The main goal for companies is to secure and protect their procurement strategy in the future so that they would not be impacted by another worldwide crisis the same way they have been during Covid.

B. Storage

According to our analysis, we have come to conclude that the management of the storage of companies will be re-evaluated due to the unexpected event of Covid19. Companies have noticed that geographically, suppliers must be near in case of unexpected events. Environmentally, this means a reduction in CO_2 emissions and therefore, Covid has indeed allowed to think of new solutions which are equally beneficial to the environmental impact. Companies will also reduce the large stock of goods, as many struggled to sell out their stocks during the pandemic. Reducing stocks will also mean a reduction of an energy strain in terms of the use of electricity, use of machineries and reduction of space used. Having a closer supply chain will reduce disruption and allow companies to order only when needed. it will help overcome a waste of products or an overstock that will benefit customer with shorter delivery time . Even though this may lead to cost increase, it is an aspect of an environmentally friendly solution and hence one of the only perceivable solution. Therefore, are customers ready to pay extra for a reliable supply and an environmentally friendly solution?

Companies selling non-perishable products can indeed overstock in order to keep their current overseas suppliers. This will allow companies to stay productive and plan when there are signs of unexpected events and maintain their current prices. However, this has an environmental impact as overstocking means more energy consumption. Therefore, we must wonder if environmental improvement will remain a priority or will financial gain be a priority for companies ?

Green logistics may be implemented in distribution centres if waste is managed according to environmental considerations. To do so, it is necessary to

- Create a system for categorizing your waste according to the materials subject to recycling.
- Install cutting-edge IT solutions, such as warehouse management software
- Control how your waste is recycled so that the proper processes are followed.

Inventory management and reverse logistics must be changed. The concepts of green and sustainable logistics include having an efficient storage facility. Indeed, a general improvement in the flows will contribute to waste reduction. Consider the following scenario:

- Improve the addressing of the items and arrange all of picking jobs properly to reduce travel inside the warehouse.
- Using robots and automated systems, to avoid stock damage caused by manual handling.
- If working with shelf-stable products, FIFO stock management is critical for keeping track of expiration dates and preventing spoiling.
- To make the most of reverse logistics management, develop quality control criteria for your client returns.

C. Packaging

The Covid crisis has had a major impact on the packaging sector. To cope with this health crisis, companies have had to lower their CSR objectives for packaging.
The drop in consumer purchasing power due to the economic impact of the virus and the change in consumer habits towards larger packaging for more protection and towards e-commerce, which is increasingly consuming packaging, have forced companies to review the quantities and materials used for their product packaging.

As a result, we can see two major scenarios taking shape:

In the first case, the global economic situation risks imposing more laxity on institutions in terms of legislation on the ecological and social impact of packaging. To promote growth, and encourage consumption, companies will have the opportunity to limit their margin loss by using less expensive and more robust but seriously polluting and non-recyclable materials. This delay in the packaging sector will be beneficial in the long term, as the growth of companies in the sector will allow for more investment in the research and development of new materials and eco-responsible technologies, and thus accompany the ecological transition with greater confidence in the packaging sector. This scenario may prove to be a great risk to the environment. We are at a crucial stage where ecological transition is no longer a possibility but a necessity, the impact of a sharp increase in the use of raw materials such as plastics, long criticized for their high pollution rate, could cause irreversible damage and destroy all the common efforts made so far to protect our environment. As our study shows, around 65% of the companies surveyed do not intend to change the way they package their products. This shows that it is up to national, regional and international institutions to force change.

In the second case, the ecological emergency takes precedence over the individual growth of companies, legislation on the ecological impact of packaging is strengthened and companies are obliged to comply with the norms and standards set by the institutions in force. Companies will then have to face a double challenge, satisfying CSR obligations, and getting as close as possible to the needs of consumers, demanding more protection at the expense of ecology. By this means, the institutions drastically reduce the ecological impact of companies at the end of the crisis, at least in the packaging sector, to the detriment of their margins. The economic recovery will be slowed down, but this benefits the development of the transition towards a greener and more ethical economy, which will once again become the main concern of the consumer when the health crisis loses its magnitude as a result of technical innovations in the health sector, such as vaccines. It is therefore a long-term vision of a common effort by all companies for a more stable and responsible economy and growth.

To conclude, we can say that COVID 19 crisis had impacted the packaging sector. Indeed, whereas the ecological impact is more and more important for companies and customers, the crisis has improved the number of packaging around products. Nevertheless, today the protection of the planet has become a real necessity and many companies want to satisfy their customer’s needs. In this sense, it could be good for governments to put in place aids to help and sensibilize companies to act in an ecofriendly way.

D. Transport

The unforeseen nature of the crisis and its magnitude have forced the various actors to adapt without delay, with emergency solutions that are unsustainable in the long term. For example, some companies no longer had access to certain raw materials from the other side of the world and had to source them from France or at least from closer countries (Europe). However, those backup solutions have a very different cost and are therefore very difficult to maintain when the usual suppliers can deliver again.

Also, we are currently experiencing a counter-crisis since the recovery of the global economy. Almost all markets were at a standstill for several weeks or months. When activity picked up, raw material suppliers could not support the explosion in demand and needed time to re-supply (especially in the food industry where it takes time to grow plants). This strong demand for raw materials is mainly driven by Chinese industries. The latter has important financial means and can afford to pay more than its competitors. This obviously inflates the prices and the other companies have a lot of trouble to supply themselves. This creates a new crisis of raw materials and the actors are always in crisis management. In this context, it is not possible to focus on CSR.

We have seen different consumer expectations than before the crisis, especially regarding the origin of raw materials. These expectations are gradually being shifted into companies' CSRs, but it takes time. Indeed, it is very simple to modify a CSR but its implementation requires much more time. It is necessary to take the time to redo the sourcing of all the closest suppliers, which are able to provide the requested quantities and at an interesting price. The additional costs will have to be included in the future budgets and short, medium- and long-term strategies of the companies. There is therefore a risk that some companies, even if they are aware of the problems, prefer to keep their profitability rather than to gain in social quality if it is not financially profitable.

The sanitary protection measures imposed on transport and the fear of the virus seem to persist. We see that public transport is starting to fill up again but has not really returned to pre-crisis levels. Indeed, many people still flee these busy places and individual means of transport continue to grow (at least for the non-polluting ones). As consequences, the development of alternative modes is still increasing but with a strong come back of individual cars and an increasing use of motorbikes. The real impact of COVID on the urban ecological transition is unclear: what is the future of "voies COVID in Paris" for example? The increasing amount of fatal two-wheels accident is has also negative impacts on transport change. Moreover, the consumption pattern has huge impact on urban transport, in terms of good delivery. The increasing demand for home delivery negatively impacts environmental goals. There is an obvious societal dissonance: more bicycles for environmental consciousness, but more home delivery (amazon, uber eats…) from companies which sustainable companies are arguable (amazon and not potential polluting vans, Uber eats and low "wages", some even using the word modern slavery….)

TRANSPORTATION SCENARIO CHART

Two scenarios may be presented, one optimistic and one pessimistic.

Optimistic:

The companies, pushed by their own convictions and by the citizen demand, will mobilize in mass to change their brain set and especially their strategy of supply and delivery, in particular through a policy of valorisation of green means. Consumers will support these practices and promote them through their purchases, thus creating a virtuous circle. This scenario could develop in two phases: first, a kind of parallel green distribution channel (like organic is a parallel market today) that would gain more and more market share. This appearance of a second market has already begun with the appearance of short circuits. They were largely pushed during the confinement. They have the enormous advantage, for the distributor, of not (almost) worrying about the last kilometre. Then, the second stage would be a trivialization and normalization of this parallel market, which will become the new norm. We can cite in history the case of cell phones, which for a while were competing with smartphones and which today almost no longer exist. Then, perhaps in the rather distant future, polluting transport will be entirely replaced by virtuous transport.
As far as transportation is concerned, the efforts started more than 20 years ago will continue and we will see the arrival of new means of transportation and new transport organisations (sharing economy)

Pessimistic:

The wave of awareness will taper off and the comforts of "life before" will overwhelm the good resolutions made. The costs of changing transport use will be considered too high in relation to the return on investment, and companies and consumers will give up. However, it can be assumed that companies will have contingency plans in place to deal with supply and transport crises, but these will not become the norm.

E. Reverse logistic

That is why then a company sells a product, a return policy must be organized. However, companies can set up a fitting system: if you don't like the product, if the size of the garment doesn't suit you or if you simply changed your mind. The right of withdrawal will be put in place so that consumers can try on and evaluate the quality of a product purchased online as they might in a store.

When products are returned to a dedicated warehouse, we recommend recycling the products, when possible, to cover some of the loss in value. Economically, this would be an advantage for the company, and it would further accentuate its CSR dimensions, which should not be overlooked. The manufacturing company can commit itself to recover the product through its own carrier, and thus manage all the return logistics. This would be an additional management burden but on the other hand a gesture to its customer and would strengthen the trust in their commercial relationship.

Finally, we recommend setting up a system of return of products, in which the carriers would recover the nonconforming products in one trip, thanks to a good organization of the logistics. This will allow the company to recycle these products and give them a second life.

F. DISTRIBUTION

As shelter-in-place and stay-at-home orders have become much more developed, consumers and B2B buyers run online to make purchases, expecting Amazon-like experiences. Though e-commerce sales have not increased in every industry, reliance on digital buying mechanisms is here to stay.

At the height of the Coronavirus outbreak, we heard from companies who had seen an uptick in online activity even from their most technology-averse customers. Customers are growing more comfortable with digital tools and adoption of digital is on the rise and this trend will keep going.

Many B2B companies are finding out the hard way (less sales, loss of customer which cent to competition) that they are not fully equipped to serve customers in a digital-first world. And it seems that this is what they are going to work on, According to Episerver's second-annual B2B Digital Experience Report (a survey of 600 global B2B decision makers) most of companies think that investments in technologies (especially ecommerce and personalization of products/services) is going to be their main field of priorities within the next few years.[28]

Amongst this survey, it is revealed that 93% of manufacturers and 95% of distributors said they expect that approximately 20% of their revenue will be derived from the B2B ecommerce websites they own and operate by then.

It is also reported that 42% of manufacturers and 37% of distributors say personalizing the digital experience to each customer needs improvement in their organization.

We can expect to see people use more regularly the digital relationship between online stores and their point-of-sales.

Sectors like retail will know the most changes. The arrival of new technologies could completely transform the sector in the coming years.

[27] https://www.episerver.com/articles/post-covid-predictions-for-the-manufacturing-and-distribution-industries

Robotics will gain more and more place on the shelves in the long term and be a help for the workforce.

It's not about replacing cashiers but robotics on store scale is one of the next big revolutions in the industry. Robots allow productivity gains for in-store trades. "They perform tasks such as detecting shortages, managing stocks, cleaning stores. The filling of the shelves or the facing are not yet under study."

Also, new technologies will have an impact on reducing in-store stocks. Store cash flow are being optimized thanks to logistical efforts and new technologies. Cash flow requirements will be essential to ensure the sustainability of the investments that the digital and ecological transition imposes. New technologies will accompany stores in the years to come in managing their dormant stocks. As a direct gain, it is necessary to consider a reduction in logistics costs, a gain in productivity and improved cash flow.

Customization of the offer for demanding consumers.

The demands of consumers are being felt both in the shopping cart and in the number of shops. The marketing of tomorrow will lead stores to understand their customers even better. With the help of artificial intelligence will be at the service of marketing managers. It will be based on needs, aspirations, tastes and consumer trends.

The customer of tomorrow will have this sensation of an offer tailor-made for them. New technologies will take advantage of recommendations, purchases and reviews on the web, and will both retain existing customers and attract other consumers.

An acceleration of societal transformation to improve the ecological impact.

CSR is already at the heart of retailer strategies. Sustainable development, responsible consumption and the carbon footprint have become more important than ever before. The next generation will attach more value and importance to environmental issues. This will be an argument of choice in the frequentation of stores. By 2025, large retailers will establish ecological transition programs to meet the requirements set by the climate agreements and / or the European Union.[29]

[29] https://jebosseengrandedistribution.fr/2020/10/01/6-predictions-grande-distribution-du-futur/

CONCLUSION

The Covid crisis is an unexpected event, some companies have to rethink their entire supply chain network in order to fulfil their final end customer requirements. It starts with their ability and agility to find raw materials, components and services to keep on manufacturing essential products and services. For some companies it is time to focus on sourcing components for most important range of products and stop producing non- essential products.

Companies with a mature sourcing strategy and contingency plan in place are more resilient. It means that they avoid single sourcing and foster dual or multiple sourcing strategies in order to first and foremost, secure their supplies and less to reduce their purchasing costs

Buyers face a difficult challenge: securing suppliers and manage costs as prices rise due to a very high Chinese demand.

The health crisis is leading companies to consider the opportunity of back shoring strategic purchases. Local sourcing can shorten distribution channels and reduce transportation which is better for the environment.
The Covid-19 has affected all forms of passengers and freight transportation. If passenger transport dropped dramatically, the freight transport was reduced but essential services were still operating. This meant a large positive impact on CO_2 emissions.
Some companies have to adapt their transportation modes and all changes operated in transport strategy will have a long-lasting effect. If this may have a positive environmental impact, it cannot be considered as the main driver.
Returning goods that costumers don't want, recovering products, recycling material are drivers that push companies to implement reverse logistic. It is a way to use and maximise return leg, save costs and reduce greenhouse gases emissions.

Working with local or national suppliers allow to implement a Just in Time methodology. Even though local purchases may lead to a purchasing price increase, the reduction of storage cost can mitigate it. Storage requires cash and spaces.

Therefore, it is necessary to develop strong partnerships with suppliers, this can help to face lack and now scarcity of raw material. Warehouses and distribution centres have to cope with labour scarcity and social distancing which lead to much more digitalisation and automation.

Consumer behaviour has changed a lot since the start of the health crisis: the lockdown has encouraged consumers to order online, shifting physical stores into e-businesses. This has driven changes in packaging:

- the size as it needs to fit small products and be stored in physical store that become fulfilment centres
- the purpose: to protect for transportation not from theft
- the communication as it is the only way to provide information to the final customer
- the perception of an eco-friendly material

Retailers have accelerated the implementation of omnichannel and cross-channel distribution strategy to reach the maximum number of customers using all available channels. customers are now used to it and some are not ready to return to physical stores. also, all the digital strategies developed to face this crisis will have to last and be improved to guarantee a customer experience as successful in store as online.

The covid crisis has forced companies to change their operations from sourcing to distribution of their products and services. This event, which no one expected, highlighted the limits of a globalized system where actors are interconnected and risks spread throughout the supply chain. The initiatives taken to face it, have significant positive consequences for the environment, if some companies do not see the benefits, others take the opportunity to put in place sustainable best practices that allow them to reduce their environmental impacts. Nevertheless, sustainability is everyone's concern and must be a priority for all stakeholders.