

# Chapter 41

## Impact of E-commerce on Corporate Sustainability—Case Study



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**Abstract** Sustainability (environmental, social, or economic) has become an increasingly present theme in our daily lives. This issue has been mobilising society and organisations to opt for more sustainable, ecological, fair and transparent behaviours. The E-commerce (EC) has experienced exponential growth in the last year and has become an activity that impacts environmental, economic and social sustainability. Through a case study methodological approach, the impacts of e-commerce on sustainability were analysed, considering the activity of a multinational company. We conclude that the impacts of e-commerce on sustainability can be both positive and negative and that they are related to several dimensions that are interdependent, such as packaging, logistic and product development. Companies have a self-interest to get compromised with sustainable development, as confirmed by the company under study, as they can shape, guide and report on their strategies, goals and activities, capitalising on various benefits. On the other hand, e-shoppers are more sustainability-conscious and demanding on issues such as transport (environmentally friendly delivery options) and packaging (sustainable packaging solutions). The study also concluded that the impacts of e-commerce on sustainability will be more positive the more committed companies are, with defined plans, goals and metrics.

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## 41.1 Introduction

Electronic commerce (EC) represents all transactions for the purchase or sale of products or services that occur using the Internet, the Web and applications and browsers. These transactions may occur through devices such as computers, mobile phones and tablets, to carry out business transactions, regardless of the payment system chosen and the product or service contracted. So, the EC consists of commercial transactions supported digitally, between individuals and organisations and between organisations among themselves. Thus, EC has several benefits for organisations, consumers and society [1].

The constant improvement of e-commerce is an effective way to support businesses and provide services with higher quality [2]. EC with social connections implies consumer-led online transactions, being a necessary aspect of business policy and a powerful accelerator of the economy [3].

Although the Internet allows the saving of certain resources, the truth is that e-commerce does not only have positive impacts. For every potential positive impact, there will also be a negative impact. The ease and convenience potentiate a higher number of purchases and, therefore, the Internet has increased the production of various products on a global scale [4].

The report “2021 European E-commerce”, carried out by the University of Applied Sciences of Amsterdam and Centre for Market Insights (CMIHvA), shows that in Europe, in all 27 member states of the European Union and 10 neighbouring digital economies, the turnover of the e-commerce sector had a growth rate of 10% compared to the previous year. By 2022, the trend is expected to continue—the study predicts a 12% growth and a turnover of 844 billion euros [5].

Despite most companies progressively employing sustainability plans, e-tailers in their online communication end up focusing on item bundling and promotional dynamics, concentrating on stimulating consumers to buy and less on raising shoppers’ awareness about the effect of accepting the natural world or supporting sustainable consumption and development models [6].

In this sense, sustainable consumption and development models have three fundamental components: environmental protection, economic growth and social equity. According to the United Nations Commission on Environment and Development, equity, growth and environmental maintenance are simultaneously possible and each country is capable of reaching its full economic potential while increasing its resource base [7].

This paper intends to analyse the impacts of e-commerce on sustainability through a case study methodological approach. Therefore, it is intended to understand, through the theoretical framework, several concepts, as well as, to find an analysis and discussion of the obtained results and respective conclusions.

For this reason, the following chapter presents a literature review of the topics in focus, with the purpose of providing knowledge that allows establishing the outline of the research to be conducted.

The third chapter explains the methodological option adopted, as well as the procedure used in the data collection and analysis phase.

The fourth chapter sets out the results obtained from the collection and analysis of the information from the semi-structured interviews conducted with 8 employees of the company under study, with an average duration of 30 min, as well as a discussion of the results obtained by comparison with the compiled theory and the general and specific objectives defined.

Finally, the last chapter points out some of the conclusions of the case study and presents the contributions, limitations and relevance for future research on the theme of this dissertation.

## 41.2 Literature Review

The literature review aims to understand the state of the art of the concepts of e-commerce and sustainability in its three scopes. In this sense, this exhibition reflects the main conclusions drawn from the scientific production associated with the theme of the impacts of e-commerce on environmental, economic and social sustainability.

Thus, the literature review assumed the reading and analysis of research related to the research question, involving the interpretation of the collected data. The databases used to collect the scientific documents were as follows: B-On (Online Knowledge Library), Google Scholar (Google Scholar), SCOPUS, RECIP (Scientific Repository of the Polytechnic Institute of Porto), Elsevier, Science Direct and Web of Science.

The literature review was conducted using the following search terms “sustainability” or “environmental sustainability” or “social sustainability” or “economic sustainability” and “e-commerce” or “digital” or “innovation” in Portuguese and English. Comprising the period between 2000 and 2021, privileging the most recent results since 2017. Additionally, reports from several identities, which due to their relevance, were crucial to these themes and were considered.

Relevant documents were identified through a careful analysis of the abstract, table of contents, keywords and introduction of each article. Simultaneously, the search was restricted to those scientific documents that provided the full content, as well as their thematic applicability for this purpose. Thus, after exporting all results, we proceeded to refine them; i.e. we sought to analyse only documents that were related to e-commerce in retail, as well as data relating to Portugal, since the company under study is national. The Portuguese company chosen is a market leader, listed on the stock exchange, operating in the food and non-food retail sector.

### **41.2.1 Sustainability in Companies**

The concept “sustainable” means to be bearable, capable of being maintained and preserved, if certain conditions are considered. In this sense, sustainability is a continuous, long-term process, which under certain circumstances maintains a stable system [8].

For the Business Council for Sustainable Development Portugal (BCSD) sustainability is a key theme for the competitiveness of companies and for their short-, medium- and long-term strategies, as it is increasingly a requirement of the various stakeholders and is related to the concept of sustainable development [9].

The “Our Common Future” report of the “Brundtland Commission” presented, in 1987, the definition of sustainable development—“it is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs, ensuring the balance between economic growth, environmental care and social welfare”. On the other hand, sustainable development is defined by Furtado [8] as a way of achieving better conditions, with quality consumption through harmonious, long-term relationships that contribute to the growth and development of the human community, with equity and guaranteeing the physical and biological quality of the ecological systems, which provide and guarantee the means for the sustainability of human society itself.

In this sense, sustainability, in a holistic approach, respects the environmental, social and economic dimensions. In this way, all must be considered to ensure lasting prosperity.

For companies, sustainability means having a business and quality management model, in the long term, keeping the company competitive, with guaranteed access to goods and services, through the preservation, conservation and replacement of resources and services provided by the economic, natural, human and social capital [8]. Thus, organisations should be concerned with social issues internal and external to the place where they operate.

### **41.2.2 Sustainability and E-commerce**

Dynamic Parcel Distribution’s (DPD) e-shopper Barometer 2021 revealed that some 82% of regular online consumers believe brands need to be environmentally responsible, but only half ensure they buy environmentally friendly products, and only 43% are willing to pay more for environmentally friendly products and services [10].

The study published, March 2022, shows that e-shoppers are increasingly aware of sustainability in e-commerce. About 65% of online shoppers consider that choosing eco-friendly delivery alternatives is important when shopping online [10].

Even so, the percentage increases when the issue relates to using low-emission vehicles, as 70% of e-shoppers say they are more likely to choose an online shop if it offers more environmentally friendly delivery options [10].

The speed and convenience of e-commerce have benefited from marked growth in recent years; however, this expansion has given rise to a range of issues related to environmental, economic and social sustainability.

### ***41.2.3 Environmental Sustainability and E-commerce***

The environmental dimension of sustainability is to ensure that natural resources are conserved and managed through actions that minimise negative impacts on air, water and soil, preserve biodiversity, protect and improve the quality of the environment and promote responsible production and consumption [9]. Taking into account the literature review on e-commerce, transport and packaging are the most relevant themes to explore in the environmental dimension of sustainability for e-commerce.

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The study published, March 2022, shows that e-shoppers are increasingly aware of sustainability in e-commerce. About 65% of online shoppers consider that choosing eco-friendly delivery alternatives is important when shopping online. Yet, the percentage increases when the issue is related to using low-emission vehicles, as 70% of e-shoppers state that they are more likely to choose an online shop if it offers more environmentally friendly delivery options [10].

From the consulted studies, the packaging and transport issues are the most relevant, as the reduction of packaging and the alternatives of less polluting delivery vehicles are two of the challenges for brands and transport companies to improve the environmental sustainability of e-commerce [11].

On average, 24% of the volume of an e-commerce order package is empty, so adopting new tools for optimising packaging, materials and handling technologies will significantly increase efficiency, sustainability and productivity across supply chains.

The sustainable use of packaging consists in checking whether the material chosen for it is the most appropriate one, based on the purpose for which it is intended, ascertaining the stages in which environmental impacts can be minimised, with a view to reusing and recycling the packaging material.

For 43% of Europeans, one of the greatest indicators of a brand's sustainability is the use of recycled packaging. The survey by Smurfit Kappa—Europe's leading corrugated cardboard packaging manufacturer—conducted in 2021, revealed that for 40% of Europeans the symbols appearing on packaging are one of the main sources of information they have about a company's environmental responsibility. The study involved 5028 European consumers from France, Germany, Italy, Poland and Spain and highlights the three main factors that influence the perception of sustainable packaging by consumers: packaging can be recycled (43%), packaging is

biodegradable (35%) and packaging is made of recycled materials (35%). Packaging thus becomes, in e-commerce, a tangible and visual proof of the commitment that brands have to sustainability [12].

The mission of logistics is to obtain the right goods or services, at the right place and time, and in the desired condition, at the lowest cost and with the highest return on investment. Economic and technological conditions act as a major lever of logistics development.

The requirements of fast deliveries tend to create situations where various means of transport deliver multiple orders without having their transport capacity fully filled. At the same time, e-commerce, due to its globalisation capacity, boosts faster means of transport which can represent high fuel and energy consumption and pollutant gas emissions.

The growth of e-commerce thus promotes innovation and sustainability in logistics. In short, the optimisation of processes, materials, new propulsion techniques and intelligent facilities are the great potential for logistics to become more environmentally friendly. It is important to modernise all touch points in supply chains, from a digital or consumer journey, to transport and delivery at the destination. Those who adopt new technologies and improve the workforce faster will have a competitive advantage in the market [13].

#### ***41.2.4 Social Sustainability and E-commerce***

The social dimension of sustainability indicates that human rights and equal opportunities of all individuals in society should be respected, contributing to the promotion of a fairer society, with social inclusion and equitable distribution of goods and focusing on the elimination of poverty [9].

Because of globalisation, producers in developing countries have been integrated into global supply chains and, at this moment, they have significant potential for improvement in the field of social sustainable development, as they are associated with practices such as child labour, excessive overtime, pollution, among others [14].

For companies, social sustainability is about how they contribute to the well-being of society, the context in which they operate and their employees. This way of being of companies should be transversal to the various stakeholders, such as, for example, employees, suppliers, clients and service providers.

Social sustainability in e-commerce is reflected in the design of digital assets that must be inclusive to avoid inadvertent exclusion of certain communities. At the same time, it is related to supply chains that must be fairer in both supply and distribution.

Inclusive innovation is a concept intrinsic to this dimension as it relates to the ability of businesses to create shared prosperity and enable access to quality goods and services at low prices, creating livelihood opportunities for excluded populations [14].

### ***41.2.5 Economic Sustainability and E-commerce***

The economic dimension refers to prosperity at different levels of society and the efficiency of economic activity, including the viability of organisations and their activities in generating wealth and promoting decent employment [9].

Sustainable attitudes benefit efficiency in management as they limit the consumption of materials, energy and water. There are advantages between sustainability and economy that influence the profit as also the financial and economic results of a company.

Allied to the economic sustainability of companies, the storage of certain products happens both to achieve advantages in the purchase price and to mitigate possible price increases. At the same time, there is also the advantage of transport costs that become lower when compared to the multiple transport of small quantities [15].

Without hurting the company's profit margins, inventories offer a quick response to demand needs, building customer loyalty and offering more competitive prices. However, inventories do not only have advantages for companies. Over time, this asset deteriorates and loses value. When there are risks of obsolescence and product expiration, companies feel the need to dispose of products quickly through the practice of significant discounts that reduce profit margins and contribute to the company's liquidity problems [18]. According to Cláudia Silva [15], inventories are an important item in financial statements and an important component in the management of any company.

## **41.3 Methodological Approach**

The case study is a method that seeks to understand complex phenomena while preserving the holistic characteristics of certain events. In this case, specifically, the case study aims to understand the impacts of e-commerce on sustainability that are dependent on several circumstances, which must be analysed within a context, i.e. the application of sustainable practices to e-commerce activity varies from business context to business context. Therefore, for us to be able to pose casual questions and conduct holistic and in-depth research, this phenomenon must be studied within the context in which it occurs.

As it is intended to establish a cause-and-effect relationship between the impacts of e-commerce on sustainability and the practices of the company under analysis this is an explanatory case study. Given the objective of this case study, the main data collection method consists of semi-structured interviews, as this format allows the flexibility to ask extra scripted questions whenever necessary [16]. Eight interviews involved respondents aged between 30 and 55 and with a range of time in the company between 2 and 15 years.

The interviewees occupy different functions. The choice focused on areas such as product development, packaging, as well as quality area managers with an active

role in supplier relations. In the e-commerce area, it was possible to interview digital development coordinators and brand managers. The interviews were conducted with the aim of collecting data about the employees' perception of social, environmental and economic sustainability associated with e-commerce.

The interviews lasted on average 30 min, in an informal environment and the interviews were audio recorded, with prior permission. The collection of information during the interviews is considered the criterion of theoretical saturation, which determines that the interviews should end as soon as the information obtained becomes repetitive, no longer adds new elements, contents, properties and connections between categories [17].

After the interviews had been conducted, the transcription verbatim was carried out using the recordings. Verbatim transcription consists of reducing the entire interview to writing in the interviewee's words and is, according to Merriam (2009), the best basis for further analysis.

After transcription, the interviews were analysed according to the principles of Grounded Theory, which aims to create a theory based on systematic data collection and analysis [18] i.e. existing data from the literature review (codified information) were compared with the collected data (uncoded information) and a conceptual framework was created with the aim of enriching the existing theory.

Grounded Theory goes beyond the mere verification of pre-existing theories or hypotheses and is embodied in the creation of theories about the social phenomena under study and is currently the most widely used method in qualitative research. This method provides for the creation of categories that emerge from the data collected, through a comparative stance between the existing codes and the information to be codified. The conceptual structure created allows for an enrichment of the theory, as connections are created between the different elements of the theory through the categories obtained [10].

## 41.4 Presentation, Analysis and Discussion of Results

According to the "Collaborative Report on Sustainability and e-Commerce" developed by E-commerce Europe, there is an opportunity to incorporate digitalisation as a key component of sustainability policies and vice versa. The e-commerce sector is a bridge between the digitalisation of society and its transition to a more sustainable economy. This is a constantly and rapidly evolving sector, shaped by new technologies, demands and capable of leading innovative sustainable solutions [19].

E-commerce should be seen as an opportunity to structurally change retail and consumer practices. Yet, the end-consumer remains crucial for the sustainable transition of e-commerce. In recent years, consumers have changed their behaviour and expectations to the extent that they are making more sustainable choices.



Online shopping can allow shoppers to benefit from greater transparency about product information, as certain digital tools can empower users. However, any information aimed at empowering consumers needs to be accessible, understandable, but also comprehensive.

The results obtained during the interviews are in line with the aforementioned information. The interviewees also considered that information, in e-commerce, is very important and should contain all the data about the product, namely origin, technical specifications, recyclability, certifications (if applicable), among others to combine information with the purchase decision process. Additionally, participants also listed several e-commerce features that could assist in communicating this information, such as banners, pop-ups, search bar and filters and product multi-photography with zoom to detailed and important information on the packaging.

This view agrees with Jones [6] who noted that the sustainable commitments of e-commerce can be enhanced by providing information on sustainably manufactured items and product life cycle effects at the point of sale online. E-commerce Europe warns that there is still no standardisation in the way sustainability information is presented, stressing that it is important that this basis exists but is flexible.

E-commerce packaging needs to be functional, protect the product and allow brands to implement their marketing strategies and, therefore, represents a challenge for e-commerce sustainability [19]. In this sense, the interviewees revealed several movements that the company under study has already made and is currently making—always starting from the assumption that the ideal is not to have packaging, opting to print all the important information directly on the product, and if packaging is needed opt for recycled, reusable and recyclable materials, with raw materials from sustainably managed sources.

The central part of e-commerce is logistics. It is interdependent on various themes such as mobility, urban planning, but also accessibility and is therefore shaped by various developments such as consumer expectations (e.g. delivery time), the growth of omnichannel commerce and transport infrastructure. Thus, the issues around this theme focus on pollutant gas emissions and urban congestion.

Interviewees indicate that the logistics chain of the company under study is extensive and that, therefore, fleet electrification, efficient transport and stock management may be ways to improve the company's ecological footprint, as well as, the construction of more sustainable last mile solutions, such as collection in physical shops or electronic lockers.

As of January 1, 2026, in Portugal, all national SMEs will have to comply with the European Commission Directive and will have to start reporting non-financial information in a more integrated, targeted, reliable and accessible way in order to support and encourage sustainable decision-making [20].

The data collected from this dissertation indicates that the company has well-defined metrics, communicated to the market and with concrete deadlines, such as elimination of PVC by the end of 2022; elimination of EPS by 2023; making all packaging recyclable, reusable and compostable by 2025 and use of at least 30% recycled raw material.

Sustainability is one of today's most pressing issues. Companies must rethink the way they produce, how they trade and how they sell to the final consumer, as they are part of a social, environmental and economic complex where collectively and individually they can help in the fight against climate change and resource rarefaction [19]. For João Meneses, secretary-general of the BCSD Portugal, there are several reasons for companies to be more sustainable, such as cost reduction, value chain optimisation, better risk management, differentiation of competitors from consumers and investment and business opportunities.

The Secretary General of BCSD 2020 noted that “sustainability is going to be a factor of positive differentiation and increasing competitiveness. Not only for consumers, but also for employees, as a factor in attracting talent”.

According to the interviews carried out, the organisation under analysis has sustainability as a priority, defining objectives with concrete deadlines and communicated transparently to the market. Even so, for the interviewees, a different importance is given to each of the aspects of sustainability. Environmental sustainability was the most mentioned by most of the interviewees and the one that allowed collecting the most examples. The social dimension was presented by most interviewees as the area of sustainability that can still be further explored. Economic sustainability did not meet consensus, since for some it is considered the most important for the company, while for others it is the one that has the least positive influence on the other areas of sustainability.

Economic sustainability represents the sustained economic growth of a company, with respect for natural resources, progressive reduction of the environmental footprint of products (full cycle) and equitably distributed wealth [21]. During the interviews, economic sustainability was associated with the cost of sustainable raw materials and, consequently, the margin of the products that impact the selling price to the final consumer.

Environmental sustainability represents the minimisation of negative environmental impacts arising from business activity—with the aim of creating positive impacts. To this end, it relies on a product life cycle approach, internalising good practices at all levels of the company's internal structure [21]. The data collected during the interviews demonstrates several actions in this area: mapping of all packaging, products and their components to ensure that it is known what needs to be changed, seeking to have recyclable, reusable or compostable packaging and products with at least 30% of recycled raw materials, from sustainably managed sources and with certifications.

According to the United Nations Global Compact, “directly or indirectly, companies affect what happens to employees, workers in the value chain, customers and local communities, and it is important to manage these impacts proactively”; therefore, the social aspect of sustainability mirrors the sustainable relationship that the company should promote in the human dimension—internally, but also for the benefit of society and the local community where it operates. According to the interviews carried out, in this field, the company tries to audit suppliers to ensure that there are no situations of forced labour, child labour or others, assessing the conditions of the

**Table 41.1** Summary table on the impact of e-commerce on the sustainability of the company (according to the interviewees)

Sustainability topic	Overall view	E-commerce topic
Environmental sustainability	Information, in e-commerce, is important and should contain all the data about the product. Several e-commerce features could assist in communicating this information, such as banners, pop-ups, search bar and filters. E-commerce packaging needs to be functional, protect the product and allow brands to implement their marketing strategies. The ideal is not to have packaging, opting to print all the information directly on the product, and if packaging is needed opt for recycled, reusable and recyclable materials (from sustainably managed sources)	Content marketing, logistics, packaging
Economic sustainability	The company has well-defined metrics, communicated to the market and with concrete deadlines	Reporting non-financial information
Social sustainability	The company tries to audit suppliers to ensure that there are no situations of forced labour, child labour or others, assessing the conditions of the factories and workers, while at the same time working internally on issues related to diversity and inclusion	Suppliers and employees

factories and workers, while at the same time working internally on issues related to diversity and inclusion (Table 41.1).

### 41.5 Conclusion

In short, it was possible to conclude that the retail company under study actively acts on the three aspects of sustainability although it does so with different intensities. Environmental sustainability was the aspect that received the greatest focus during the interviews. At the same time, some of the practices that the company under study

applies were identified, which have an impact on e-commerce and which contribute to the company's sustainability, as indicated by the following examples: supplier audits; definition of requirements and specifications for products and packaging; fostering recycling, reuse and durability of products; elimination of EPS, black packaging and PVC; betting on certifications and upcycling; making packaging recyclable, reusable and compostable; identifying the origin of products and raw materials; reduction of waste; use of recycled raw materials; reduction of packaging; detailed analysis of packaging and product components and optimisation of transport and stocks.

Through the interviews carried out, some limitations and opportunities for improvement were identified for the organisation that may impact on the sustainability of e-commerce. On the one hand, we highlight the following limitations: higher costs of sustainable raw materials; lack of dedicated recycling flows for certain raw materials; legal issues that impose certain forms of packaging for food vs. non-food e-commerce; extensive logistics chain. On the other hand, we highlight the following opportunities for improvement: lack of information regarding the sustainability of products on e-commerce platforms; greater focus on social sustainability, namely diversity and inclusion; use of various features to improve communication in digital commerce such as pop-ups, banners, filters, search bars, photographs and descriptions; innovating and seeking differentiating solutions; applying recyclability iconography in e-commerce on product pages; informing through e-commerce what the availability of the product is in physical shops to avoid unnecessary visits; electrification of the fleet and developing more sustainable last mile solutions.

E-commerce has both positive and negative impacts on the sustainability of companies. However, there are several steps prior to the e-commerce platform and transaction that need to be ensured to make e-commerce even more sustainable, of which we highlight the following: product development, packaging and the logistics chain. With the results obtained it was possible to enrich the existing theory. E-commerce is interdependent on several processes, and thus, for it to be sustainable, each of the parties also needs to be so. There is complicity between several aspects that influence e-commerce such as, for example, product and packaging development (design, materials, etc.), distribution, supply, among others.

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