

Review

Achieving Sustainable E-Commerce in Environmental, Social and Economic Dimensions by Taking Possible Trade-Offs

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Abstract: The Internet revolution has led to the advancement of online business all over the world. The environmental, social, and economic aspects are significant to the e-commerce sector, on both the retailer and consumer sides. It cannot be over-emphasized how important the sustainability of e-commerce in all three dimensions is. E-commerce will allow consumers to shop online easily, at any hour of the day, using secure payment systems; furthermore, trust in retailers' websites is of paramount importance to consumers. This calls our attention to the gap in previous studies, and consequently, the purpose of this study is to fill the gap, to ensure sustainable e-commerce in three dimensions; environmental, social, and economic. The question and aim under investigation are: How to integrate three dimensions into e-commerce to ensure that sustainability is achieved now and for future generations, while thriving as an industry? Collaboration is required, and all stakeholders in the virtual market must take appropriate responsibility. The methodology adopted is a review of previous studies done on each individual dimension of sustainability, since no joint studies have been carried out and integrated into the same literature framework. Furthermore, a case study involving companies in Kenya and Jordan is used in order to collect empirical data. The findings of the study show that: First, integration is essential for the sustainability of e-commerce in its three dimensions; second, trade-offs must be taken in the various dimensions in order for companies to realize sustainable e-commerce. This will go in hand with the realization of the maximum benefits of integrating the three dimensions in e-commerce to make it more sustainable. In conclusion, by applying these aspects of sustainability in e-commerce, it is clear that everyone wins. This is achieved by improving and safeguarding the quality of life by protecting the environment, preserving natural resources, and maintaining and sustaining the economy. The implications of the study are that, in order to make e-commerce more sustainable, to make decisions and take action, social/environmental/economic aspects must be considered as a fundamental element, and must be treated as a group and not separately as in previous studies. In this way, we can realize greater benefits, not only in online business sustainability, but also in policy-making and environmental protection, while companies will create economic value as well as avoiding labor unrest.

Keywords: e-commerce sustainability; environment; social; economic; consumer; trade-off

1. Introduction

With the growing number of people taking advantage of e-commerce businesses today, and the range of products available and the possibility to compare prices, customers have moved a notch higher, and now always demand green or sustainable e-commerce shopping [1]. It has become more necessary than ever before to establish a business brand, and not only attract, but keep customers while taking these three factors into consideration when shopping [2]. This will enable a company to build lasting relationships with customers as end users, and it will reduce barriers that e-commerce enterprises have not yet been able to overcome [3]. The Internet has changed the perspective of doing business for both retailers and consumers [4]. One can shop from the office, at home, in the car, or on the train, and the goods are delivered at home, which saves time and is convenient. Buyers and sellers are able to compare prices from the various websites in different countries, although pollution and the emission of carbon dioxide gases are harmful to the environment. Therefore, a trade-off is required to ensure positive impacts outweigh negative ones [5,6]. The rapid and continuous growth of e-commerce cannot be discussed without talking about its sustainability [7,8].

Since companies all over the world are involved in e-commerce, there is a need to ensure that their activities do not put the world into jeopardy by endangering sustainability [9]. They need to preserve the environment, avoid environmental destruction, and ensure the continuation of humankind [10]. Where sustainable development is not ensured, then there will be negative consequences that may lead to the depletion of the ecosystem. Therefore, companies will need to adopt user friendly features that will make customer relationships easier. The growth of e-commerce has led to an increase in orders delivered to customers resulting in high emissions of CO₂ and even greater traffic congestion in cities. The e-commerce delivery of B2C goods accounts for 61% of the current total e-commerce shipments, which has led to increasing environmental pollution [11]. This is not expected to be reduced at any time soon because of the increase in the number of online shoppers and retailers. Every day new online businesses are born [7,12], which results in high demands on the distribution of goods causing environmental harm if not checked. According to Arnold et al. [11], high emissions lead to the deterioration of the environment, affecting both the environment and its inhabitants. The e-commerce sector must therefore put emphasis on sustaining the environment by pressuring logistic service providers (LSP's) to lower their cost-driven prices and provide other transportation alternatives where possible to support their businesses. The primary objective of retailers is to focus on economic gains, and to generate profits and revenue economically. This can be done by taking possible trade-offs in the economy, environment, and society that result in greater benefits [13]. However, neither a company nor a country can achieve sustainable economic development without putting the environment at a risk. Companies note that, for their survival, they need to balance their actions with the three dimensions of sustainability of e-commerce, if sustainability is to be realized [13,14].

Previous studies have shown there is a need to balance and increase knowledge for sustainable e-commerce in virtual market places. The previous studies ignored how to integrate the three dimensions of sustainability of e-commerce and take any possible trade-offs. For this reason, this study concentrates on investigating how companies can integrate all these dimensions for more sustainable e-commerce, which will benefit consumers, retailers, and the environment alike. It will try to answer the following questions/statements, as it is expected that the results, discussions, and recommendations in this study will be of relevance in addressing the question of how integration makes e-commerce more sustainable by the acceptance of trade-offs.

- How will it be possible for online businesses (e-commerce) to integrate the three dimensions of sustainability to ensure ecosystem preservation in today's business?
- What are the best possible trade-offs available for companies to adopt sustainability in the three dimensions of e-commerce?
- What recommendations can be made to ensure more sustainable e-commerce?

Figure 1 illustrates the conceptual framework of independent and dependent variables.

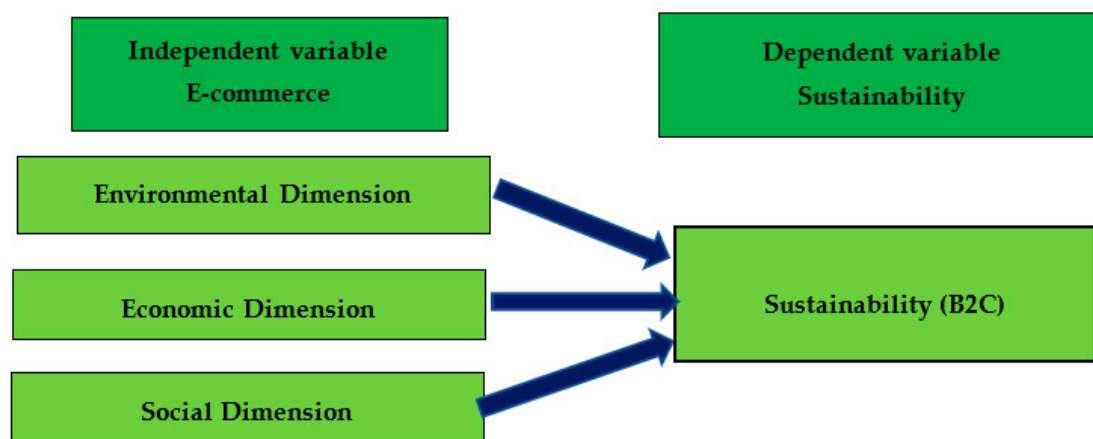


Figure 1. Conceptual framework. Source: Authors' own editing, 2018.

The main aim of this study is to investigate how to integrate the three dimensions of e-commerce to make it more sustainable by taking possible trade-offs that will bring maximum benefits to retailers, consumers, and the environment [15]. This is because, in previous studies, these three aspects have not been combined, but studied separately. This study makes a new contribution by looking at the following trade-offs: Social-economic; economic-environmental; and environmental-social. In addition, we highlight in Table 2 that the advantages of e-commerce and sustainability outweigh the disadvantages. This gives a green light to making better recommendations to governments, retailers, policy makers, and consumers. With this in mind, we try to discover e-commerce solutions for the major challenges, such as pollution, labor unrest, and increases in production costs [16,17].

2. Literature Review

This chapter presents an in-depth understanding of the subject matter by filling the gap in the literature by first discussing the development of e-commerce. The Internet revolution will enhance the environmental, economic, and social sustainability of e-commerce.

2.1. Development of E-Commerce

The e-commerce revolution and the advancement of technology is changing the way business is conducted [18]. The recent census bureau estimates released by the U.S. show online sales have doubled over the last two quarters, from 15.8% to 30.2% and \$142.2 million in 2017, compared to the previous year, and this is expected to triple in the next year [19]. This is the same in China, Europe, and Africa, and to a great extent in Kenya, followed by South Africa and Nigeria. E-commerce is experiencing exponential growth due to the high penetration of the Internet and a high number of mobile subscribers. Globally, e-commerce is growing and doing three times better than expected. This has been facilitated by the use of smart-phones, which are readily available at a lower cost compared to some years ago. However, this has posed a great challenge to merchants to keep up with consumers' demands, which are changing with time [20]. Similarly, the challenge of shipping goods from one location to another has increased environmental hazards to communities, not forgetting that after delivery some products are returned to the suppliers, simply because they do not meet the green product expectations of consumers. Consumers are becoming more aware of the need to prevent this situation and therefore urge e-commerce companies to adopt sustainable solutions [21]. This presents a good opportunity for companies to comply with e-commerce sustainability in three dimensions—environmental, social, and economic—to facilitate future sustainable e-commerce [1].

2.2. Working in Partnership to Drive Sustainable E-Commerce

Manufacturing companies, logistic service providers, retailers, and consumers must work together to enable e-commerce to attain sustainable solutions in the process of manufacturing, packaging, transporting, and reducing shipment returns, in order to ensure a favorable environment [22]. Coming together will reduce the cost of operations, and the cost of goods, shipment and recycling, and so the economic aspect will be advantageous to all stakeholders.

In this approach online businesses will be working towards a green environment [23]. Proper packaging will reduce returns, facilitate deliveries, and use minimum packaging, and customers will be willing to pay a high price for goods that come from companies that support a green environment. Where proper packaging is used this will lead to less greenhouse gas emissions and will have positive impact to reduce global warming [2,24]. Laudon and Traver [25] argue that it is the duty of every party to conserve the environment. This cannot be left to companies alone as their sole aim is not only to maximize profits but also to bear in mind consumers and social needs, as they also provide employment and protect the environment [26].

Online business (e-commerce) is dependent on the development and use of the Internet. The Internet can be defined as the connectivity of computer devices using a network—whether public or private—to advance communication, transactions, and transfers of funds, among other activities. The Internet was discovered in the early 1990s and put to use later when the world wide web (www) was registered and used by Amazon to sell goods [26]. E-commerce involves all the electronic transactions between an organization and other stakeholders. For example, consumers will place orders over the Internet and the company will do the delivery through a third party as a logistic service provider [25]. According to Lee [7], the Internet has added several advantages to e-commerce as it has brought more competitiveness to the e-commerce industry in the following way: E-commerce can be done anywhere, 24/7 (24 hours in a week), so long as there is internet connectivity, thus overcoming geographical limitations. It is cost effective to both retailers and consumers by offering a range of products and services to be chosen from. E-commerce has been fueled by social networking where customers are able to complain and get feedback immediately via the e-services and e-support given by salespeople on e-commerce platforms. Interactions between companies and consumers have been made possible since consumer demands keep changing over time. The Internet has brought with it an immense density of information, which is accurate, timely, and cheaply accessible over the Internet for comparison purposes, i.e., there is free trade and no barriers to entry to the market. It offers high personalization to customers on the basis of data collected during their previous shopping behavior [27].

B2C, which is a business transaction between a business and consumers over the Internet, is the most frequently used model [25]. B2C is growing exponentially at a steady and rapid rate even though it is affected by the distribution channel used to deliver the goods to the consumer after the placement of orders [28]. In addition, it is heavily over-burdened by distribution characterized by high investments in software and hardware and the need to create awareness among consumers [29]. Consumers require faster and high-quality services, therefore requiring companies to put more focus on customer relationship management to keep and attract new customers [24]. Services must be of high quality and time-reliable, resulting in a positive delivery. In addition, Yang et al. [30] urged that firms and consumers should monitor processes to reduce carbon emissions by firms producing green products and consumers making fewer returns. This was also supported by research on how to have optimal carbon reduction and strategies for fewer returns, which in turn support sustainable e-commerce by creating green products and a safe environment to live in for businesses, consumers, and the wider environment [31]. According to Kostakis et al. [15] and Fourcroy [32], a balance between the growth of e-commerce businesses and the resulting environmental-social negative effects should be maintained to ensure less harm to the society through pollution.

2.3. Dimensions of Sustainability in E-Commerce and Trade-Offs

Companies, consumers, and society follow sustainable regulations, which are increasingly becoming very important for the world as a whole [33]. It is not possible for any stakeholder to be concerned with only one dimension because all the three dimensions of sustainability must be focused on when identifying consumer purchase perceptions, as well as the available trade-offs that will bring benefits in both the short and long term [34]. Society, companies, logistic service providers, and consumers should all work to realize sustainable outcomes, which will also enhance overall financial, social, economic, and environmental performance [35]. Unfortunately, there is no universal, standard way of incorporating sustainable e-commerce into a business strategy, and that is where trade-offs become important [36]. It is even difficult for different companies to apply a strategy in different countries since each country has unique regulations that suit their country. This is why countries and companies need to come together and create harmonious regulations that can be applied to the entire world [37]. Sustainability will be considered an effective way for companies to remain competitive and attract and retain more consumers in virtual market places [38]. At the same time, it will increase operational performance, efficiency, and effectiveness, and minimize resources usage and costs, and benefit society by providing less harmful products and services in the best possible form [39]. This can only be realized as e-commerce continues to experience constant growth, while at the same time, there is an increase in air pollution [40] that should be mitigated by raising awareness [41].

For companies to reach and keep customers worldwide they need to consider whether their actions are sustainable for the business, environmentally, socially, and economically [10]. A basic definition of sustainable development would be the following: “The basic sustainable development is to consider whether the needs of and the impact of traders are in equilibrium with the ecosystem’s ability to produce and recover”. It can also be defined as a development that works to ensure that there is continuous preservation of natural resources for future generations [39]. Firms will produce green products and merchants will sell what conserves the environment and the ecological system. Bratt [21] argues that there is no specific definition of sustainability; what it means depends on the subject matter under discussion. Similarly, for e-commerce to be more sustainable, the three dimensions of e-commerce sustainability must be put into practice [42]. Sustainable development is the key to sustainable ecology in the environmental dimension [43]. Sustainable e-commerce innovation by technological change can go two ways. It can result in positive or negative impacts but in all cases the positives should outweigh the negatives. Firstly, it might bring financial advantages and enhance environmental sustainability. Then again, it can present genuine difficulties for this sector and create burdens for both people’s livelihoods and for environmental sustainability. The process of discovery reveals that ongoing innovative advances in the assembly sector may prompt vital economically favorable circumstances, for example, increased profitability and enhanced balances of trade, as well as social (e.g., new employment, gender empowerment, decreases in poverty, finance-related considerations, and so on) and environmental (e.g., reduced ozone depleting substance discharges, enhanced air quality, decreased utilization of packaging materials, and so forth) benefits. This where the trade-offs take place to ensure mitigation with positive impacts [16]. However, these developments may result in negative effects for the economy (e.g., high costs, lack of efficiency, low demand for products), for society (e.g., joblessness, problems for general wellbeing, gender imbalance, increasing poverty, and so on) and for the environment (e.g., negative effects on biological communities, pollution in the environment and water contamination in nearby areas, and so on). This leads to negative impacts if not acted upon in a sustainable way [3,44]. Therefore, to achieve a win/win/win solution (i.e., econ/environ/social) from technological improvements, it is important to create integration strategy methods that will deal with the full scope of the positive and negative results of sustainable e-commerce. The sector has failed to accomplish this goal up to this point, principally because of a lack of information and policies. Additionally, there is a lack of green practices, IS alignment, and the kind of environmental performance that can result in coordination and mitigation [17,45].

A few techniques might be utilized to mitigate the trade-offs emerging from innovative technology in the e-commerce sector. For example, putting resources into training, creating social assurance frameworks, executing viable work administrations, creating satisfactory business security, and putting resources into open joblessness protection plans might be valuable reactions in terms of econ/social trade-offs that will expand profitability/yields and reduce the unemployment created by these kinds of trade-offs. The end result will be to create an econ/environment strategy that supports a win/win action that is appropriate to avoid increasing ecological dangers related to the environmental aspects of online shopping malls.

A sustainable development strategy may likewise assume a key role in ensuring that technological change in the assembly sector cultivates econ/enviro/social development as well as social inclusiveness and environmental sustainability. Structuring a rational development strategy is still a major test for online shopping malls and consumers. Giving importance to enhancing and diffusing innovations that help support and improve sustainability will enable synergies in minimizing trade-offs and maximizing the benefits of the economic/environmental/social measures taken to achieve sustainable e-commerce developments.

According to Freeman et al. [46] and Edquist et al. [47] innovations in technology would have positive impacts not only on employment, but also on effective and efficient methods of production. This is because when new green products are produced at a lower cost, there will be high demand for creation of job opportunities. On the other hand, the use of new technology may result in stress-related diseases [48,49]. At the same time, Schipper and de Haan [50] and Williams [51] indicated that when good re-usable packaging material is used, this is a benefit in environmental conservation [52]. However, the noise caused by operating these machines can cause health problems, which is why a balance must be created to ensure the positive impacts outweigh the negative impacts in the long run [53]. While it has also been highlighted that the use of renewable energy contributes positively to a great extent, allowing the community to use solar power, biogas, and improved cooking stoves [54–59], by the use of telecommunications companies will assist in a transformation from negative energy to positive renewable energy [24]. However, this will still pose challenges in terms of carbon dioxide emissions, which, if not taken care of, will suffocate the environment.

The important thing is to develop policies that support minimum trade-offs and maximum benefits in the econ/enviro/social strategy for e-commerce business sustainability. The policies must be developed keeping transparency in mind and coherently weighing all options that will protect the economy from ecological degradation and keep it socially viable [60]. Governments may join with e-retailers, researchers, and experts to ensure these suggestions are implemented at different levels, i.e., markets, society, governments, sectors, and economies.

Another way of looking at this is by using industrial symbiosis (IS) which attempts to create an econ/enviro/social balance, which is both efficient and effective, and operational at all levels of industry. This ensures resources are shared equally, i.e., that firms are operating efficiently and effectively, the environment is preserved and is able to regenerate itself for future use, and that socially consumers are supplied with green products and services that do not endanger their lives. Suggestions on the policies that e-retailers and vendors can adopt include the following:

1. Adopting the best econ/economic/social win/win/win solution will be the best opportunity to utilize technology to the best level so that consumers will enjoy a good online shopping experience [61] and—by ensuring retailer websites can be trusted by customers—will promote customer loyalty rather than mistrust [62,63].

2. Enhancing customer satisfaction so that they put their trust in the e-retailer, and ensuring website design 3D shopping influences customer loyalty [63].

3. Creating a positive customer attitude towards online shopping and increasing the urge to shop online every time a chance is available [64]. Using a social gratification interface would also provide positive impacts on consumers who use social networks to get feedback from their peers on the products that they have purchased online to fulfill social needs and maintain social links [65].

The perceived values of online shopping agree with this study that when customers acquire trust in e-retail websites they can spend more time to add items to their shopping carts while browsing in social media platforms [66]. Otherwise, mistrust will lead to the abandonment of online shopping [62].

2.4. E-Commerce and Environmental, Economic and Social Sustainability

Sustainability awareness is of great importance in e-commerce. Researchers and practitioners have asked how environmentally aware online shopping malls are, and which measures can be implemented for green-minded customers [10]. All aspects are connected to each other and a company cannot choose to deal with one and omit another. Concern for the environment involves natural resources, packaging materials, carbon dioxide emissions, water pollution, and soil contamination. Companies should ensure that their activities will not lead to depletion of and damage to natural resources [67]. Dealing with the production process, products, and services means not harming living creatures before, during, and after use of the product, and thus ensuring life continues [13].

The support for a green environment and products contributes to the health of sustainable e-commerce consumers [68,69]. This brings consumer satisfaction (Sullivan and Kim [70]), and in the same way, builds trust on the part of the consumer [7]. It has been established in previous studies that the growth and increase of e-commerce results in impacts on the environment, which are both negative and positive [71]. For instance, when consumers place orders with various companies, companies must agree with logistics service providers to deliver the goods at once, since the company will concentrate on economies of scale to reduce costs. However, studies show that transport increases pollution, emissions, and congestion, which has a negative impact on the environment. Similarly, there are increased deliveries and returns to companies with unrecyclable packaging. Most of the negative impacts can be minimized by planning and using the most efficient delivery channels, and by collaborating by putting all deliveries going in the same direction into the same unit and sending them at once with an alternative transport system [37].

According to Reference [11], due to the increase in e-commerce, environmental impacts will continue in cities unless consumers put more pressure on companies to comply with safety regulations and mitigate delivery times. This approach will lead to more sustainable e-commerce business development solutions that emerge to make use of economies of scale. Companies can borrow approaches in different countries that use other delivery methods. For example, Sainsbury's supermarkets in the UK converted their delivery fleet into electric vans and China is using electric bicycles for shorter distance deliveries [72]. Similarly, home delivery can be done by using other means of transport that do not emit carbon dioxide in urban centers, for example, using public transport such as trams [73]. This will give possible benefits to the environment and society [74]. Turning negative impacts into positive impacts will lead to more sustainable e-commerce and ecology.

Economic sustainability is defined as the way companies should economize available resources to attain maximize profits and ensure a good revenue for stakeholders [75]. It means that companies should not only focus on short term goals but also on long-term goals by ensuring customers can see value for their money and be satisfied with their purchases. For this to happen, retailers need to be in touch with the consumer, changing behavior and preferences by investing in social media to get direct feedback. The economic dimension also requires companies to produce quality products and services at the least cost and package them in reusable packaging to avoid polluting the environment. In accordance with a sustainable e-commerce agenda, organizations comply with SDG (Sustainable Development Goals)'s (2017). Products should also be green products that are friendly to the environment.

E-commerce is very successful because of its low-cost, efficiency, high sales, convenience, and the easy methods it provides for personalizing information according to consumer shopping behavior and exploiting the availability of social networking through social media, which e-commerce companies use to promote their products [76]. Due to its high efficiency and effectiveness, e-commerce has proved more advantageous and led to economic growth, increased profitability, increased customer bases,

and increased value added to output, and hence resulted in sustainable production activities. It is not automatically guaranteed that e-commerce will provide a 100% profit because it includes the cost of setting up software programs and hardware, which is expensive in the initial stage (launching stage); most of the time this is a sunk cost [30]. Therefore, the question is how to operate a sustainable e-commerce business and enjoy maximum profits, while ensuring environmental protection against deterioration and depletion [77]. Sustainable e-commerce can be attained by better utilization of assets, and controlling factory production and administration costs, and by flexibility in responding in a timely manner to consumers' changing demands and thus enhancing the level of customer satisfaction, loyalty, and trust through customer service support [78]. If e-commerce companies cannot sustain and fulfill customer requirements, customers may abandon online shopping and go back to offline markets [70]. The economic benefits of e-commerce are evident to the entire world and made possible by integrating the three dimensions of e-commerce sustainability.

Trade-offs can be defined as a position in which parties benefit and take advantage of their capabilities to achieve the results they wish by turning negative impacts into positive impacts. In order for companies doing online business to become more sustainable, they need to evaluate strengths and weaknesses. According to Slack et al. [69], companies need to consider and evaluate the possibility of improving their performance by taking the best trade-offs. However, this must be considered carefully, otherwise these trade-offs might create a negative impact on the company's productivity and efficiency [69]. The essence of trade-offs is to make decisions that create the most benefits by involving all three aspects of sustainability. Thus, companies and consumers will be said to have made the best trade-offs and so made e-commerce more sustainable in the three dimensions of sustainability [79]. Sooner rather than later, e-commerce will be conducted in every community in the world, making life more sustainable so long as there is Internet connectivity.

The social aspect includes human needs and cultural development [80]. In this dimension, it is a concern how e-commerce will impact on consumers in a positive way. Consumers want better health, a green environment, and socially responsible communities in the daily conduct of online business activities [74]. In addition, one cannot forget CSR (Corporate Social Responsibility) and business ethics in day-to-day activity [81]. The problem today is that the actions taken by human beings to meet their needs damages the future capability to generate other resources [80]. The most important entrepreneurial ecosystems in the world have significant positive impacts on the economies and societies in which they operate, fostering innovations and economic sectors, and generating quality employment. At the same time, online firms involved in e-commerce (e-business) should understand the importance of humankind in its continuous existence [16,82].

Companies are using social media to create awareness and communicate with their customers all over the world. However, e-commerce has given birth to social innovation [83]. Information technology and communication has enabled better communication [84]. Funds are transferred when conducting e-commerce, which makes it easy for transactions to take place without the two parties involved in a transaction meeting [85]. Transactions have fulfilled social needs to a great extent by improving life conditions for consumers. By using social media, local people are marketing their local produce, and selling it through e-commerce platforms, hence sustaining their lives and reducing poverty levels in different countries, as well as earning a livelihood [86].

The Internet has crossed regional and geographical boundaries leading to sustainable social-economic development and also averted the economic disparity evident in society [87]. In another sense, developing countries can participate in e-commerce activities, where previously, without e-commerce, it was impossible to achieve social and economic development. Digitization and e-commerce have provided a livelihood throughout Africa, where young people and university students are able to do online jobs, not only for themselves but to serve the entire world through digital literacy [15,88]. E-commerce has more positive than negative effects on the environment, economically and socially, as people live in the global virtual market [89].

2.5. Trade-Offs between the Inter-three Dimensions of Sustainability in E-Commerce

Sustainability can be defined as “meeting the needs of the present generation without compromising the ability of future generations to meet their own needs”. When it comes to describing sustainability, we need to be concerned about three main areas of influence, which are interconnected spheres that describe the relationships between the environmental, economic, and social aspects. These are a related set of concepts forming a solid ground from which major decisions can be made and actions taken. Examples include land use planning, surface water management, building design and construction, and even law making. When the three spheres of sustainability are applied to real world situations, everybody wins. Natural resources are preserved, the environment is protected, the economy is not harmed, and the quality of life for people is improved or maintained. Table 1 explains trade-offs between the three aspects of sustainability in e-commerce that can make it more sustainable now and in future generations/businesses.

Table 1. Trade-offs between the inter-three dimensions of sustainability in e-commerce.

Dimensions of Sustainability	Subjects of Realeated Articles
Social—Economic	Fair taxation [31]
	Business ethics [9,81]
	Trade [86]
	Workers’ rights [83,90]
	Government spending [60]
	Product longevity and durability [91]
	Recycling/re-use of products [22]
	Taking care that hazardous waste can be re-used in production [76]
	Use of less pollutant emitters of gases - bicycles [13,30]
	Electrical trains [13,31]
	Use of renewable energy to save energy [54–59]
	Replacing goods and equipment when broken beyond repair [92,93]
Economic—Environment	Empowerment and equity [38]
	Energy efficiency [38,39]
	Subsidies/tax breaks [31]
	Carbon credits [13,30]
	Growth and productivity [7,70,71]
	Eco-label products [21,91,94]
	Quantity and quality of packaging [75,95]
	Product recyclability [91,96,97]
	Favouring of forefront companies supporting green e-commerce [98]
	Quality of materials of the commodities used [75]
	Product repair eligibility [38,92,93]
	Quality retailers goods [38]
Environment—Social	Energy efficiency in product manufacture and use [38]
	Use of services instead of owning goods [37]
	Resource management [87]
	Environmental protection [77,99]
	Habitat restoration and preservation [39]
	Promoting a healthy lifestyle [54]
	Social participation [87]
	Global poverty reduction [57,86]
	Elimination of public health risks [54]
	Consumers’ social responsibilities [27,100]
	Communality [87]
	Equality and tolerance [38,43]
	Use of job opportunities [38]
	Eco-system integrity and biodiversity [67]

Source: Authors’ own editing, 2018.

Table 2 shows a summary of the advantages and disadvantages of e-commerce and sustainability.

Table 2. E-commerce and sustainability—pros and cons.

Dimension	Advantages	Disadvantages
Environmental	Reduced individual consumer journeys and emissions [71]	Increased number of shipments and journeys [93]
	Flexibility and integration of LSP's [101]	Increased greenhouse emissions [71]
	Increased use of mobiles for enhanced sustainable e-commerce [102]	Increased amount and types of packing [74]
	Revenue earned by the government through the LSP's; harmony and collaboration created between all the sectors (ICT, LSP's & govt) enhances development in revenue collection [101]	Removing possibilities of maximizing packages [74]
	Larger markets, better financial performance and competitiveness [103]	Companies enforce minimum compliance with laws and regulations [94]
	Efficient production processes, increased economic sustainability [103]	Lack of trust in e-commerce e-retailer's website leads to unsustainable environment [104]
	Better productivity and economies of scale among sectors [103]	Health related diseases [56] Ground & service water contamination [54]
	Companies change transportation fleets into alternative electric vehicles [37,105]	Soil erosion & pollution [54,56]
	Corporate social responsibilities from companies to consumers [100]	Direct deforestation [54]
	consumers more prepared to pay high prices, to buy green products [98,106]	Lack of e-waste dumping sites, may result in contamination of soil, water and livestock [54]
Economic	More consumption of green products [107]	Increase in GHS emissions [56]
	Reduces cost and increases profits [37]	No guarantee in financial performance [30]
	Economic growth [76]	Can lead to initial or devastating losses [30]
	Operational and innovation performance improvement [108]	High competitiveness and high pressure [33]
	Increased flexibility regarding customer requirements [78]	Vital to gain customer loyalty, which can be difficult [70]
	Global reach of customer and other companies [109]	Companies do not make it easy to create environmental sustainability when they do not uphold and comply with environmental protection policies; priority on making profits [99]
	Positive effect on the welfare of the customer [76]	
	Growth in labor productivity [76]	
	Reduced search costs, making it easier to find accurate prices [37,70]	
	From economics of scarcity to economics of abundance [11]	
	Growth in e-commerce has been enabled by the use and adoption of the Internet and cheaply available mobile phones [110]	
	Reduces geographical barriers [111]	
	Consumers spending more on online shopping when based upon website customer satisfaction and trust [93]	
	Corporate innovations have led more firms to engage in e-commerce, hence more business income [112]	
	More involvement of different sectors in attaining a green product/service agenda for m	

Table 2. Cont.

Dimension	Advantages	Disadvantages
Social	Global communication and knowledge transfer [25,83]	Increase in individualistic resource consumption behaviour [87]
	Enables and makes companies make more social innovations [113,114]	Increases economic disparity [87]
	Creates links between developed and developing countries [20,115]	Job losses for white and pink collar workers [88]
	Creates job opportunities for entrepreneurs and people with digital literacy [88,116]	No face to face interaction with customer [28]
	A 24/7 open economy which is operational outside holidays [117,118]	Poor design of website with difficult navigation on online shopping sites will make customers irritated and abandon their shopping [119]
	Renewable energy, wind can be used for turbines instead of gas [54–57]	
	E-retailers need to ensure that their website is secure to earn customers' trust [7,70,104]	
	Global customer service and support to bring satisfaction [113,120]	
	Easily accessible information through networking between company's management and consumers [113]	

Source: Authors' own editing, 2018.

2.6. Consumer Awareness and Collaboration

Currently, consumers are very much aware of the necessity to preserve the environment well. In the same way, companies should be willing and ready to package their products and services in a sustainable manner; packaging should be reusable, or the company can introduce a policy to buy it back [95]. In addition, transportation policy should consider using the most efficient form that does not pollute the environment [121]. This will ensure that there is minimal or no harm at all to the environment, since consumers are endeavoring to achieve a green economy. In economic terms, companies will be able to save on costs when they are able to rebuy the packaging material at low cost. Similarly, when packaging companies should try to collaborate and put together all goods that are going in the same direction, to be delivered at once. For small packages companies should adopt what China is doing by delivering with bicycles, which will also reduce the emission of carbon dioxide gases. In a collaborative sense all stakeholders are brought into the bigger picture, i.e., it is a duty for everyone—retailers, logistic service providers, consumers, and society at large—to conserve the environment [87]. This collaboration aspect, even with competitors, which is known as co-opetition, is worth emphasizing [91,96]. An effort by society to conserve the environment will reduce most of the problems faced by the world today; for example, global warming, pollution, and catastrophes associated with diseases [97]. This will work hand in hand with the sustainable agenda of the World Economic Forum by enforcing the SDG's policy developed in the 2017 summit discussions. A collaborative approach will enhance the three sustainability dimensions in order to achieve optimal economic–ecological–social solutions to reduce the negative impact on the environment [87]. Sustainable development requires the integration of ICT (Information and Communications Technology), which is a problem and at the same time a solution for e-commerce sustainability. Economic sustainability does not always lead to a deterioration in e-commerce, but rather strengthens synergy efforts to overcome geographical and regional barriers, where customers and e-retailers can benefit from e-commerce despite their location [92]. The stakeholders involved are leaders who will be involved in strategy and planning, employees who carry out the actual processes, and consumers, who are the end users of the green products that the organization is expected to

produce. This will conserve the environment, as well as bringing e-retailers more sales and hence high profits, while consumers will enjoy healthy lives.

3. Data Sources and Methodology

A case study is a way of checking a special phenomenon and is a good method to find a proper explanation and an in-depth understanding. Interviews and questionnaires allow researchers to deal with a large amount of evidence [122]. It is important to know if there is a need to make a multiple or a single selection for the case study. Many points of view can show how conditions change over time. According to Yin [122], the multiple case study can give a better explanation because it provides the expected results of multiple sources of data collected [110]. In this respect, a multiple case study on e-commerce and sustainability was chosen for this study. Table 3 shows the criteria used to select the e-commerce companies.

Table 3. Selection criteria for the companies.

Companies	E-commerce	Accessibility	Sustainability
A	✓	✓	✓
B	✓	✓	✓
C	✓		✓
D	✓		✓

Source: authors' own editing, 2018

Two of the four companies in Jordan and Kenya have been selected upon the basis of criteria related to e-commerce and business activities. The other two companies have a lack of accessibility and for this reason have not been selected. This study will not show the names of companies for confidentiality reasons. Company A works in the virtual market, whilst company B has a physical store (offline store) and a virtual store (online store).

Following Bell and Waters [123], semi-structured interviews were used in this study. The semi-structured interview contains two types of questions: Predefined open questions and closed questions [124]. E-commerce and sustainability are the main topics of the interviews used in order to obtain a deep understanding of e-commerce and sustainability.

Table 4 illustrates the selection criteria for targeted respondents in the companies. Three interviews were conducted in order to get sufficient data. Company A conducted one interview, while company B conducted two interviews. Company B is a much larger company than company A.

Table 4. Interview data.

Interviews	Company	Interviewees	Data	Duration/min
1	B	Sustainability Manager	2 September 2018	30
2	A	CEO	4 September 2018	35
3	A	HR Manager	4 September 2018	28

Source: authors' own editing, 2018

Before starting the interviews the aim of the study was explained to the respondents to make them feel comfortable and aware of the questions and express themselves without any reservations. This decision was taken to show respect, understanding, and interest in the respondents, and to encourage them to talk freely [125,126]. Questions had been sent to respondents previously. In Jordan, the interviews were conducted in Arabic, while in Kenya in English to eliminate any language difficulties and misinterpretation. The interviews were conducted at company A's premises and permission was given to record the interviews to ensure that the correct material and information was used. The duration of each of the interviews was approximately 30 minutes.

A telephone interview was conducted with company B because of the ease of access, speed, and lower cost. This type of interview is effective and more convenient. The disadvantages and difficulties of telephone interviews are establishing trust and a personal connection over the telephone [125]. The interview was prepared for by an e-mail sent in advance and the opportunity to record the interview was requested so the company had a chance to prepare and review the questions.

Additionally, one of the strengths of the data collection is multiple sources of evidence such as the companies' websites and company B's sustainability report and sustainability policy report, which made it possible to understand the answers better, and allowed the researchers to cross-check the answers with the data on the views and aims of the companies from their websites.

According to Yin [122] and Gibbs [127], every interview should be recorded and transcribed (i.e., in Arabic and English) so that it is easy to analyze. The pattern used in this study is the analytical technique. First, each company was analyzed and classified separately according to the interview carried out. Secondly, all the data were cross-analyzed to strengthen the robustness of the findings. Thirdly, triangulation with website information (and for company B, data from the sustainability report and from the sustainability policy report), the literature review and the interviews were used in the data analysis, giving multiple sources of evidence as well as several angles of analysis. To be able to visualize the analysis in a correct manner, a model is provided in the analysis section, which is a compilation of both empirical material and literature.

4. Results

4.1. E-Commerce and Sustainability (Company A)

Today, e-commerce has boomed globally but still its sustainability represents a major challenge to stakeholders. The travel sector is taking the lead, as well as fashion and electronics, which have doubled over previous years and are expected to triple in the following year; however, to ensure this occurs, the challenges associated with sustainable e-commerce must be addressed. There is increasing environmental pollution [71], higher production costs [93], and labor unrest [94]. Therefore, the stakeholders in these relevant sectors should work together to mitigate the challenges through the benefits of e-commerce. Here, we look at the case study in companies A and B, to analyze, interpret, and compare the results.

Company A is an e-commerce retailer in Kenya with over 20,000 different products and 73 employees. The company is mainly active in Kenya, but in recent years has expanded to Nigeria and South Africa, with additional plans to expand to Asia. Company A works in virtual marketplaces and it is not present in any physical stores. It has one warehouse, which allows customers to access goods, purchase, and place orders. Company A is planning to establish physical stores. If the company adopts the idea of building the stores they will be "concept stores" or experiential stores, where customers can experience the products, as well as buy them. Company A has a stated vision for the company and a mission for a long run strategy, but their aim is to become the biggest actor in the field globally.

The company pays attention to building trust with consumers and making fast and accurate deliveries. Three days is the maximum time to deliver the goods to customers. Moreover, the company cares about its image and reputation and offers several ways to deliver the goods, via post and home delivery. In addition, the company offers alternative delivery methods with less environmental impact on pollution, including by sea and rail. This aspect contributes to the environmental dimension in trying to mitigate pollution and the emission of carbon dioxide gases.

In order to meet customers' needs related to more sustainable products, company A has extended its portfolio of products. In other words customers have alternatives from the same group of products. Companies should communicate their sustainability policy to their consumers through their websites. These policies could include the CSR that the company is undertaking to support a sustainable green environment, e.g., planting trees, providing job security and marketing green products with recyclable packaging materials. To save material the company reuses packaging before sending it to the customer,

although this action is not so common with customers so the policy was stopped. A Regional Economic Partnership Agreement (REPA) has been signed by the company with the packaging company, which uses recycled material and so the company sells the packaging (i.e., the old packaging). Thus, cost saving, improved and efficient use of resources, and so the reduction in waste, allow us to achieve a green friendly environment that will comply with the norms and internationally accepted behavior of SDG's 2017, which is accompanied by a reduction in natural resources and energy consumption, and obtaining environmental credentials with suppliers and partners, thus ensuring the protection and conservation of the environment.

The economic dimension plays an important role, relying on trade-off activity as a motivating factor for the company; cost efficiency leading to technology improvement creates energy efficiency, long term financial competitiveness, and increased market share [125]. In order to remain efficient and effective, the company uses sea or railway lines for shipping goods, which is considered to take more time at a low cost, and in addition, is friendly to the environment. Another trade-off is between time and cost savings. The company gives economic incentives by offering discounts to consumers to select substitute and complementary products, therefore increasing market share and the customer base.

Interaction with customers is done via the website and customer service. The telephone line is essential to support customers and customers can make enquiries or report a problem with the product. At the warehouse, the employees and customers can meet when the customers pick-up their products. This company contributes to a more sustainable society and wants to help people with disabilities to get jobs. The importance of this, is that the company has an open door policy. It is ready to listen to its consumers and take corrective action when need be, and at the same time getting direct feedback regarding improvement.

4.2. E-Commerce and Sustainability (Company B)

Company B is a Jordanian retailer with approximately 100 stores scattered around Jordan selling shoes and other similar products. As from 2013, the company is also available in the virtual marketplace to reach the wider mass of the population as products can be delivered all around Jordan. The company has partnerships and collaborations with suppliers and external brands. Physical stores and the virtual store work together as an integrated feature. With the online store it is possible to test different collections and brands to see if the market is receptive to the new products or not. The online stores also encourage growing demand because, apart from consumers, even the physical stores can place orders in the online store if a particular size or model is not available. The company has four element sustainability dimensions: environmental, economic, social, and quality. Collaboration and awareness are important advantages since one cannot do everything individually, but all must work together.

The environmental dimension should not adversely affect natural resources over time. The company seeks to work with suppliers and partners to reduce its environmental impact and must strictly avoid using substances that affect either human beings or the environment negatively. Similarly, railway transportation has been used by suppliers as an alternative shipping method to reduce time-to-market and environmental pollution. This is important because trade-offs can be realized, and proper pollution management will lead to habitat restoration, better livelihoods, natural resource management equilibrium, and an attempt to attain positive growth economically.

As regards ensuring a good financial position for company B, the economic dimension provides resources to sustain the company in the future. Despite the growth in sales of the company, sales of online and physical stores have decreased. As interaction with the consumer is the main core for the company, they are actively looking to develop new ways of interactions by trying out new "concept stores" to create an experience while shopping. Thus, high sales are realized.

According to the sustainability report of the company, in order to enhance returns on investment and economic sustainability they will work more towards a circular economy.

The company has a social responsibility for the well-being of consumers, and more so to its employees who are affected by the company's activities, by offering a hospital. This aspect of trade-offs

its important because it means the workers are guaranteed safe working conditions and good health. Having a hospital ensures good health, and the company is not wasting any resources or time by sending its workers to seek medical attention somewhere else. In return, efficiency and proctivity is achieved. The strategy of the company declares that it is important to contribute to a better world, mostly in the countries they are involved in. They focus on street children and by educating and supporting them they can give future generations a better life. The company occasionally donates clothes, shoes, and other consumables. It is also engaged with a humanitarian aid organization to collect and donate shoes that are not saleable.

The quality dimension is considered another important dimension of sustainability. The company tries to provide customers with real information on how to extend the lifespan. Once the products cannot be repaired anymore, the company buys them back for two reasons. First, to avoid pollution of the environment, and second, to recycle waste to make new shoes. Again, this represents a cost saving and reduction in resources.

4.3. Summary of E-Commerce and Sustainability (Company A and Company B)

The definition of sustainability was not known by the respondents in company A. Company A does some sustainable activities, but customers do not know this because of a lack of communication on the website. Therefore, there is a need to create greater awareness, both among the company's employees and consumers. Company B uses its website to publish the sustainability report and there is a department dedicated to working on sustainability factors and sending updates to members.

Customers have become more conscious of the effect of their decisions and purchasing behavior, so both companies A and B feel pressure from customers to achieve sustainability. Customers are becoming more aware of how to be friendly to the environment. In order to choose green products, customers need to be informed, educated, and motivated, regardless of the high price of the product.

Economic sustainability is created by customer satisfaction. We can observe that both company A and company B have good support from their customers. Both company A and B work closely with their suppliers to obtain high-quality materials for their products. Company B is working with suppliers on a long-term planning horizon to use shipping by sea, which is time-consuming, but both economically and environmentally friendly.

The findings reveal that the social dimension has been adopted by company A and company B and both are working to improve it by offering equal job oppotunities, better living standards, good working conditions, and efficient resource management, as well as smart growth and preservation of the environment. This trade-off will make every stalkholder a winner in the end, and thus attain sustainability in e-commerce.

4.4. Importance of the Results of Sustainable E-Commerce in Environmental, Social and Economic Dimensions by Taking Possible Trade-Offs

The study shows that e-commerce is rapidly becoming a bigger factor in the economy globally. The study has showed how e-commerce firms can integrate the three intra diminsions to ensure sustainability. They can achieve this by taking all available econ/environ/social trade-offs in order to maximise their benefits, by engaging all staff in carbon-neutral improvement activities, and by providing better job security and improved ethical behavior with partners and suppliers [16]. This is illustrated by the two companies, A and B.

Regardless of their success, the companies should focus on and look to develop omni-channel strategies to sustain and maximize growth opportunities over the coming years. Buying online requires a higher level of trust and therefore retailers should ensure their websites are consumer protected. Additionally, they should engage the government in discussions to improve policies and regulations on sustainability in the three dimensions of e-commerce. This includes strengthening the business case and supporting initiatives for green companies-products-environment, digital literacy,

more internet connectivity, financial inclusion, and ease-of-doing business. This will result in equal job opportunities, smart economic growth, and compliance with environmental policies.

5. Discussion and Conclusions

E-commerce is much more than another method of working together; it is another worldview and an essential element of competitiveness. As e-commerce business develops, there are still questions regarding how it can be managed from an environmental, financial, and social point of view. The aim of this study was to investigate how the three dimensions of sustainability can be incorporated within the e-commerce sector to make it more sustainable.

In this holistic approach, e-commerce will realize sustainability, whereby companies will not only realize the economic gains, but will also have contributed to environmental and social aspects. They will achieve this by conserving the environment and providing job security for their employees, who in turn will work with total commitment since they will not be worried about looking for greener pastures [16].

Communication has been shown to be key in sustainable development as everybody should be encouraged to remember why one should act sustainably and which important trade-offs should be made.

For the most part organizations need to inform clients why they should choose more sustainable products and how these items or the organization itself can influence environmental, economic and social sustainability. Therefore, this will give the consumers a positive perception and influence purchasing behaviours towards companies that support sustainable e-commerce.

Customers need to demand more sustainable items and friendly environmental activities from organizations. An organization can promote sustainability by the use of economic motivating factors e.g., low costs, quality products and additionally reduced transportation charges. The trade-offs show that companies can make a great difference and sustainability is possible if every stakeholder is involved in the process of sustainability. Therefore, all stakeholders will have a win/win solution. In such a situation it will be easy to come up with policies that support sustainable e-commerce and create synergy between customers, retailers, government, and policy makers.

The contribution of this study is the unification of the three dimensions of e-commerce as regards sustainability and its importance to both retailers and consumers. This will deepen the knowledge in the literature and add more weight to the effects or negative consequences for the environment of failing to balance the three dimensions. It will also highlight the importance of companies realizing the increasing demands consumers have vis-a-vis sustainable e-commerce. It will also be able to show that there are some trade-offs that do not cause damage to companies or consumers. In the end, the ecosystem will receive great benefits as firms will enjoy cost efficiency production, and workers will enjoy better working conditions in a clean environment, and there will thus be a major move to e-commerce sustainability [17].

Academic researchers at large can benefit from this study through the new knowledge it provides to the existing literature. Furthermore, it draws the attention of all stakeholders to how to integrate the three dimensions of sustainability into an e-commerce business. In addition it will take into consideration the fact that businesses can make trade-offs that will be beneficial and provide insights for further research that can be conducted on sustainable e-commerce. This study is limited to e-commerce with organizational structure levels including an analysis of two case studies from Kenya and Jordan. The analysis generalized the results of the two companies in the two countries to show an overall picture of sustainability in relation to e-commerce. A case study was used as the methodology; however, more qualitative and quantitative methods should be used in the future for a better analysis and explanation.

In the future researchers will carry out more analysis on Industry 4.0 and the three dimensions combined with trade offs to find out how to ensure sustainable e-solutions. In addition, internet and technology do not guarantee or determine sustainability but rather the design, use and policy

regulation put into use daily. This study has its limitations. Results of the two case studies from Kenya and may not depict the true picture globally hence more methods and case studies should be used to get wider perspective. Similarly, a comparison analysis of sustainability in e-commerce in emerging markets and developed countries such as China, Hungary, US and Switzland with giant online malls like amazon, ebay, alibaba.com etc. may lead to a better understanding of this topic. Furthermore, it is highly important to consider horizontal and vertical intergrations across continents to give a global outlook. Last but not least it makes sense to analyze e-commerce sustainability in different categories like fashion, electronics, FMCG, Tech, accessories, sports and travels.

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