economies

*Review*

# Analysis of the Impact of the Pandemic on the Growth, Use, and Development of E-Business: A Systematic Review of the Literature

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**Abstract:** The COVID-19 pandemic has affected various sectors in multiple countries, among them the economic sector has been one of the most affected, so the search for tools or measures for the continuation of sales and processes became recurrent, finding in e-business and its components precise tools to counteract the situation. Therefore, the present research aims to analyze the impact of the COVID-19 pandemic on the use, growth, and development of e-business by conducting a systematic literature review using the PRISMA methodology, collecting scientific articles covering the period of the pandemic from databases such as IEEE Xplore, ScienceDirect, Scopus, EBSCO, and IOPScience. Despite the limitations in access to scientific articles, it could be concluded that within the main characteristics identified, e-business tools in general allowed many businesses to continue subsisting and making sales thanks to the increase in online users due to the COVID-19 lockdowns. Although it was identified that the adoption of these tools lacked policies, limitations, and supports from governments, the perception of their use was positive in that they were considered safe and efficient.

**Keywords:** e-business; e-commerce; COVID-19; systematic review



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## 1. Introduction

In the current global context, we are not oblivious to the impact that the COVID-19 pandemic had and still has on several important sectors such as health and the economy, the latter being cataloged as the greatest economic crisis in more than a century, triggering an increase in inequality both internally and between countries. Emerging economies and disadvantaged groups will require more time to overcome the human and economic losses caused by the pandemic, which, despite having implemented economic policies at the time, generated new risks, such as the increase in the public and private debt of the world economy, endangering the equitable recovery of these, according to a report presented by the World Bank (Mundial 2022).

This situation was reflected in several companies around the world that had to look for ways to continue to survive, according to a survey conducted by the World Bank (Mundial 2021); in addition, in relation to human resources, only 11% made personnel layoffs, and about 65% made adjustments in relation to the salary and schedule of workers, in terms of technology. The results show that 34% of companies increased the use of social networks, the Internet, and digital platforms, and only 17% of them decided to invest in the acquisition of new technological devices, computer programs, or digital solutions. This situation is shown especially in countries with economies categorized as economies of scale and with digital platforms, and only 17% of them decided to invest in the acquisition of new technological devices, computer programs or digital solutions, the Internet, and digital platforms. Further, only 17% of these decided to invest in the acquisition of new technological devices, software, or digital solutions, a situation that is shown especially in

small businesses and in countries with economies classified as poorer, where more than 70% of companies said that lack of information was the main impediment to accessing assistance.

Another situation was reflected in those high-level organizations that were already digitally ready, according to a study by the Economist Intelligence Unit, commissioned by Microsoft (The Economist Intelligence Unit 2023). By the time when the pandemic had hit, they already had a head start on how to deal with the new challenges it brought, as they had tools and platforms that allowed them to make changes in the way they worked, interacted with customers, and recalibrated supply chains, and as the pandemic spread, their digital infrastructure allowed them not only to stay competitive from a business perspective but also to respond more nimbly to societal changes. On this, 72% of respondents reported that the pandemic has driven digital advances in their respective sectors to keep pace with digitally focused companies, not to mention the challenges faced by nondigitally prepared organizations, who needed to look at the implementation of digital tools from a more open point of view and not focus only on the pandemic as a means to implement them (Bermeo-Giraldo et al. 2022; Supari and Anton 2022).

Although the implementation of digital tools or digital transformation oriented to the management of processes within companies is not a new reality, the challenges involved in their implementation are in constant change in the era of the COVID-19 pandemic, when uncertainty and difficult times inevitably accelerated the process of digitization (Coskun et al. 2022; Villa and Monzón 2021). Organizations had no choice but to resort to these measures regardless of the positions and previous experience they had in relation to digitization processes, although not all were prepared with respect to their resources (Almeida et al. 2020).

Section 2 details the methodological process of collecting articles. Section 3 contains the results and features the characteristics of the selected articles and their analysis. Section 4 contains a discussion that answers the research questions. Section 5 proposes a model to follow. Section 6 lists similar review articles. Finally, Section 7 presents the conclusions.

## 2. Methodology

This research was carried out through a systematic review of scientific articles, searching them in various databases, using the PRISMA (preferred reporting items for systematic reviews and meta-analyses) statement, which was designed to help authors of systematic reviews transparently report why the review was performed, what they did, and what they found, from a set of 27 structured items, including a flowchart on the process of detecting scientific articles (Page et al. 2021).

Following the PRISMA declaration, this section is structured as follows: (1) type of study, (2) research questions, (3) search strategy, and (4) inclusion and exclusion criteria.

### *2.1. Type of Study*

A systematic review of the literature will be used to prepare the article.

### *2.2. Research Questions*

The proposed research questions are as follows:

RQ1: What measures or changes regarding the implementation and/or use of e-business were adopted after the pandemic?

RQ2: What impact did the pandemic have on the growth of e-business tool adoption and on establishments or companies that had already adopted e-business tools prior to the pandemic?

RQ3: How did the pandemic influence the perception of e-business usage?

### *2.3. Search Strategy*

To answer the research questions, articles published in the following databases were searched: IOPScience, EBSCO, ScienceDirect, IEEE Xplore, and Scopus.

Regarding the search strategy applied, specific keywords in relation to the research were used, such as "e-business", "e-commerce", "electronic business", "pandemic", and "COVID-19", within the search engine of the databases, allowing the use of search equations to refine the search and obtain more-accurate articles for this investigation. These words had to be found in the title, abstract, or keywords according to the search criteria of each database. Likewise, use was made of the databases' own filters, such as the selection of the range of years, type of publication, and language, in order to better direct the research.

After searching the databases by using the search equations and applying the filters described in Table 1, the articles were reviewed to select those relevant to the research, as shown in Figure 1, where more articles were collected from the Scopus database.

**Table 1.** Search strategy.

| Database | Search Equation | Additional Filters |
|---|---|---|
| Scopus | "e-business" AND pandemic<br>"e-business" AND COVID-19<br>"electronic business" pandemic<br>"electronic business" COVID-19<br>"e-commerce" COVID-19 | Year range: 2020–2022<br>Type of publication: conference paper, article |
| ScienceDirect | "e-business" AND "COVID-19"<br>"e-business" AND "pandemic"<br>"electronic business" AND "pandemic"<br>"electronic business" AND "COVID-19"<br>"e-commerce" AND "COVID-19" | Year range: 2020–2022<br>Type of publication: conference paper, article |
| IEEE Xplore | | None |
| EBSCO | | Language of publication: English, Spanish, Portuguese |
| IOPScience | | None |

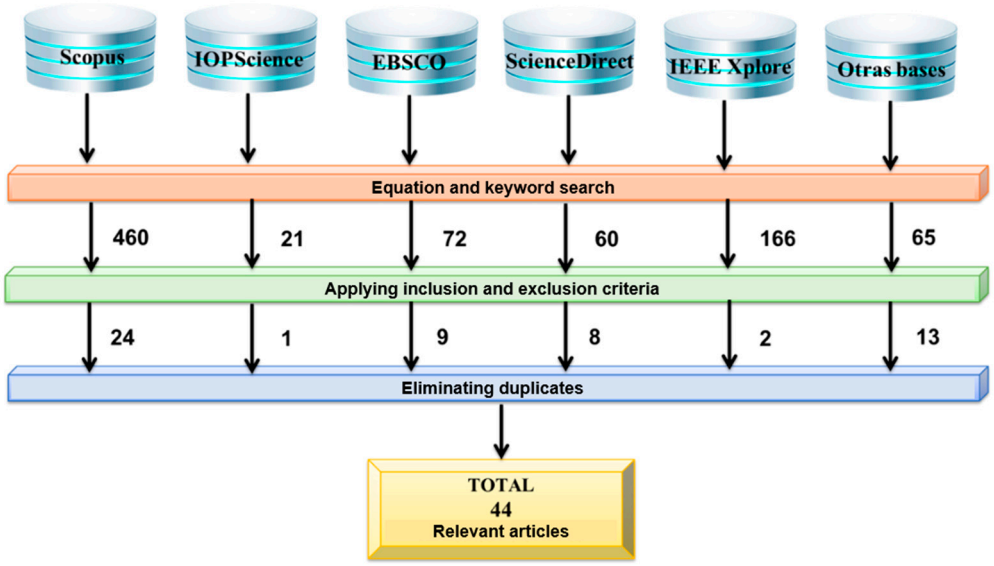


**Figure 1.** Information resources.

In total, 844 scientific articles were found after the search in the databases, to which the exclusion criteria had to be applied, verifying the duplication of articles between the results of the databases and the relevance to the research topic, leaving 44 articles relevant to the research, as can be seen in Figure 2, which shows how the selection process was carried out by applying the PRISMA methodology.

Regarding the selection of the articles, the following inclusion and exclusion criteria were taken into account, as shown in Table 2.

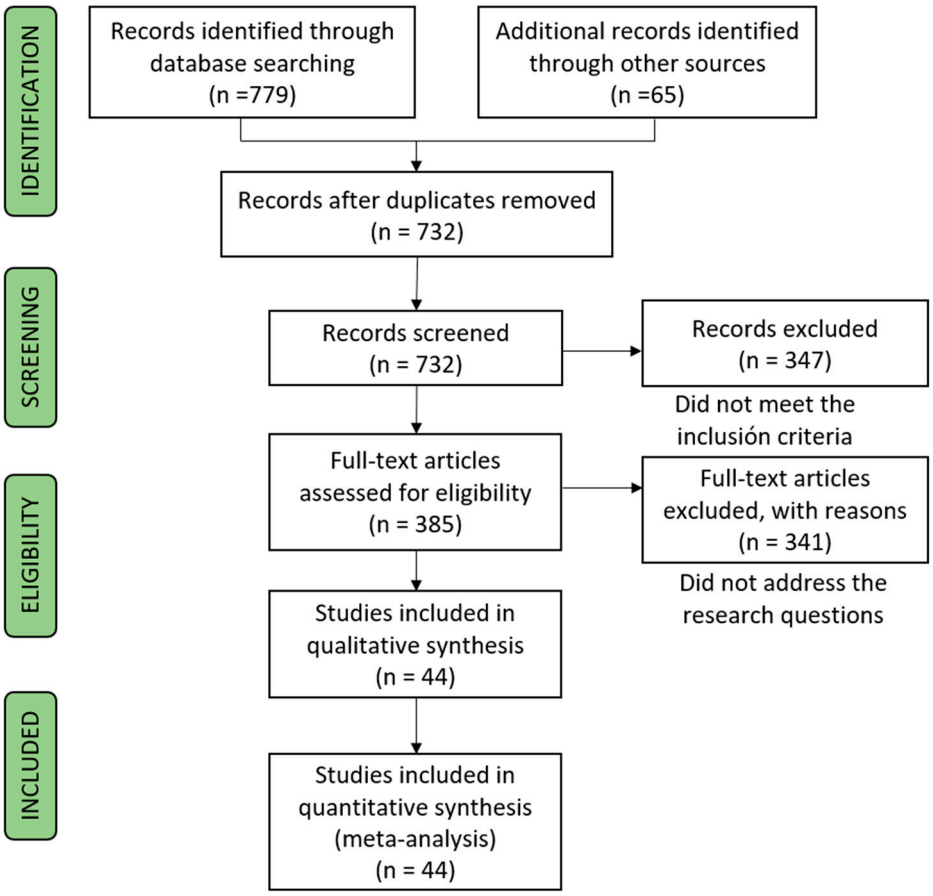


**Figure 2.** Inclusion and exclusion criteria.

**Table 2.** Inclusion and exclusion criteria.

| Inclusion Criteria | Exclusion Criteria |
| --- | --- |
| I01 Be written in one of the following languages: English, Spanish, Portuguese, or Italian. | E01 Language other than those mentioned in inclusion (English, Spanish, Portuguese, Italian). |
| I02 The research should be within the 2020–2022 range (include pandemic time). | E02 Not scientific. |
| I03 Articles must be scientific articles. | E03 Not related to the impact of the pandemic on the e-business sector. |
| | E04 Not having full access to the item. |
| | E05 Not related to the research questions. |

## 3. Results

In the present systematic literature review, 732 articles obtained from the various databases were analyzed. After applying the PRISMA methodology, as shown in Figure 2, 44 scientific articles were obtained with significant information for the present research.

Figure 3 shows the number of articles obtained in relation to the databases where they were obtained by using keywords; more articles were found in the Scopus and EBSCO databases.

Likewise, one of the criteria taken into account at the time of obtaining the articles was the range of years during which the COVID-19 pandemic has taken place, as shown in Figure 4, whose distribution was made by year and database. A higher number of publications was expected in 2021.

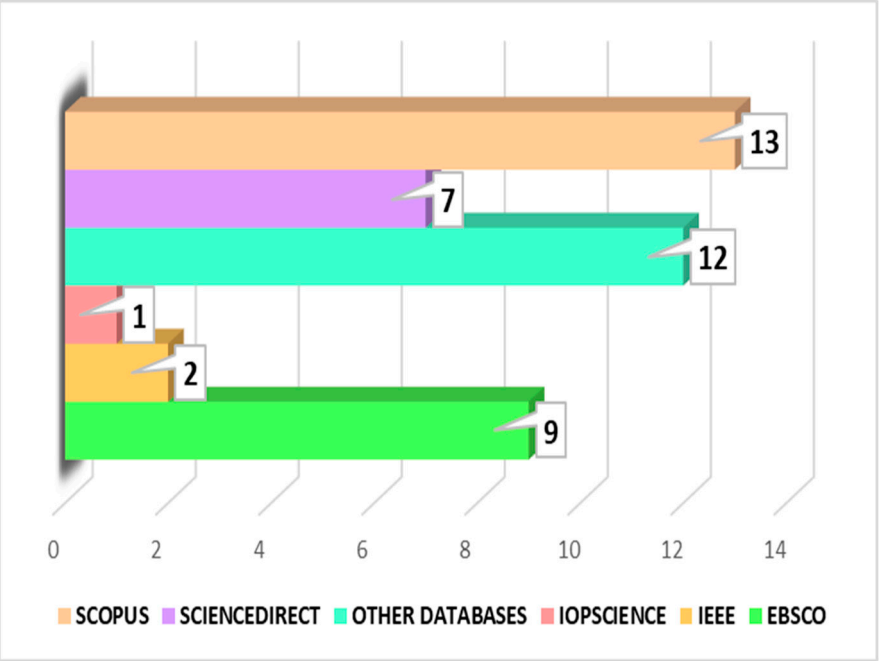


**Figure 3.** Articles grouped by database.

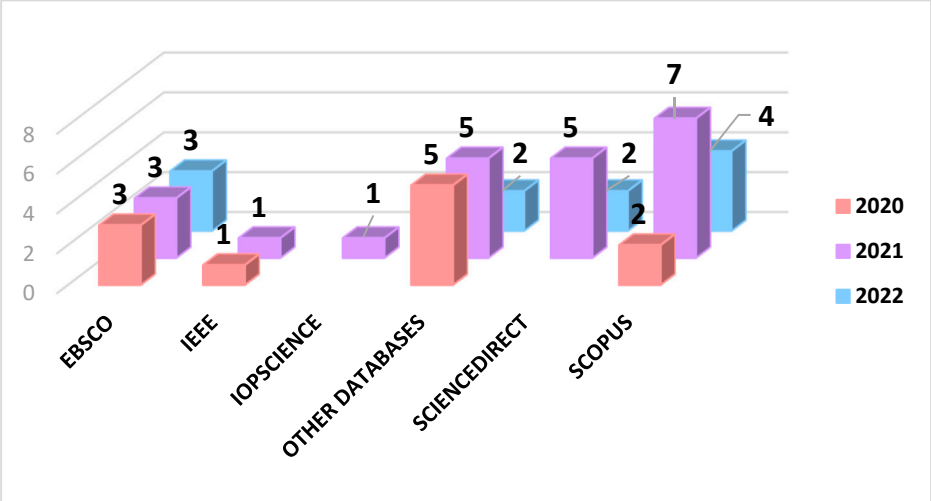


**Figure 4.** Articles grouped by year and database.

On the other hand, an important characteristic of the articles obtained is the country of research, China, which presented the largest number of articles relevant to the research questions posed in this study, as can be seen in Figure 5.

Similarly, the research presented in the articles covered countries from different continents, as can be seen in Figure 6. Asia was the continent with the highest number of research papers.

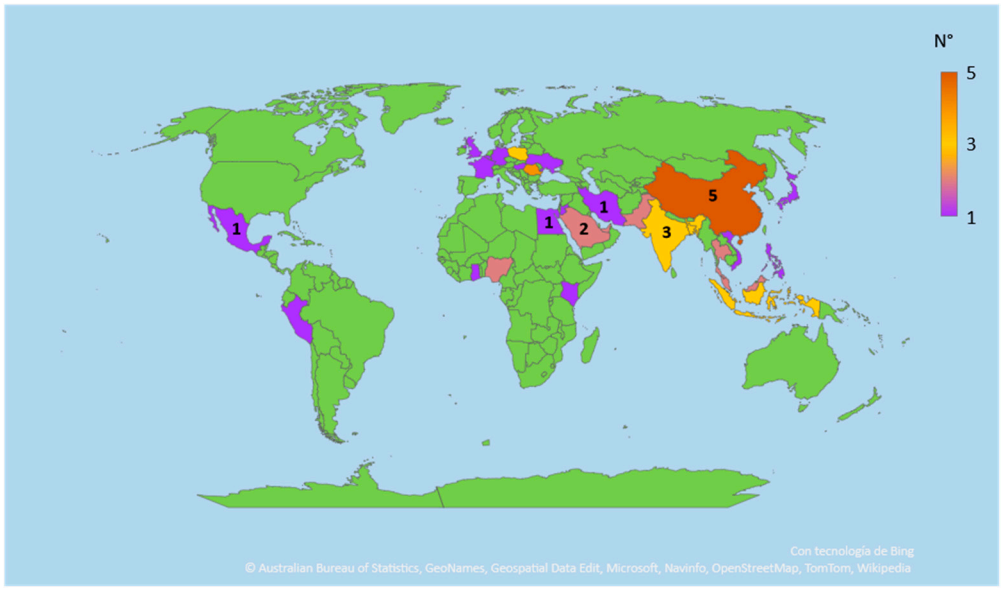


**Figure 5.** Articles grouped by country.

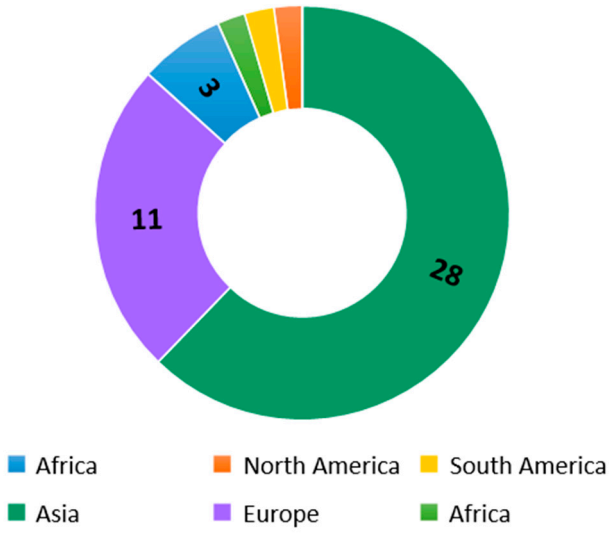


**Figure 6.** Articles grouped by continent.

In addition, we proceeded to perform a bibliometric analysis. This type of method is used with the objective of providing a quantitative analysis of the written publications, based on the identified collection of writings of an author (corpus) within a specific thematic area (Ellegaard and Wallin 2015). In the beginning, it focused mainly on bibliographic overviews of scientific productions, whose summaries had subdivisions in relation to authors, topics, or bibliographies, sometimes including a variety of broad topics and sometimes focusing on specialized topics. They cover a wide variety of materials: journal articles, theses, books, patents, and even gray literature reports.

The tool used to carry out the bibliometric analysis was VOSviewer, which, according to its page (VOSviewer 2023), allows the construction and visualization of bibliometric networks, which may include journals, publications, or studies whose construction can be related to the citation of bibliometric coupling, coauthorship or cocitation, as well as the construction of networks by finding important terms (keywords) extracted from the text of the scientific literature.

Figures 7–9 show the results of using the VOSviewer software to carry out a bibliometric analysis on important terms (keywords). Figure 7 shows a bibliometric visualization

network of four keywords from the articles selected for the research, highlighting the formation of three clusters, detailed in Table 3.

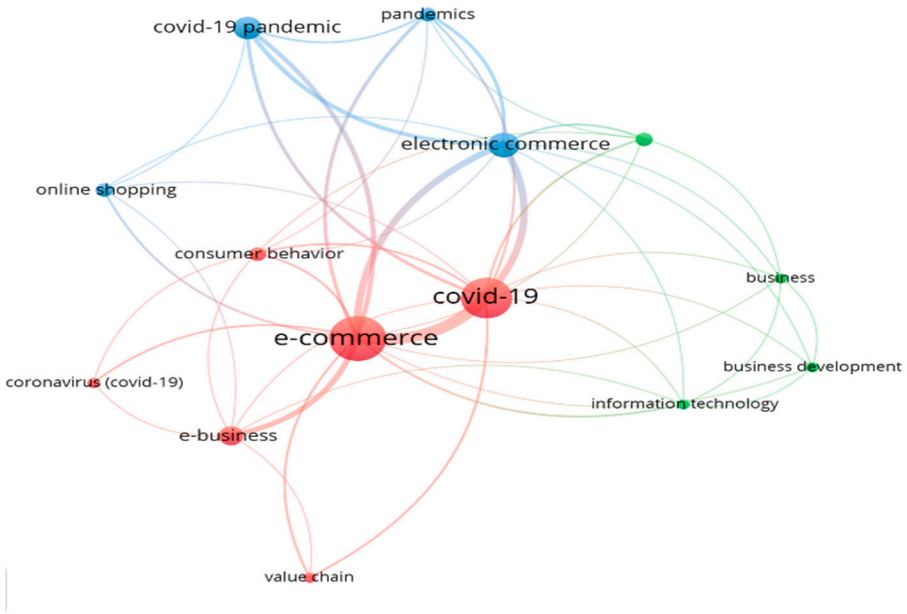


**Figure 7.** Visualization of bibliometric analysis network.

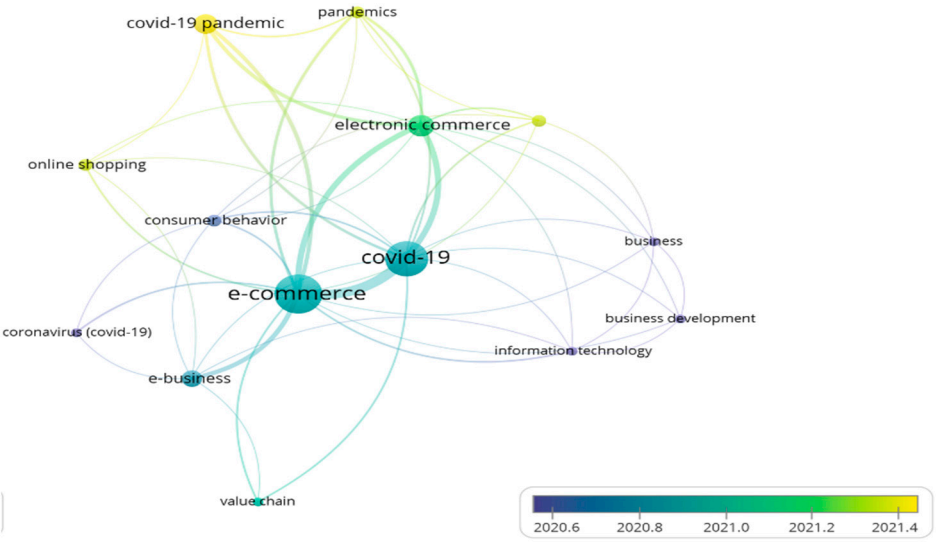


**Figure 8.** Visualization by year of bibliometric analysis.

Figure 8 shows a bibliometric analysis where the year of publication of each selected article was taken into consideration, highlighting that the main clusters "COVID-19" and "e-commerce" were mostly from 2021 articles.

Along the same lines, Figure 9 shows, as a heat map, the important terms of the analyzed articles, where the keywords "e-commerce" and "COVID-19" stand out, affirming their relation with the present research through their frequency among the selected articles.

After carrying out the bibliometric analysis, 14 items were obtained, which were grouped into three clusters as a result of the bibliometric analysis, as shown in Table 3.

The bibliometric analysis was continued by using Bibliometrix software. Figure 10 shows the word cloud generated from the search of articles, where it can be seen that the most relevant words in these articles are "COVID-19", "e-commerce", "consumption behavior", "retailing", etc.

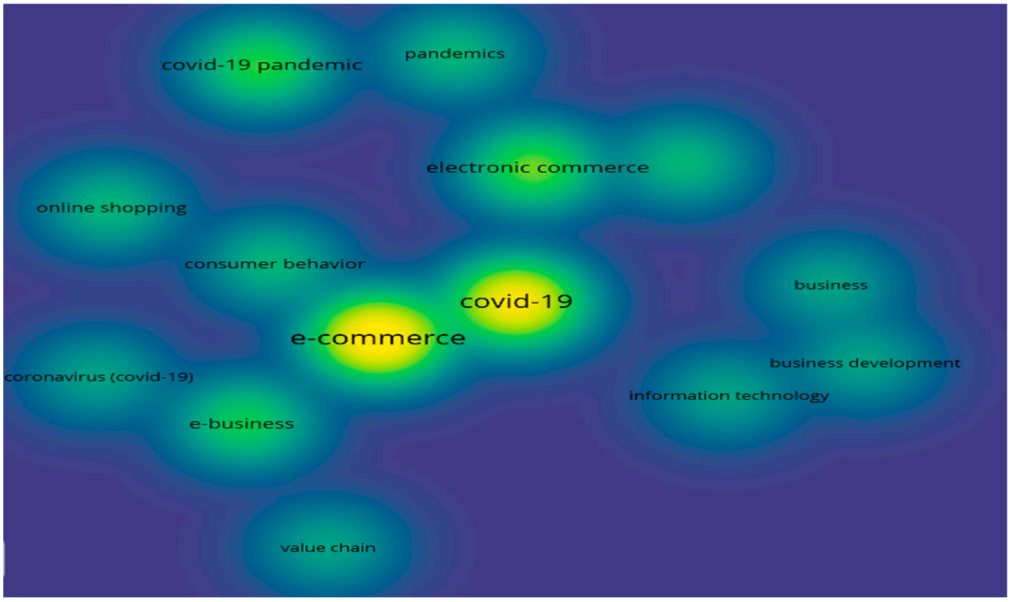


**Figure 9.** Visualization of bibliometric analysis density.

**Table 3.** Results of bibliometric analysis.

| | Items | Links | Total Bond Intensity | Occurrence | Color |
|---|---|---|---|---|---|
| Cluster 1 | consumer behavior | 7 | 9 | 3 | Red |
| | coronavirus (COVID-19) | 3 | 4 | 2 | |
| | COVID-19 | 12 | 33 | 15 | |
| | e-business | 7 | 11 | 5 | |
| | e-commerce | 13 | 42 | 18 | |
| | value chain | 3 | 5 | 2 | |
| Cluster 2 | business | 6 | 6 | 2 | Green |
| | business development | 5 | 5 | 2 | |
| | information technology | 6 | 7 | 2 | |
| | pandemic | 6 | 8 | 3 | |
| Cluster 3 | COVID-19 pandemic | 5 | 14 | 6 | Blue |
| | electronic commerce | 10 | 26 | 7 | |
| | online shopping | 5 | 6 | 3 | |
| | pandemic | 6 | 12 | 3 | |


**Figure 10.** Word cloud.

Figure 11 shows a tree map with the keywords of the articles from the databases, where the word "electronic commerce" is the one with the highest percentage at 17%,

followed by "COVID-19" at 15%, the one with the highest level of concurrence among the analyzed articles.

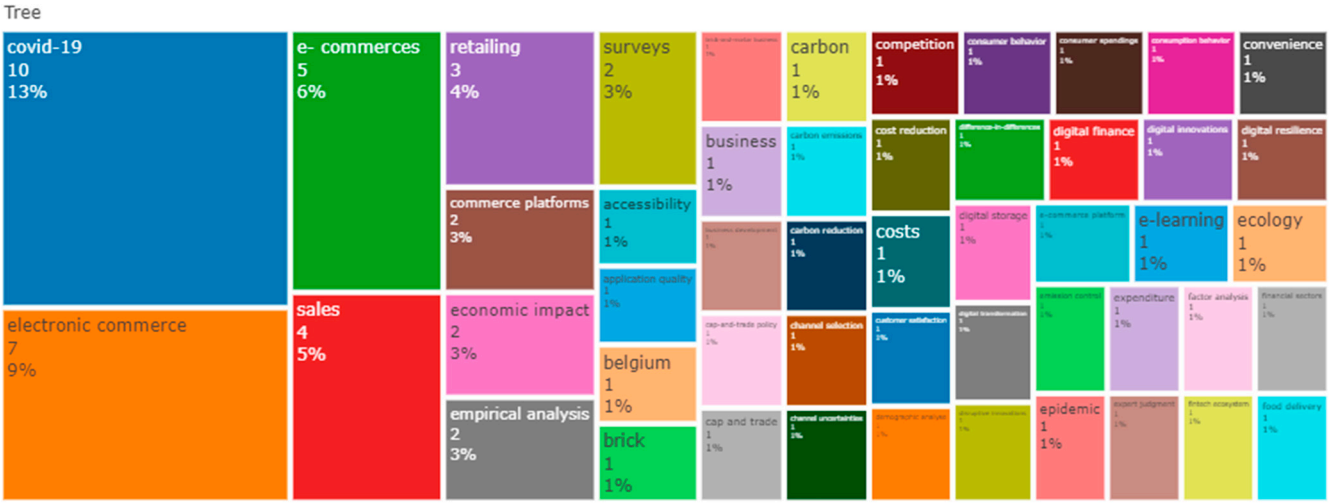


**Figure 11.** Tree Map.

Of the articles selected for the research, six economic sectors were identified, the distribution of which can be seen in Table 4.

**Table 4.** Items by economic sector.

| Economic Sector | Articles |
|---|---|
| General trade | (Scutariu et al. 2021), (Syamruddin et al. 2021), (Yakean 2020), (Alkhunaizan and Ali 2022), (Meow Yee et al. 2022), (Naab and Bans-Akutey 2021), (Aishel et al. 2021), (Alam and Rahman 2021), (Agus et al. 2021), (Sardjono et al. 2021), (Dayal et al. 2021), (Lechuga Nevárez and Hernández Chavarria 2021), (Tran 2021), (Rattanawicha et al. 2021), (Awotunde et al. 2022), (Waqas Ashraf et al. 2020), (Paraschiv et al. 2022), (Odeh and Yousef 2021), (Khan et al. 2021), (Zhang 2022), (Kitukutha et al. 2021), (Pantelimon et al. 2020), (Kawasaki et al. 2021), (Huo et al. 2021) |
| Retail | (AL-Ali et al. 2022), (Han et al. 2020), (Beckers et al. 2021), (Ghandour and Woodford 2020), (Hossain et al. 2022), (Palomino Pita et al. 2020), (Jasińska-Biliczak 2022), (Sharma 2020), (Mansour and Abdullah 2020), (Hasanat et al. 2020), (Szász et al. 2022), (Albliwi and Alsolami 2021) |
| Fashion retail | (Bilinska-Reformat and Dewalska-Opitek 2021) |
| Health/pharmaceutical | (Guthrie et al. 2021) |
| Logistics | (Juliet Orji et al. 2022) |
| Agriculture/food | (Guo et al. 2021), (Gao et al. 2020) |

Figure 12 shows the distribution of the articles selected for the research according to the database from which they were obtained and the economic sector identified, using dynamic tables.

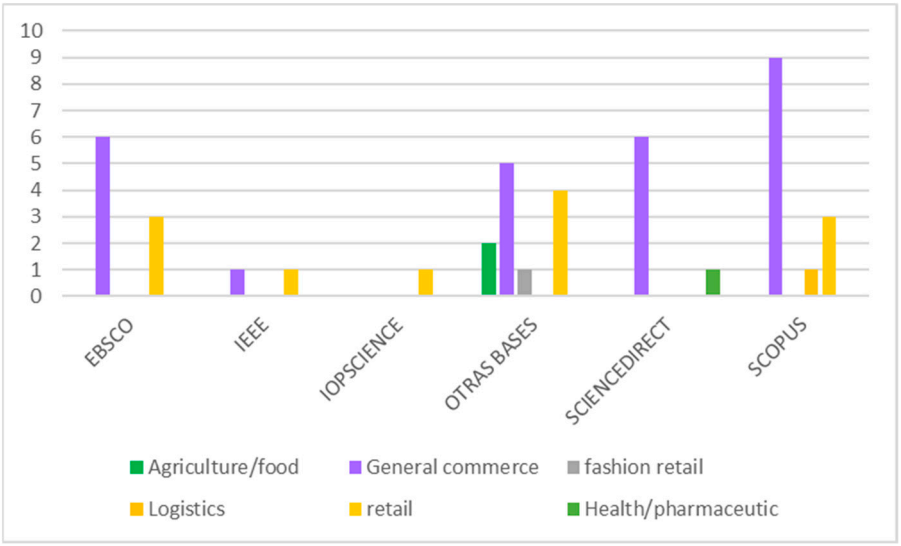


**Figure 12.** Selected items according to economic sector and database.

Table 5 shows the distribution of tools adopted and/or studied in the selected articles.

**Table 5.** Articles according to the tools adopted or studied.

| Tools | Articles |
|---|---|
| E-commerce, f-commerce y/o m-commerce | (Scutariu et al. 2021), (Syamruddin et al. 2021), (Alkhunaizan and Ali 2022), (AL-Ali et al. 2022), (Han et al. 2020), (Beckers et al. 2021), (Ghandour and Woodford 2020), (Alam and Rahman 2021), (Aishel et al. 2021), (Hossain et al. 2022), (Dumanska et al. 2021), (Palomino Pita et al. 2020), (Bilinska-Reformat and Dewalska-Opitek 2021), (Jasińska-Biliczak 2022), (Agus et al. 2021), (Sharma 2020), (Sardjono et al. 2021), (Lechuga Nevárez and Hernández Chavarria 2021), (Tran 2021), (Guthrie et al. 2021), (Rattanawicha et al. 2021), (Paraschiv et al. 2022), (Mansour and Abdullah 2020), (Khan et al. 2021), (Waqas Ashraf et al. 2020), (Zhang 2022), (Kitukutha et al. 2021), (Szász et al. 2022), (Pantelimon et al. 2020), (Juliet Orji et al. 2022), (Guo et al. 2021), (Kawasaki et al. 2021), (WiScicka-Fernando 2021), (Gao et al. 2020) |
| E-payment | (Yakean 2020), (Alkhunaizan and Ali 2022), (AL-Ali et al. 2022), (Odeh and Yousef 2021) |
| E-business | (Meow Yee et al. 2022), (Naab and Bans-Akutey 2021), (Huo et al. 2021), (Dayal et al. 2021), (Awotunde et al. 2022), (Masoud et al. 2021), (Hasanat et al. 2020) |
| E-logistics, no contact delivery | (Meow Yee et al. 2022), (AL-Ali et al. 2022) |

Figure 13 shows the distribution of the articles selected for the research according to the database from which they were obtained and the tools used and/or studied in these articles.

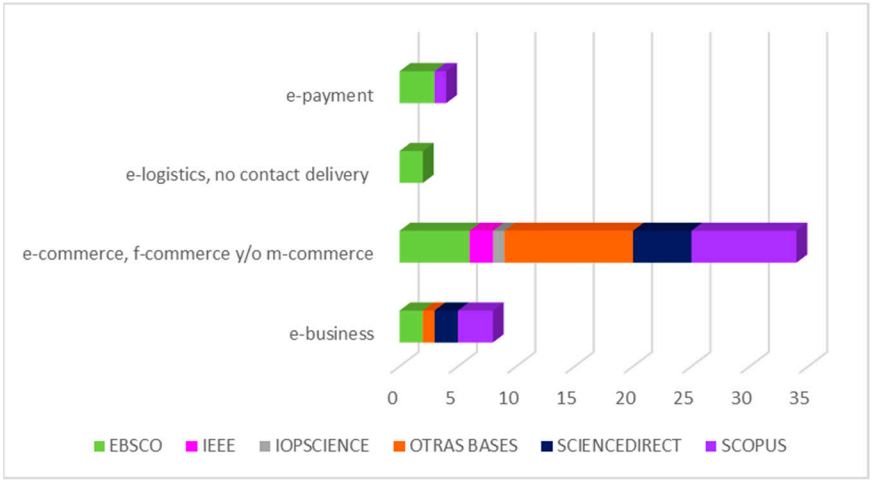


**Figure 13.** Articles selected according to the tools used and/or studied, by database.

Likewise, each article had a different study subject, as shown in Table 6; that is, some focused on companies, others on businesses, and others on platform users.

**Table 6.** Articles by the subject of study.

| Subject of Study | Articles |
| --- | --- |
| Workers and/or companies with an e-business | (Scutariu et al. 2021), (AL-Ali et al. 2022), (Han et al. 2020), (Sharma 2020), (Albliwi and Alsolami 2021), (Ghandour and Woodford 2020), (Meow Yee et al. 2022), (Hossain et al. 2022), (Waqas Ashraf et al. 2020), (Guthrie et al. 2021), (Szász et al. 2022), (Mansour and Abdullah 2020), (Guo et al. 2021), (Sardjono et al. 2021), (Bilinska-Reformat and Dewalska-Opitek 2021), (Dumanska et al. 2021) |
| Workers and/or various companies and/or businesses | (Syamruddin et al. 2021), (Lechuga Nevárez and Hernández Chavarria 2021), (Khan et al. 2021), (Yakean 2020), (Dayal et al. 2021), (Hasanat et al. 2020), (Alkhunaizan and Ali 2022), (Paraschiv et al. 2022), (Juliet Orji et al. 2022), (Huo et al. 2021), (Awotunde et al. 2022), |
| Workers and/or small and/or medium-size companies | (Naab and Bans-Akutey 2021), (Beckers et al. 2021), (Aishel et al. 2021) |
| Users, experts, and professionals | (Kawasaki et al. 2021), (Gao et al. 2020), (Rattanawicha et al. 2021), (Masoud et al. 2021), (Alam and Rahman 2021), (Palomino Pita et al. 2020), (Jasińska-Biliczak 2022), (Agus et al. 2021), (Odeh and Yousef 2021), (Kitukutha et al. 2021) (Pantelimon et al. 2020), (Tran 2021), (WiScicka-Fernando 2021) |

Figure 14 shows the distribution of the articles selected for the research according to the database from which they were obtained and the subjects of the study.

From the review conducted, the following measures and/or changes were identified with respect to e-business tools and their derivatives following the impact of the COVID-19 pandemic, as shown in Table 7.

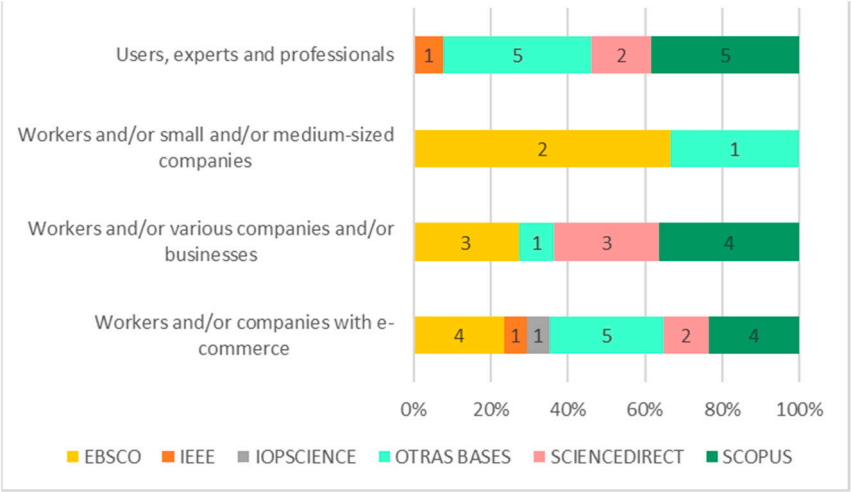


**Figure 14.** Selected articles according to study subject and database.

**Table 7.** Articles by measures and/or changes implemented after the pandemic.

| Measures and/or Changes | Articles |
|---|---|
| Changes in the business model to adopt technological tools. | (Scutariu et al. 2021), (Hossain et al. 2022), (Bilinska-Reformat and Dewalska-Opitek 2021), (Dumanska et al. 2021), (Awotunde et al. 2022) |
| Transition from conventional in-store model to online platforms: e-commerce, m-commerce, or e-business | (Scutariu et al. 2021), (Sharma 2020), (Gao et al. 2020), (Albliwi and Alsolami 2021), (Ghandour and Woodford 2020), (Naab and Bans-Akutey 2021), (Rattanawicha et al. 2021), (Beckers et al. 2021), (Alkhunaizan and Ali 2022), (Paraschiv et al. 2022), (Zhang 2022), (Aishel et al. 2021), (Sardjono et al. 2021), (Bilinska-Reformat and Dewalska-Opitek 2021), (Juliet Orji et al. 2022), (Dumanska et al. 2021) |
| Adoption of cloud-computing services | (Scutariu et al. 2021) |
| Adoption of online commercial transactions: business to business (B2B), business to consumer (B2C), consumer to business (C2B), consumer to consumer (C2C), business to administration (B2A), online to offline (O2O), and consumer to public administration (C2A) | (Syamruddin et al. 2021), (Naab and Bans-Akutey 2021), (Alkhunaizan and Ali 2022) |
| E-payment adoption | (AL-Ali et al. 2022), (Yakean 2020), (Alkhunaizan and Ali 2022) |
| Use of social media as a means of sales or e-marketing | (Syamruddin et al. 2021), (Naab and Bans-Akutey 2021), (Rattanawicha et al. 2021), (Beckers et al. 2021) |
| Training in tools focused on information technology | (Naab and Bans-Akutey 2021) |
| Adoption of tools in distribution: use of contactless delivery, e-logistic, e-delivery, and supply chain routing | (Meow Yee et al. 2022), (Naab and Bans-Akutey 2021), (Huo et al. 2021) |
| Adoption of tools e-business: business intelligence and customer relationship management (CRM)<br>Supply chain management (SCM) and enterprise resource management (ERM) | (Dayal et al. 2021), (Awotunde et al. 2022) |
| Value chain change in value cycle | (Masoud et al. 2021) |

Table 8 shows the results obtained from the review of the main impacts that the pandemic has had on the growth in the adoption of these e-business tools and on the businesses, companies, and/or users that had already adopted these tools prior to the start of the pandemic.

**Table 8.** Articles on the impact of the pandemic on the e-business sector.

| Impact Caused | Articles |
| --- | --- |
| Increased sales on e-commerce platforms | (Scutariu et al. 2021), (AL-Ali et al. 2022), (Sharma 2020), (Lechuga Nevárez and Hernández Chavarria 2021), (Hossain et al. 2022), (Beckers et al. 2021), (Guthrie et al. 2021), (Szász et al. 2022), (Alkhunaizan and Ali 2022), (Jasińska-Biliczak 2022), (Paraschiv et al. 2022), (Kitukutha et al. 2021), (Guo et al. 2021), (Pantelimon et al. 2020), (Sardjono et al. 2021), (Dumanska et al. 2021), (Awotunde et al. 2022), (Tran 2021), (WiScicka-Fernando 2021) |
| Increased adoption of e-commerce, m-commerce, or e-business | (Scutariu et al. 2021), (Han et al. 2020), (Sharma 2020), (Lechuga Nevárez and Hernández Chavarria 2021), (Albliwi and Alsolami 2021), (Ghandour and Woodford 2020), (Khan et al. 2021), (Rattanawicha et al. 2021), (Beckers et al. 2021), (Alkhunaizan and Ali 2022), (Paraschiv et al. 2022), (Zhang 2022), (Kitukutha et al. 2021), (Aishel et al. 2021), (Sardjono et al. 2021), (Juliet Orji et al. 2022), (Dumanska et al. 2021), (Awotunde et al. 2022) |
| Increase of users in the use of e-commerce or f-commerce | (Syamruddin et al. 2021), (AL-Ali et al. 2022), (Lechuga Nevárez and Hernández Chavarria 2021), (Kawasaki et al. 2021), (Khan et al. 2021), (Hossain et al. 2022), (Beckers et al. 2021), (Guthrie et al. 2021), (Alam and Rahman 2021), (Palomino Pita et al. 2020), (Jasińska-Biliczak 2022), (Sardjono et al. 2021), (Dumanska et al. 2021), (Tran 2021) |
| Increase in e-business startups | (Syamruddin et al. 2021) |
| Increased adoption of e-payment (online payments) | (Lechuga Nevárez and Hernández Chavarria 2021), (Yakean 2020), (Alkhunaizan and Ali 2022), (Odeh and Yousef 2021) |
| Reduction of sales for companies or businesses using e-commerce or e-business | (Han et al. 2020), (Waqas Ashraf et al. 2020), (Hasanat et al. 2020), (Alam and Rahman 2021), (Kitukutha et al. 2021), (Bilinska-Reformat and Dewalska-Opitek 2021) |
| Increased improvement and performance of the company and workers through the adoption of e-business tools | (Dayal et al. 2021), (Juliet Orji et al. 2022), (Awotunde et al. 2022) |
| Fluctuation in the value of e-commerce company shares | (Mansour and Abdullah 2020) |

On the other hand, the shift from the traditional way to the adoption of e-business tools, due to the pandemic, revealed several problems, which are shown in Table 9.

**Table 9.** Articles according to problems detected with the adoption of e-business tools.

| Problems Detected | Articles |
| --- | --- |
| Uneven technology diffusion | (Scutariu et al. 2021), (Lechuga Nevárez and Hernández Chavarria 2021) |
| Growth of cybercriminals (hacker victims) | (Yakean 2020), (Meow Yee et al. 2022), (Dumanska et al. 2021) |
| Lack of knowledge of technology on the part of personnel | (Lechuga Nevárez and Hernández Chavarria 2021), (Gao et al. 2020), (Yakean 2020), (Awotunde et al. 2022) |
| Technical and/or financial problems in the transition to virtual business | (Albliwi and Alsolami 2021), (Naab and Bans-Akutey 2021) |
| Total confinement | (Han et al. 2020), (Guthrie et al. 2021) |
| Maintaining online channels (e-commerce) | (Hossain et al. 2022), (Beckers et al. 2021) |
| Lack of and/or limitations in policies, support, and/or interest from the government in implementing technological tools | (Sharma 2020), (Gao et al. 2020), (Ghandour and Woodford 2020), (Yakean 2020), (Meow Yee et al. 2022), (Masoud et al. 2021), (Alkhunaizan and Ali 2022), (Alam and Rahman 2021), (Kitukutha et al. 2021), (Guo et al. 2021) |
| Sales fraud | (Alam and Rahman 2021) |
| Limitations in operations and delays in the distribution of products | (Ghandour and Woodford 2020), (Guthrie et al. 2021), (Paraschiv et al. 2022), (Zhang 2022) |
| High delivery costs | (Dumanska et al. 2021) |
| Limitations from territorial constraints (supply chain problems and remote locations) | (Gao et al. 2020), (Hossain et al. 2022), (Waqas Ashraf et al. 2020), (Hasanat et al. 2020), (Agus et al. 2021), (Kitukutha et al. 2021), (Guo et al. 2021) |

Many new tools needed to be used because of the pandemic, and Table 10 shows the perceptions of using these various e-business tools, which we obtained after reviewing the selected articles.

**Table 10.** Articles according to perception in the use of e-business tools.

| Perception | Articles |
| --- | --- |
| Technology acceptance | (Scutariu et al. 2021), (Ghandour and Woodford 2020) |
| Prevention of COVID-19 infection | (Kawasaki et al. 2021), (Yakean 2020), (Alkhunaizan and Ali 2022), (Palomino Pita et al. 2020), (WiScicka-Fernando 2021) |
| Increased confidence in e-commerce and recognition of its importance | (AL-Ali et al. 2022), (Kawasaki et al. 2021), (Alkhunaizan and Ali 2022), (Tran 2021) |
| Allowing companies to continue to operate | (Ghandour and Woodford 2020), (Alkhunaizan and Ali 2022), (Paraschiv et al. 2022) |
| Saving time and money and offering convenience and efficiency | (Meow Yee et al. 2022), (Rattanawicha et al. 2021), (Alkhunaizan and Ali 2022), (Palomino Pita et al. 2020), (Kitukutha et al. 2021) |
| Better security | (Lechuga Nevárez and Hernández Chavarria 2021), (Alkhunaizan and Ali 2022). (Jasińska-Biliczak 2022), (Tran 2021) |
| No significant changes were presented regarding the impact of the pandemic on e-commerce platforms | (Agus et al. 2021), (Zhang 2022) |
| Lack of trust because it is not considered safe (relationship between food and contagion) | (Gao et al. 2020), (Waqas Ashraf et al. 2020), (Hasanat et al. 2020) |
| Confidence in the use of electronic payment | (Odeh and Yousef 2021) |

## 4. Discussion

After having carried out the selection and review of various scientific articles whose respective objectives were to analyze the impact of the COVID-19 pandemic on the use, growth, and development of e-business by companies, industries, and individuals in general, it is possible to provide answers to the research questions posed in this study.

RQ1. What actions or changes regarding the implementation and/or use of e-business were taken in the aftermath of the pandemic?

According to a review of the articles, the measures and/or changes adopted after the pandemic regarding the use and/or implementation of e-business have been as follows: in the first instance, a transition from a traditional business model, such as face-to-face sales of various products or managing the main processes of companies, to online platforms, better known as e-commerce, m-commerce, and e-business, and second, the application of commercial transactions unchained from the adoption of the aforementioned tools, such as business to business (B2B), consumer to business (C2B), customer relationship management (CRM), and supply chain management (SCM), among others, because the restrictions related to social distancing and the closing of the business caused them to become the most optimal tools for the continuation of the sales chain. Logistics and payment changes were reflected in the acceptance of e-logistics, e-delivery, and e-payment for the continuation of the delivery of products and payment in a digitized way. However, e-marketing became the best option in the continuation of the promotion of products or services of companies, businesses, and people in general. These changes and measures can be seen in Table 7.

These changes and measures identified are mostly related to e-commerce, one of the components of e-business, as shown in Table 5 and Figure 13, which shows the study tools in the scientific articles selected for this research.

RQ2. What impact did the pandemic have on the growth of e-business tool adoption and on establishments or companies that had already adopted e-business tools prior to the pandemic?

Regarding the impact of the pandemic on the growth of adopting e-business tools and of establishments or companies that had already implemented them prior to the beginning of the pandemic, according to the results obtained in a review of the articles, it can be seen that most of them triggered an increase in sales as a result of the increase in the use of e-commerce, m-commerce, and e-business, which in turn originated from the increase in users who began to use them as a side effect of the lockdown due to the pandemic.

Additionally, the increase in sales varied depending on the industry, as can be seen in the following figure, where the supermarket and telecommunications industries were the most predominant, as opposed to tourism, as can be seen in the economic sectors identified in the articles reviewed, where the vast majority of studies were related to commerce in general, as shown in Table 4.

The opposite case was reflected in some studies, which affirmed that the pandemic led to a reduction in sales, one of the causes being the lockdown and territorial limitations that made it impossible to obtain and distribute products, because in some cases, for example, in countries such as Malaysia (Hasanat et al. 2020) and Pakistan (Waqas Ashraf et al. 2020), these depend on China to supply products for the country's e-commerce businesses. On the other hand, in some studies, it was identified that the use of these e-business tools resulted in an increase in the improvement and performance of the companies and workers where they were implemented, but in turn, in other studies, it was identified that the lack and limitations of policies, support and interest from governments made the maintenance of these platforms tedious because of a lack of funding and technical knowledge and because of unequal access to technology, as can be seen in Tables 8 and 9.

RQ3. How did the pandemic influence the perception of e-business usage?

The pandemic influenced the perception of using e-business tools by reinforcing confidence in the use of e-commerce platforms, because of the security that they provide in terms of transactions and personal damages. On the other hand, there were studies that showed that there were no significant changes from the pandemic on the perception

of e-commerce platforms but instead showed a lack of confidence in the platforms that offer food products online because of a fear of the unhygienic handling of these products (Gao et al. 2020) and because they were not considered to be of good quality (Waqas Ashraf et al. 2020). Another important perception identified is how these tools allow companies to continue to operate within a context where business resilience was put to the test.

These perceptions were obtained through the research conducted on the various subjects of the study, most of them being e-commerce workers and e-commerce companies, as well as users, experts, and professionals in the e-business sector, as shown in Table 6.

## 5. Proposed Model

After carrying out a review of the articles selected for this research, as shown in Figure 13, a model based on the analysis of the impact of the pandemic on the growth, use, and development of e-business is proposed, starting from the beginning, with the collection of scientific articles in the various databases chosen for the search, and then applying the inclusion and exclusion criteria, a process that can be seen in Figures 1 and 2. Table 2, whose model can be seen in Figure 15, is based on the main characteristics identified after the analysis, which are measures and/or changes adopted. With the systematization of the literature it was possible to identify the measures and/or changes adopted by the subjects of study in the different articles, as shown in Tables 7 and 9 and in Figure 11, where the most adopted measure was the change from a traditional model, such as physical sales, to an online model, such as e-commerce, m-commerce, or f-commerce—components derived from e-business. Another measure was the use of e-marketing or social networks, which, as mentioned above, do not require physical space or contact to attract customers, as channels to promote products or services and thus increase sales.

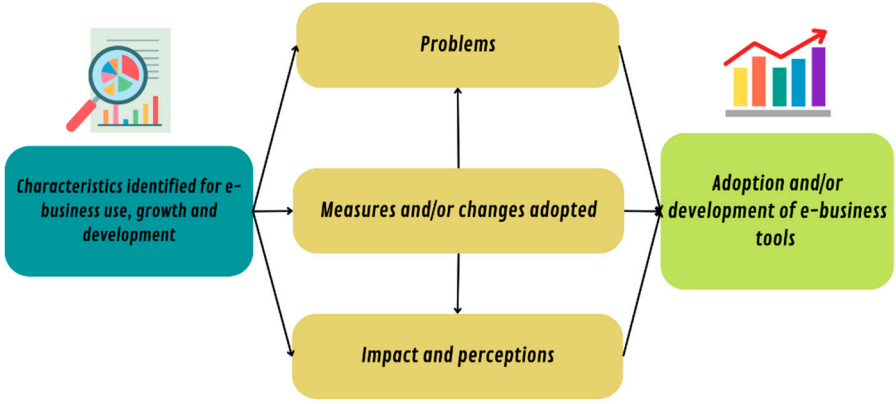


**Figure 15.** Proposed model.

One important feature in the analysis of the impact of the pandemic in e-business is to know what perceptions this generated, the vast majority of which were very positive, where clearly the increase in sales was the most frequent result according to the subjects of study of the articles, which in turn triggered the growth of users, making it possible to establish a relationship between the pandemic, the increase in people using online platforms, and the increase in sales. This connection affirms that after a pandemic, digital tools such as e-business always offer great benefits in the sectors in which they are applied because the use of the Internet does not require direct physical contact between customers and companies. They are also beneficial in organizational environments, where the tools are applied to improve the performance of workers, as can be seen in Tables 8 and 10.

Another characteristic identified in the analysis of the impact of the pandemic on the growth, use, and development of e-business, is that of the problems triggered by their adoption during the pandemic, as shown in Table 9. The main problem identified is the lack of and/or limitations on policies, support, and interest from governments on the development of digitalization strategies for traditional sales-related models because

businesses needed funding to transition to an accelerated digital transformation that many had not planned for or did not consider would happen very quickly. Another case is that of territorial limitations, in that many countries depend on other countries to be able to sell various products or services, showing that any threat that affects territorial limitations will always have an impact on the economic sector, no matter how many technological tools are applied to counteract the impact.

The growth, use, and development of e-business through the systematic review of the literature allowed us to identify three important characteristics that should be taken into account in the continued adoption of e-business, such as the changes and measures that are adopted, given that technology is always advancing and every day new discoveries and trends emerge that seek to attract more customers and improve the processes of companies or businesses. In addition to this, the impact and the perception that the use of these brings must be analyzed to determine which strategy is best for each case, because even if the same strategies are applied, the expected results will not always be the same; after all, the environment and the internal factors in which they are developed will differ depending on the country, city, culture, etc. Finally, the problems that arise or are triggered must be taken into account so that measures can be taken to solve them and promote the continued growth, use, and development of e-businesses.

## 6. Related Articles

Other systematic literature review studies were found, such as the one by Nur Ani in Indonesia (Ani 2020), related to e-payment, whose study objective was to examine the social impact and role of the e-payment provider and the relationship between the government and the use of e-payment transactions in the midst of the outbreak of the COVID-19 pandemic. It made use of the PRISMA methodology in order to obtain answers to the research questions, where reference was made to 12 articles obtained from databases and search engines, such as Scopus, ScienceDirect, IEEE and Google Scholar, identifying factors such as the impact on the consumer, the impact on the business subject, and the role of the government and e-payment service providers and concluding in the proposal of a model based on the use of e-payment transactions, cooperation with banks and e-payment service providers, the promotion of access to the use of e-payment, and the facilitation of consumer transactions through social programs to support them.

On the other hand, the following systematic literature review article, by Cheong et al. (2020), focused on e-commerce, aiming to provide an overview of the latest research on the adoption of e-commerce in small and medium-size enterprises, with a focus on Malaysia. The article's methodology consisted of a review of peer-reviewed and publicly accessible literature in databases such as ScienceDirect, Emerald, SpringerLink, Scopus, and Google Scholar, covering both online and offline literature. It concluded that companies, together with governments, must work to restart the processes and continue the implementation of financial actions through studied, conclusive, and real procedures and to restart the development and implementation of a digital tax because more and more companies were making the transition to online models with the aim of reducing the spread of COVID-19.

Lastly, the following systematic review article, by Ünvan and Pampal (2022), is based on the development of e-business, with the objective of reviewing the literature related to the existence of e-business management to make a critical evaluation of the studies in recent years, from which, after performing the search and applying the selected filters, 32 articles were obtained for review. The study was able to determine the importance of e-business tools for the management of companies and how the pandemic brought with it companies' inevitable adoption of these tools because they are necessary for companies' survival by allowing companies to attract more customers, communicate with business partners, and achieve market opportunities. The study also showed how the COVID-19 pandemic increased the use of e-business tools and became a fashionable topic for researchers contributing to the literature of e-business and COVID-19.

## 7. Conclusions

After conducting the present study through a systematic literature review oriented to an analysis on the impact of the pandemic on the growth, use, and implementation of e-business, we can reach the following conclusions.

The pandemic changed the traditional processes related to the management of businesses and companies, as well as sales, payments, and distribution, which came with the use of e-business tools, where e-commerce was the most practiced method used by entrepreneurs, traders, and people offering their products or services, because this tool, as well as the other components of e-business, did not (and does not) require physical contact between people. By merely having a technological device, one can begin to adopt these tools. In this pandemic context, where noncontact was crucial in the struggle, these tools became the only course to maintain the sales chain.

Likewise, the impact from their use must be taken into account. As mentioned before, they made possible the resumption of sales, in some cases increasing them and in others attracting more customers. However, this situation varied depending on the country of study, in that in places where the restrictions of lockdowns were extreme, the percentage of sales was reduced until they had been lifted. On the other hand, the dependence on imports for the operation of a business was also reflected in its sales figures; another side of the coin was seen in how the use of imports improved the management of the companies that adopted e-business tools and improved the performance of workers.

Further, a model for the continued adoption, use, and implementation of these tools was proposed, where the three important characteristics identified were the measures and changes that occurred in the sector, the impact and perception that they triggered, and the problems that arose after such implementation. Taking these characteristics into account and adapting them according to the needs of the business, company, or person who will use them can better integrate them into the business model and make the most of their benefits.

Some limitations were found by locating unreadable articles and those that did not show the effectiveness of their results. In spite of the limitations, it can be concluded that the research was fruitful because it was possible to fulfill the objective established at the beginning of the research and provide answers to the questions posed. In addition, it is expected that this may be of great support for future research or studies on the continuity of the development of e-business tools and for making comparisons with contexts other than the pandemic, in order to obtain a broader point of view.

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