Exploring Electronic Business (EB) and Digital Transformation (DT) Changes and Future Directions for Research: A Bibliometric Analysis Considering the Intellectual Contributions from Egypt

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ABSTRACT

Business-improved competitiveness and efficiencies are such instances of Electronic Business (EB) added value and benefits. This research aims to review and analyse the EB literature, focusing on models and the digital transformation (DT) evolution. Provide answers on the EB origin, EB models and developments, themes, and forthcoming research trends based on analytical studies;

The EB figures and critical intellectual contributions from Egypt are classified, a bibliometric analysis of EB database sources concerning Egypt. The interdisciplinary, reliable, comprehensive, and reputable database "Scopus". The adopted research method involves surveying previous and recent EB studies. The selected EB literature was diverse, impactful, and informative. The surveying procedures and bibliometric analysis conduction passed through several organised phases, ending with the outcomes and future research themes.

This research contributes to raising scholars' awareness of EB developments, trends, the evolution of DT, and future directions. Furthermore, consider the Egyptian figures, EB intellectual contributions ranks, and bibliometric analysis outcomes.

Keywords: Digital Transformation (DT); Electronic Business (EB); Egypt; Bibliometric Analysis; Scopus database

1. Introduction

The enhancement in technologies has no end. Every day there is something new, serving different users (individuals and businesses) on both micro and macro levels. EB has confirmed advantages for business; however, the attained EB advantages amounts are not similar across businesses. E-business and Digital Transformation (DT) are intertwined operations that impact business functions and strategies remarkably. Leadership, government support, and strategic IT investments can't be ignored in digital transformation challenges navigation and benefits maximization procedures. These ingredients remain central to achieving sustainable growth and competitive advantage when businesses continue to evolve in the digital age.

The former studies in EB have drowned a path for businesses targeting the adoption of EB; such as issues of launching EB strategy and its embedded activities, models, development phases, levels, stages, and types, i.e.(McDonald, 1999; Johnson & Scholes, 1999; Smith, 1999; Lynch, 2000; Hackbarth & Kettinger, 2000; Venkatraman, 2000; Laudon & Carol, 2003; Singh, 2004; Chaffey et al., 2006; Turban et al., 2012). In response, the most recent studies discuss EB issues from other perceptive and angles. The accelerated, frequent technological changes and instability of the business environment create new dimensions that justify more investigations in EB. Among these investigations (Hajli,2019; Barros & Mesquita, 2020; Haryanti & Subriadi, 2020; Khurana, 2020; Nazir & Roomi, 2020; Galli, 2021; Hajli & Shirazi, 2021; United Nations, 2021a).

The following lines express the main layout of this study. The second section covers the research questions and objectives, and then in section three: research methodology that explains the applied research method and presents a description of the process of surveying EB studies. Section four is a literature review that includes titles: EB origin, EB models, EC and EB, the EB development. This section ends with Egyptian ICT selected indicators at a glance as an example for governmental initiatives respecting the ICT sector development, internet usage growth, and e-Government development during the COVID-19. In section five, the findings are presented. The research structure closed by offering the key themes and issues based on the conducted bibliometric analysis in section six: future works.

2. Research Objectives

This research targets the following objectives:

- Understanding the starting point of EB, its relationship with the Digital Transformation (DT), and the main covered activities, functions, and practices.
- Surveying EB theoretical models to determine the main focuses and themes. Additionally, exploring the conducted development and enhancement.
- To consider and wrap up the crucial EB figures and intellectual contributions ranks of Egypt among the Arab countries, and the countries of Africa.
- To conduct and wrap up the EB bibliometric analysis concerning Egypt for the year ranges 2001:2024.
- Conclude the upcoming studies themes and topics considering the recent studies that covered the impact of the COVID-19 pandemic.

3. Research Methodology

In this research, an organised literature review was conducted on existing scientific studies, selecting relevant, informative, impactful, and up-to-date EB literature and information from various research, articles, books, and electronic internet sources and databases. The initial sources were the outcome of a search and sources preparation process. The process began with determining research keywords and terms and the selection criteria, the searching by specific keywords and terms: origin / history of EC/EB, EB types, EB models, and development. The initial search process outcome sources were filtered by the defined selection criteria where the resulted listed source should be recent and/or have a unique contribution, relevance, and information (the 1st source collection-Literature Review section). Later, the second source collection has been obtained from visiting the Egyptian Knowledge Bank-EKB, and choosing the Scopus database to query, and then the intended criteria of the query have been selected to filter the database source information (the 2nd source collection - EB bibliometric analysis section).

In the next step, the query outcome sources data file was prepared in order to be used in the VOSviewer tool to generate EB bibliometric density visualization overlay visualization, and network visualization diagrams. Later, the selected collections from the 1st and the 2nd sources were reviewed and analysed; to end up with the future EB studies themes and trends.

Figure 1 (Research Main Stages) illustrates the main stages that this research consists of. It began with the initiation and setting up, followed by search, filtration, and the assessment, then analysis and summing up (for each collection-two stages); later, an accumulated summing up for 1st and 2nd collections has been conducted.

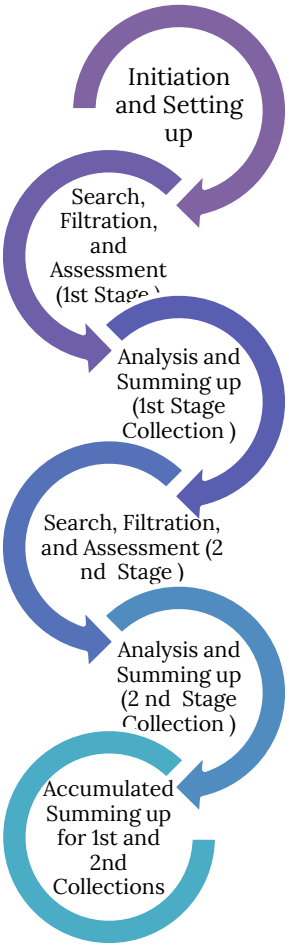

Figure 1: Research Main Stages

Figure 2: (Research Main Stages and their Corresponding Activities, and Steps) below shows the conducted nine activities and steps, and activities within the main stages.

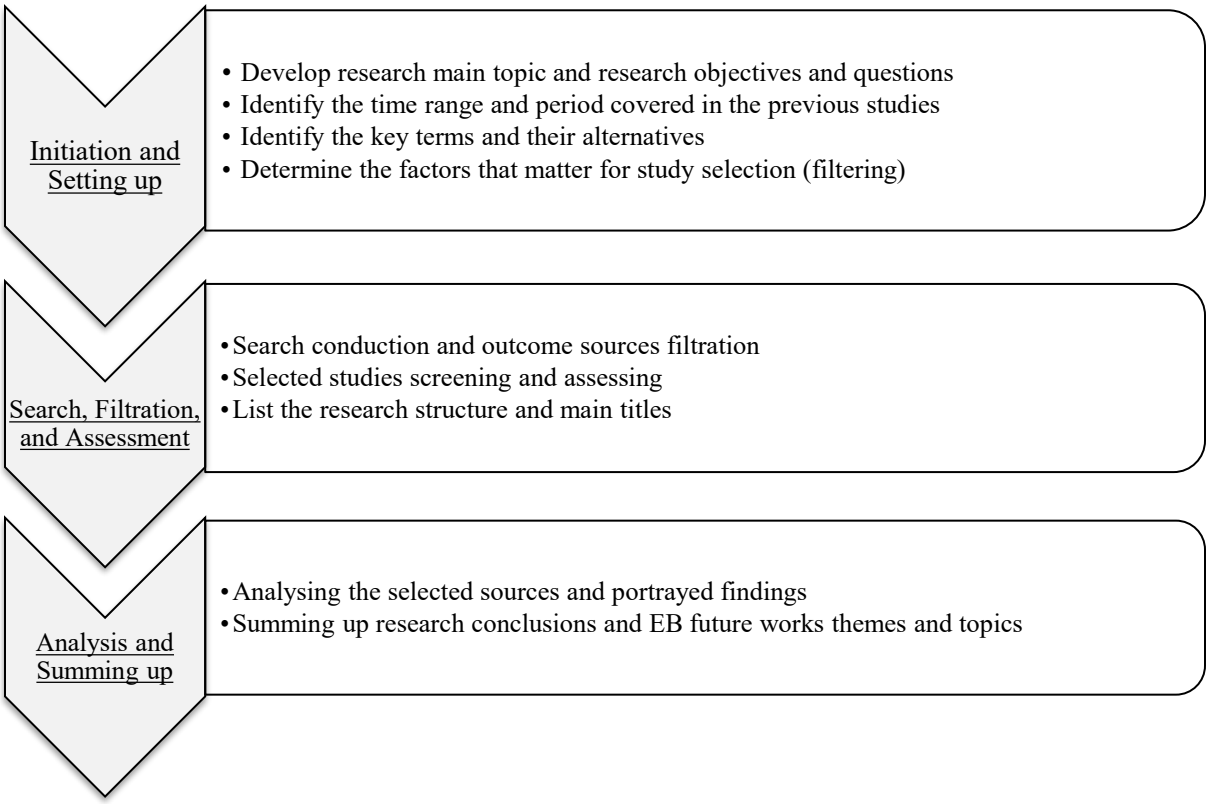

Figure 2: Research Main Stages and their Corresponding Activities, and Steps

4. Related Works - Literature Review

The origin goes back several decades to 1969 by the U.S. government with a tentative use of the Internet. The early users were chiefly the technical audience of government agencies, academic researchers, and scientists. Twenty-one years later- in the early 1990s, the major EC development milestone was detected with the World Wide Web introduction and the beginning of companies' existence on the Internet in text and photos (Turban et al., 2012).

Internet users started to join in, and the term EC was known when the Internet converted commercialized use with a rapid expansion of the .coms or Internet start-ups. Then, the website's development has occurred worldwide for most medium and large organizations (Turban et al., 2012).

During the late 1990s and the early 2000s, EB models were established. Singh (2004) discussed the development of EB models, including business-to-business (B2B), business-to-consumer (B2C), government-to-government, government-to-business, government-to-consumer, and the other developed models. Feng (2006) classified EB into B2B, business to consumers (B2C), consumer to consumers (C2C), consumer to business (C2B), E-government (B2G, C2G, etc.), intra-organisation e-business, and others, etc. Feng (2006) provided instances of business model applications were provided, such as e-shops –web marketing or a shop, e-procurement procurement of goods and services, e-auctions – e-implementation of bidding mechanisms, virtual communities – members with common interests, value-chain service providers – support part of the value chain, (e-logistics, e-payments).

In the early stage of EC, the type of EC based on the nature of transactions and participants' relationships was the B2C form (Turban et al., 2012). They reported that focused EB model(s) have been shifted many times between 1999 and 2009, from B2C into B2B in 1999, from B2B to Business-to- Employees (B2E), Collaborative Commerce (c-commerce), e-government, e-learning, and m-commerce in 2001. The consideration of social networks, m-commerce, and wireless applications was in 2005. Four years later, the addition of social commerce channels (f-commerce) refers to commercial activities on Facebook that were in 2009 (Turban et al., 2012).

Social commerce is considered an EC novel stream; it has a noteworthy part of for business in commercial value creation, stressing the significance of understanding how consumers perceive them in case of setting a commercial potential to social media (Hajli, 2019). In Hajli & Shirazi (2021), a discussion of five papers concerning social commerce and EC technologies associated with issues such as social media influencers, factors impacting shoppers' decisions, shopping online, and models of marketing has been provided. They stressed the significance of understanding the impact of consumers' perceptions of privacy and security factors in developing consumer trust due to its influence on the intended and actual use of social commerce platforms in purchase decisions. In Galli (2021) six categories of EC business models were discussed; he confirmed the criticality of information technology for employing EC models successfully.

Although the EC term started in the early 1990s, EB was used one after the other. EB is the only comprehensive term compared to EC. EB covered any business activities performed online; EC is as EB subset (Khurana, 2020). The early studies differentiate them. EC was portrayed as digitally enabled commercial transactions between and amongst organizations and individuals (Laudon & Carol, 2003). However, EB was mentioned primarily as the digital enablement of transactions and processes within a firm, concerning only the information systems controlled by the firm. EB covered other activities rather than 'buying and selling' via electronic channels (Laudon & Carol, 2003), explained. Another narrow EC definition was provided by Turban et al. (2004); according to their definition, EC is electronic transactions conducted by business partners. Meanwhile, EB is buying and selling, servicing customers, collaborating with business partners, and performing electronic transactions within business.

The creation of EB strategies models was in the late 1990s and the early 2000s. In 1999, Johnson & Scholes provided the "Parallel Corporate Strategy Model"; McDonald developed" the Sequential Marketing Strategy Model", and Smith offered: situation analysis, objectives, strategy, tactics, action and control SOSTAC TM Sequential Marketing Strategy Model. In the same year 2000; Lynch contributed by Sequential Corporate Strategy Model and Hackbarth & Kettinger, (2000) by a multi-stage model to develop an EB strategy "strategic e-breakout" model; it began by initiation- kick-off project, then a diagnosis of the industry environment- assess the current environment, later breakout to establish a strategic target, and finished by transition or plotting a migration path. The "dot-com" strategy was one of the significant offered EB strategies in a five question format, targeting the organisations incorporating an EB component. These questions covered strategic vision – what are you trying to achieve; governance – involving functional and financial decisions; key resource allocation– use outsourcing or internal resources and infrastructure–the ability to add value – personalisation, privacy, and management structures and responsibilities in place (Venkatraman, 2000). A scenario-based analysis was adopted for the alternative models of an organisation's environment future according to Lynch (2000). In 2001, the relationship between the strategy and the Internet was identified by Porter; Internet technology creates unique strategic positioning more attainable than any prior information technology generation for businesses (Porter, 2001).

The benefits of EB innovation on business were confirmed by Singh (2004). Enhancement of competitiveness, efficiencies, market share, and business growth are such instances. The study decided that a business new version is resulted. This new business version was observed in business partners and customers interactions, communicating with new instructions and codes of practice, and in process automation (Singh, 2004). According to Chaffey et al.(2006), a business has six options for its online presence; stage models of the internet marketing capability, where, in level 0, there is no website or web presence, in level 1 the basic web presence is started; in level 2 a simple static informational website, in level 3, the existence of simple interactive site – user can search and make queries to retrieve information; in level 4, an interactive site- supporting interactions with user – offered functions will vary according to company, the last level- level 5- a completely interactive site supporting the whole buying process.

While various theories were tried to clarify what individuals felt and how they behaved toward technology, define user technology acceptance drivers and barriers. Among the conducted research in 2020 was by Haryanti & Subriadi; Haryanti & Subriadi (2020) emphasized that the Unified Theory of Acceptance and Use of Technology (UTAUT), technology acceptance theory, combines variables of different early theories. Haryanti & Subriadi (2020) added that the academics applied the literature review approach to the UTAUT theory adoption in EC in order to conclude the driving factors for EC acceptance in the future due to this theory adoption on the conducted research trends, even though the required inclusion of new influences rather than which included in the theory is based on the findings of different conducted investigations. Haryanti & Subriadi (2020) added.

It is not optional anymore for businesses seeking successful EB adoption to manage the change, including effective management of the EB environment and any amendments related. Transforming a business from its traditional form into an electronic one is a change from its traditional performance, resulting in a large-scale revolution in the current business. Moreover, applying EB successfully needs a dominant and effective management type, although the dissimilar degrees (Singh, 2004).

5. Bibliometric Analysis

Exploring and analysing large volumes of scientific data through quantitative methods that offered insights into the evolutionary nuances and emerging areas within a specific field is a bibliometric analysis (Donthu et al., 2021). It included the adoption of various bibliometric parameters and tools to assess academic productivity: publication count and citation count. In addition to indices such as the h-index and impact factor (Choudhri et al., 2015). The bibliometric analysis is particularly beneficial in organizing knowledge within a scientific field /discipline and recognizing influential studies, authors, and institutions (Merigó & Yang, 2017).

Analysis performance analysis, science mapping, and co-word analysis to assess the state-of-the-art in research areas are among the employed techniques in the bibliometric (Moral-Munoz et al., 2020; Kaparthi, 2012). While tools offering distinctive features for handling bibliometric data; such as VOSviewer, Bibliometrix, and SciMAT, that are ordinarily used (Moral-Munoz et al., 2020; Greener, 2022). These tools facilitate the identification of core research, geographic centers of expertise, and key authors in a domain (Greener, 2022).

Business, medicine, and information science are examples of the application of bibliometric analysis in various fields. It contributes to research output and trends assessment (Ellegaard, 2018; Kokol et al., 2020).

6. EB and DT bibliometric analysis studies

The recent bibliometric analysis studies considering EB and DT reveal a wide-ranging landscape of research trends, influential contributors, and emerging themes. There are various bibliometric tools, such as VOSviewer, HistCite, and CiteSpace, which are used to map out the intellectual structure and evolution of digital transformation research.

Although the significant contributions of Germany, the United States, and the Russian Federation in contributions to digital transformation research are noted the weak collaboration within the field and the emergence of new research areas (Shi et al., 2022).

Digital transformation was considered in another recent research that identifies four main research areas within digital transformation: organizational impacts, applied applications and insights, operational processes, and social aspects, which are further divided into eighteen research streams (Chawla & Goyal, 2021).

In one of 2024 researches in the context of enterprise digital transformation, the USA is distinguished for having the most publications, with Copenhagen Business School being a leading institution. With a focus on digital technology adoption and innovation, the research is classified into the following three stages: budding, system formation, and diversified development. (Chen & Shen, 2024).

Furthermore, for successful implementation, the role of DT in business sustainability and the importance of IT governance frameworks are highlighted as crucial (Moresi et al., 2024). A shift from crisis management during the COVID-19 pandemic to long-term strategic issues such as business model innovation and digitalization strategies was revealed through bibliometric analysis of digital transformation in SMEs (Judijanto et al., 2024). As well as the conduct of studies, it covers digital capabilities in business performance, highlights the progress and key topics in the literature, and recommends future research areas (Taib et al., 2024).

Considering an international environmental risk-COVID-19 pandemic-supporting business to continue and even to grow, although the pandemic impacts were the subject of the new studies. In 2020, a country-based study by Barros & Mesquita (2020) conducted an EB systematic literature review taking into consideration the COVID-19 pandemic in Portugal. The study covered the models of the conception of EB models to generate the pandemic-appropriate one and the implementation of EB for SMEs in Portugal.

Based on Khurana, (2020) keeping the online existence required components, i.e., email marketing, inventory tracking, adoption of a content management system for a business website, and any online applications or tools. Haryanti & Subriadi (2020) recognized that the EC presence is supported/ accepted due to the international growth of EC. However, EC adoption challenges that SMEs faced and their impact on emerging economies were discussed by Nazir & Roomi (2020). Despite the COVID-19 consequences on economies, United

Nations (2021a) reported 2020 as a turning point in the progression of digital and EC sectors during the COVID-19 pandemic; these sectors have boomed and registered newly unrecorded levels. Besides other factors, EC expansion is supported by technology and ICTs revolution, the rapid development of the internet, and government initiatives.

7. Egyptian ICT Figures at a Glance

The following lines present an instance of government initiatives in technologies, internet usage expansion, and e-government development during the COVID-19 (the Egyptian ICT sector progress-selected indicators). According to the Ministry of Communications and Information Technology – MCIT, (2021), in September 2021, the mobile recorded 101.02 Million subscriptions compared to 95.36 million subscriptions in September 2020; with a yearly growth rate of 5.66%. However, the mobile internet subscriptions registered 62.08 million in September 2021, and the USB modem subscriptions reached 3.26 million in the same time; compared to 50.48 million and 3.28 million respectively, for the same two indicators in September 2020. In regards to the Asymmetric Digital Subscriber Line (ADSL) and % mobile internet users to the mobile subscriptions in total, the Ministry of Communications and Information Technology-MCIT, (2021) reported 9.73 million for ADSL and 61.46% for mobile internet users of the mobile subscriptions in total in September 2021, in comparison to 8.45 million, 52.93% with respect to the order in September 2020.

Based on Egypt ICT indicators (n.d.) the proportion of businesses with a web presence was 24% in the year 2011 and reached 42.3% in the year 2019 with a rise of 18.3%, a 76% increase from its value in 2011. The United Nations (2021b) reported the E-Government Development Index (EGDI) and the E-Participation Index for the Arab region showed variances in performances among sixteen Arab countries; however, mainly countries of the Gulf Cooperation Council (GCC) have a good world ranking. Egypt registered a moderate e-Government Development Index (EGDI) in 2020, was 111 of 193 (0.5527), and e-participation was 106 of 193 (0.5119) for the same year (United Nations, 2021c). The highest value of EGDI was 38 in Bahrain and 51 for e-participation; the EGDI reached 170 in Sudan and 175 for e-participation (United Nations, 2021b).

According to the Ministry of Communications and Information Technology-MCIT (2024), mmobile subscription and mobile penetration reached 99.38 million with 94.16% in December 2022 and extended to 106.21 million with 98.89% in December 2023 (6.87 million); the annual change (growth) rate is 4.73%. For the same period (December 2022- December 2023), the active mobile broadband subscriptions (voice and data) reached 69.08 million in December 2022 and extended to 76.68 million in December 2023- with 11.01% growth. The percentage of mobile Internet users reached 69.51% in December 2022 and extended to 72.20% in December 2023-with a 2.69% annual change (growth) rate.Ministry of Communications and Information Technology-MCIT (2024).

Based on the Ministry of Communications and Information Technology - MCIT (2024), the issued capital of newly established ICT companies during December 2022 was 148.89 million EGP in total with the activities of communication, information technology, and IT-enabled services (216 companies); meanwhile, the issued capital of newly established ICT companies recorded 388.29 Million EGP during December 2023 (184 companies) in total. Ministry of Communications and Information Technology - MCIT. (2024).

Egypt Key Country Rank for Intellectual Contributions and Sources Indicators at a Glance

Table 1 below showed the registered rank for Egypt among the countries of Africa in the periods from 1996 to 2022 based on Scimago Journal & Country Rank (2024), Figures 3, 4, and 5 illustrate in 2020, 2021, and 2022 the number of publications, citation count, and H index in subject area that includes E-Business (Business, Management, and Accounting) -all subjects categories, Management Information Systems (MIS), and Management of Technology and Innovation. In the case of all subjects**,** Egypt kept similar positions of rank (3rd) and H index (97), although a rise was marked in the citation counts. Meanwhile, the case of MIS, the rank of Egypt enhanced from the 4th in 2020 and 2021 to the 3rd in 2022 with the same H index of 32. In Management of Technology and Innovation**,** Egypt received the same position as in the MIS category as the rank has been enhanced from the 4th in 2020 and 2021 to the 3rd in 2022 with the same H index of 36 (Scimago Journal & Country Rank, 2024).

Table 1: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting Subject Area and Selected Sub-categories among the Countries of Africa (1996-2022)

Subject Area: Business, Management, and Accounting; All Subject Categories			
Egypt Rank	Publications	Citation Count	H index
3	4562	62220	97
Subject Area: Business, Management, and Accounting; Subject Category: Management Information Systems			
Egypt Rank	Publications	Citation Count	H index
3	422	4158	32
Subject Area: Business, Management, and Accounting; Subject Category: Management of Technology and Innovation			
Egypt Rank	Publications	Citation Count	H index
3	897	10749	36

** Source: Scimago Journal & Country Rank (2024)*

** Metrics based on Scopus® data as of April 2023*

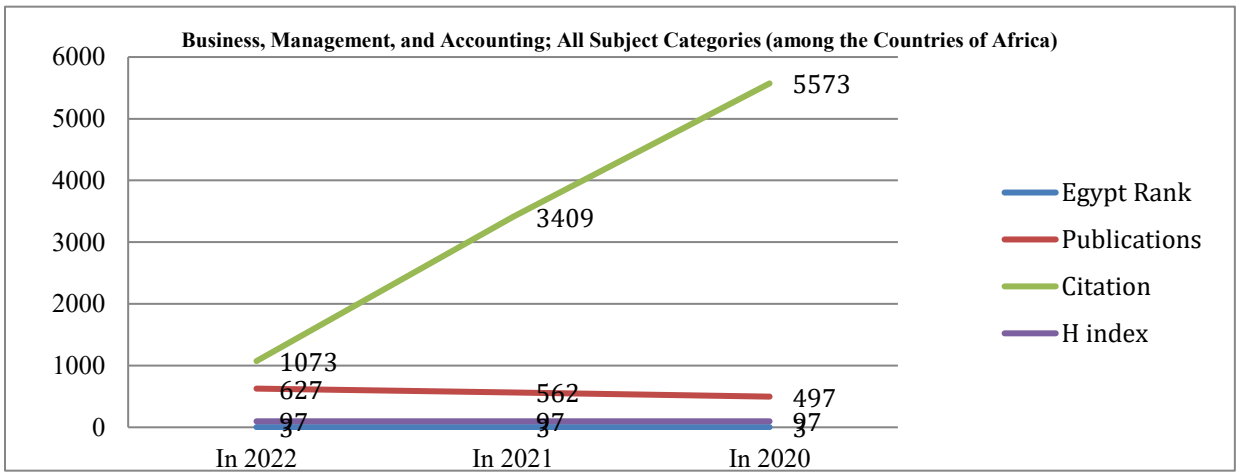

Figure 3: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting; All Subject Categories among the Countries of Africa

**Source: Scimago Journal & Country Rank (2024)*

** Metrics based on Scopus® data as of April 2023*

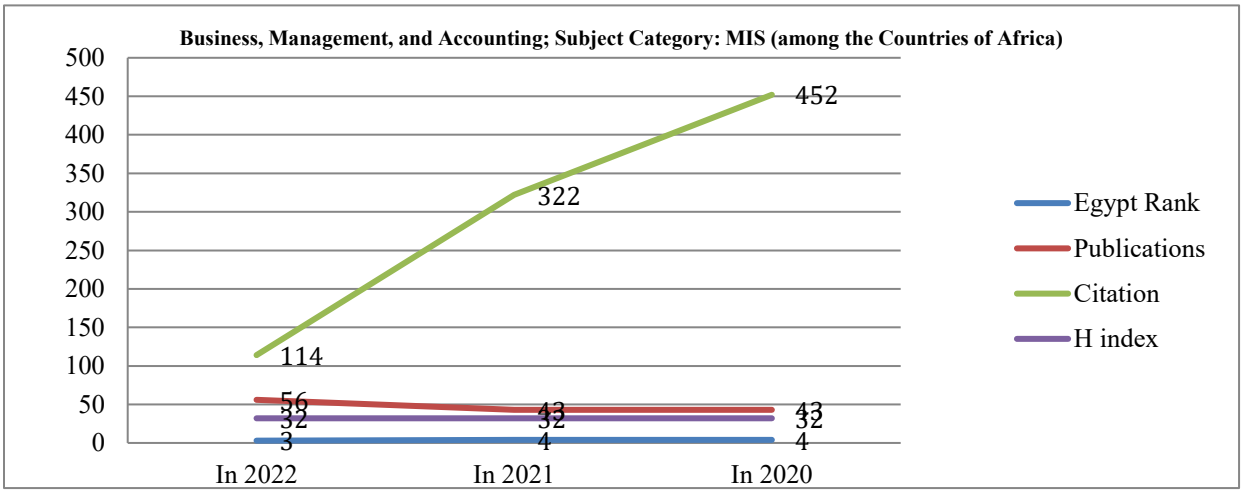

Figure 4: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting; Subject Category: MIS among the Countries of Africa

** Source: Scimago Journal & Country Rank (2024)*

** Metrics based on Scopus® data as of April 2023*

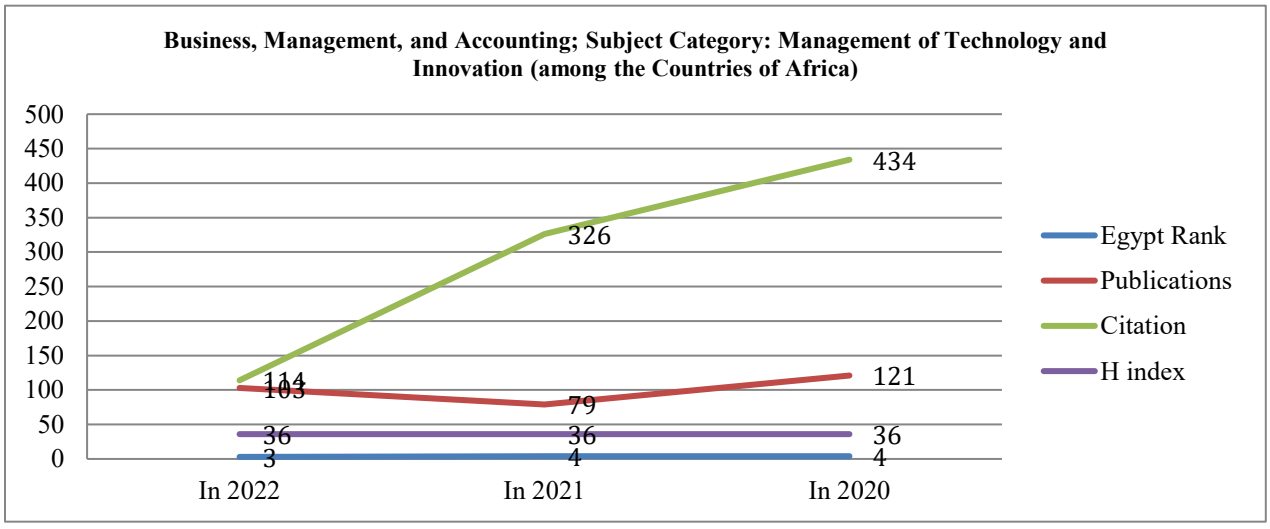

Figure 5: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting; Subject Category: Management of Technology and Innovation among the Countries of Africa

** Source: Scimago Journal & Country Rank (2024)*

** Metrics based on Scopus® data as of April 2023*

Having the same concept, Table 2 below illustrates the recorded rank for Egypt among the Arab countries in the periods from 1996 to 2022 based on Scimago Journal & Country Rank (2024), Figures 6, 7, and 8 demonstrate in 2020, 2021, and 2022, number of publications, citation count, and H index in the subject area that includes E-Business (Business, Management, and Accounting)-all subject categories, MIS, and Management of Technology and Innovation. In the case of all subject categories, Egypt has been retained the similar positions of rank (4th) in 2020, 2021, and 2022 and the (3rd) overall rank in the period from 1996-2022, and H index (97); while, the citation count has been declined. In the case of MIS category, Egypt occupied fluctuating; the (5th) in 2020, the (6th) in 2021, and back to the (5th) in 2020, and Egypt got an H index (32), although lessening the citation count decreased. Meanwhile, in MIS category, the rank of Egypt has been enhanced from 4th in 2020 and 2021 to 3rd in 2022 with the same H index of 32. In the Management of Technology and Innovation, Egypt kept the (3rd) overall rank for the period between 1996 and 2022. A better position has been received than in the MIS category as the rank has been enhanced for two years from the 5th in 2020 to the 4th in 2020 and 2021 years, then back to 5th in 2022 with the same H index of 36 (Scimago Journal & Country Rank, 2024).

Table 2: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting Subject Area and Selected Sub-categories among the Arab Countries (1996-2022)

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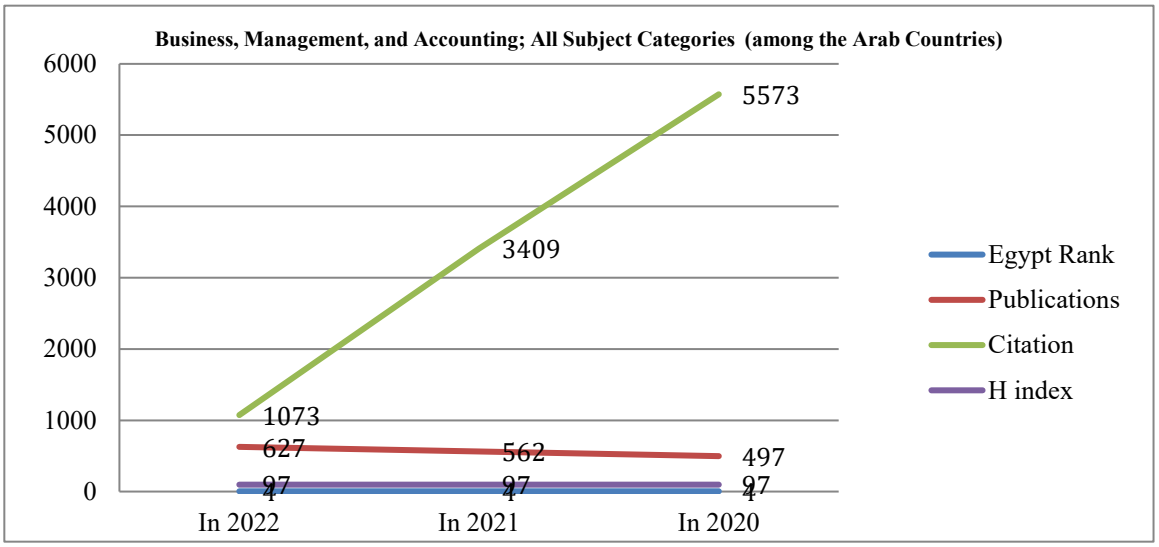

Figure 6: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting; All Subject Categories among the Arab Countries

** Source: Scimago Journal & Country Rank (2024)*

** Metrics based on Scopus® data as of April 2023*

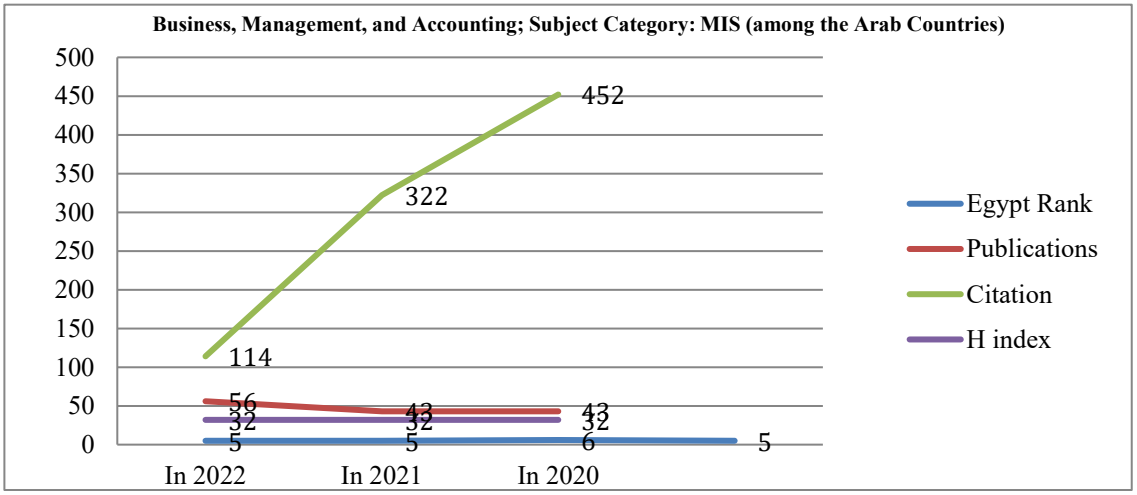

Figure 7: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting; Subject Category: MIS among the Arab Countries

** Source: c Journal & Country Rank (2024)*

** Metrics based on Scopus® data as of April 2023*

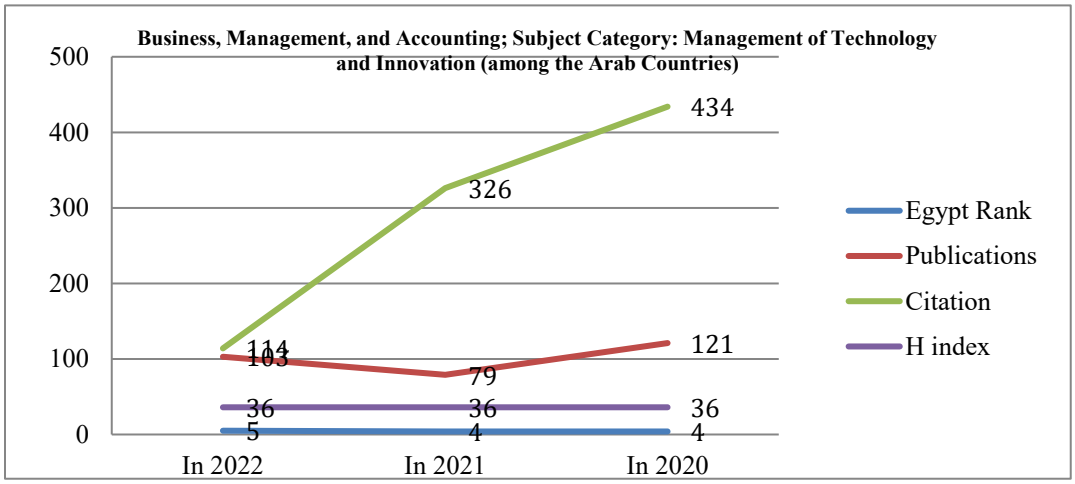

Figure 8: Rank, Publications, Citation Count, and H Index of Egypt in Business, Management, and Accounting; Subject Category: Management of Technology and Innovation among the Arab Countries

* *Source: Scimago Journal & Country Rank (2024)*

* *Metrics based on Scopus® data as of April 2023*

8. Bibliometric Analysis and Results

The Egyptian Knowledge Bank-EKB was visited to obtain the required source information that is the raw material for the conducted bibliometric analysis using the VOSviewer tool. The criteria of the main designed query for sources (search) are illustrated in Table 3 below.

Table 3: Main Sources Query Design

Query Fields	**Value**
Main Database	Scopus
Language	English
Year Ranges	2001:2024
Keywords	EB, E-Business, Electronic Business, e-Commerce, Electronic Commerce, Egypt
Status	Published, Open Access
Selected Retrieved Fields	Source Title, Year, Citations, Link, Author Keywords, Index Keywords, Open Access
Query Results	
Sources Retrieved Count (Year 2001:2024)	113 Sources & 1077 Citations
Sources Retrieved Count (Year 2014:2024)	84 Sources & 866 Citations

Table 4 shows the query outcomes distributed according to year, source count, and number of citations, as aggregated from The Egyptian Knowledge Bank-EKB (2024). The number of sources from 2001 to 2013 has reached 29 sources with 211 citations. Meanwhile, the number of sources in the last decade, from 2014 to 2024 has reached 84 sources with 866 citations. The sources retrieved count recorded 113 sources and 1077 citations for the years 2014-2024.

Table 4: Query Results Distribution (Year, Source Count, and Citations)

Aggregated from the Egyptian Knowledge Bank-EKB (2024) conducted query results

Year	Source Count	Citations
2001	**1**	**5**
2002	**2**	**36**
2005	**3**	**2**
2006	**1**	**6**
2007	**3**	**18**
2008	**2**	**20**
2009	**3**	**29**
2010	**4**	**21**
2011	**3**	**7**
2012	**4**	**36**
2013	**3**	**31**
Sub-Total	**29**	**211**
2014	**4**	**11**
2015	**4**	**30**
2016	**5**	**109**
2017	**2**	**193**
2018	**7**	**33**
2019	**2**	**12**
2020	**7**	**129**
2021	**9**	**65**
2022	**17**	**231**
2023	**15**	**22**
2024	**12**	**31**
Sub-Total	**84**	**866**
Total	**113**	**1077**

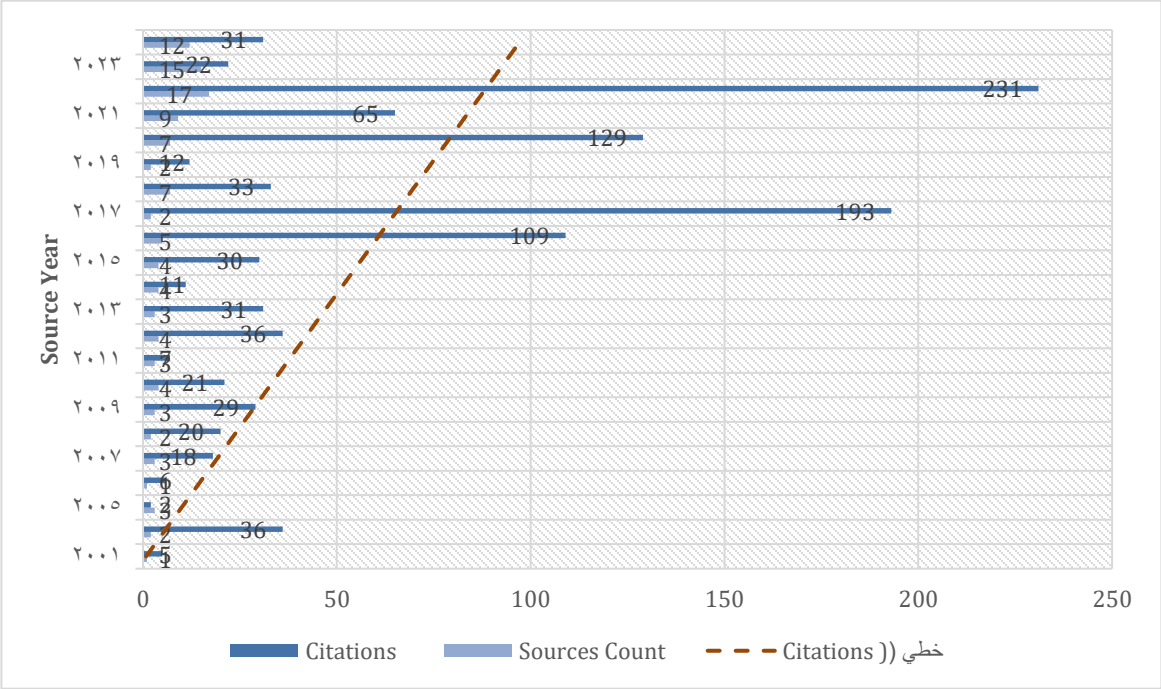

Figure 9: Query Results Distribution (Source Year, Source Count, and Citations) with Trend line Linear based on Citations

VOSviewer tool was used for visualizing EB bibliometric networks and developing the density visualization, overlay visualization, and network visualization (Figures 10, 11, and 12).

Table 5: Query Results (Clusters Distribution, Items Count, and List) Source: VOSviewer (2024)

Cluster Number and Items Count	Item List
Cluster 1 (10 Items)	Commerce, Decision Making, Developing Countries, Egypt, Electronic Commerce, Information Systems, Information Technology, Internet, Online Shopping, Recommender Systems
Cluster 2 (5 Items)	Authentication, Data Mining, Deep learning, Support Vector Machines, Websites
Cluster 3 (5 Items)	Customer Satisfaction , e-commerce, Information Management, Internet of things, Sales

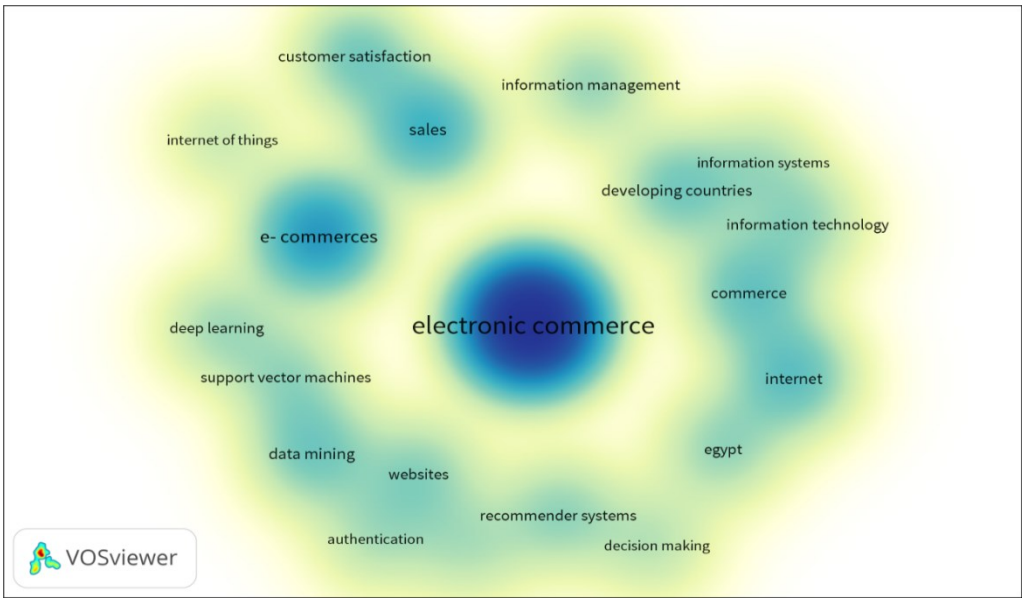

Figure 10: Density Visualization Source: VOSviewer (2024)

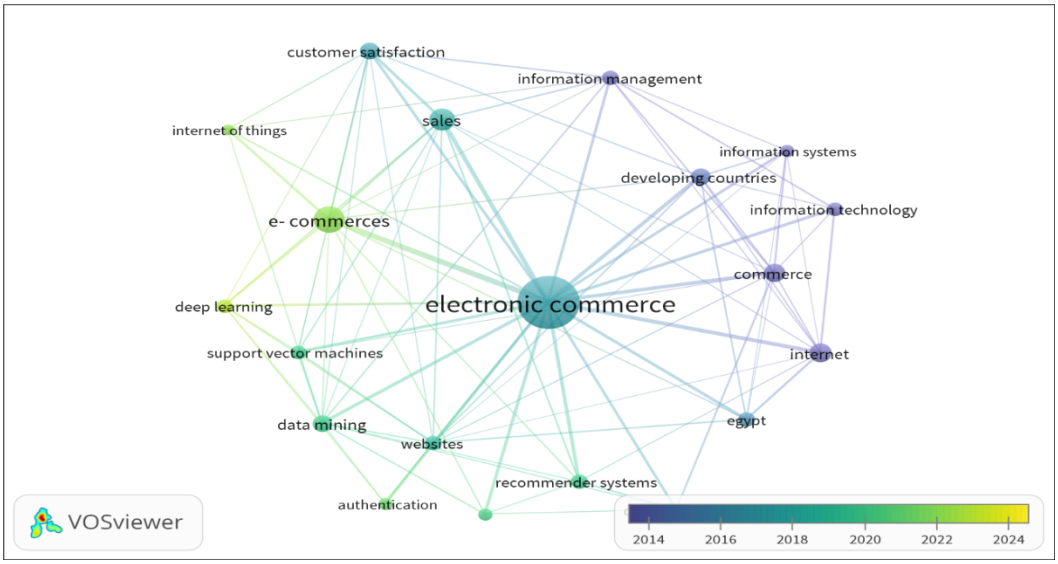

Figure 11: Overlay Visualization Source: VOSviewer (2024)

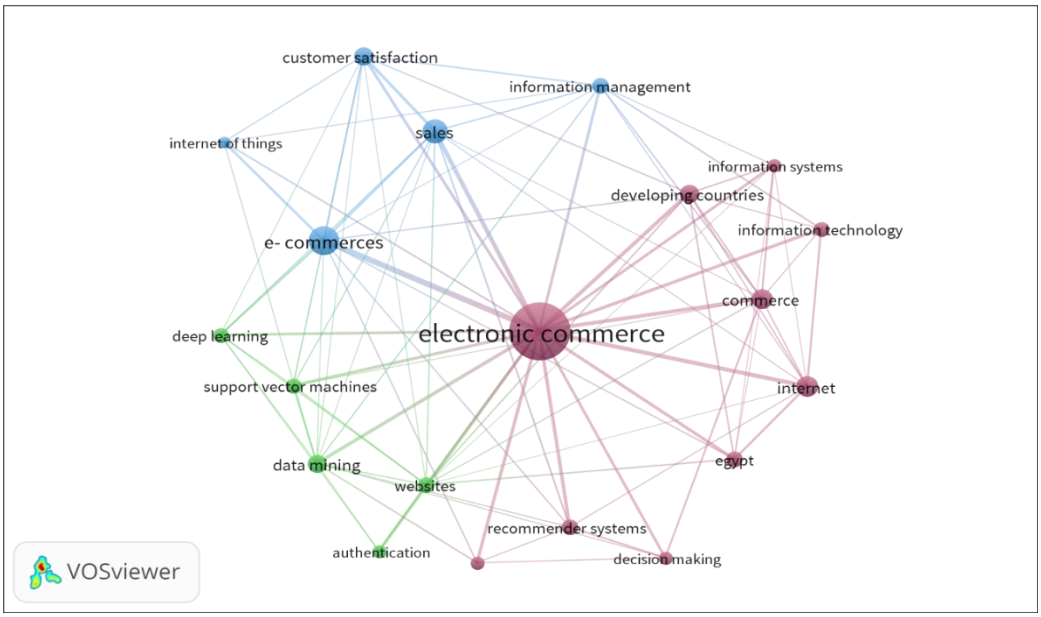

Figure 12: Network Visualization EB Source: VOSviewer (2024)

9. Conclusions

Technological improvements are endless, although the assurances of their advantages to business, the received benefits have variances among businesses. The previous studies provide varied, clear road maps on EB strategy development processes, levels, and stages.

It is not about how to develop EB strategy successfully; it's about how to maintain the gained business benefits, understand, analyse and expect your customer behaviour and intention within the rapidly changing environment and information technology innovations. Cyclic continuous product/services enhancements, ideas generation, assessment including risk management and management of changes and customer alternatives selection motives are currently more significant issues and areas to be considered. Thus, maintaining EB strategy benefits has mandatory changes and amendments ranging from minors to majors according to the firm's situation and readiness degree.

The research analyses early studies on EB models and strategies. The analysis shows a general interest in the prior EB studies on EB models and strategies production rather than their applications to the professional practices and best practices on how an enterprise can move from one stage to the following. The research indicates the need for further investigations in developing a guide for EB strategy implementation and managing the required changes, especially with the natural risks such as pandemics and the new EB generated models, i.e., social commerce, regardless of the business sector.

Although having the aim of appraising scientific literature and identifying trends and influential research within a field, bibliometric analysis is a powerful tool that provides valuable insights; it must be adopted with caution; make sure that the correct data interpreting aligns with an augmented critical analysis. The bibliometric analysis method evolved continuously. Supported by applications growth across different fields and disciplines, emphasizing its importance in recent research evaluation.

However, the potential data misinterpretation and the need for critical analysis beyond mere data collection are still inherent restrictions. A clear understanding of the metrics used and careful research questions, consideration, and data extraction methods are essential for obtaining an effective bibliometric analysis (Greener, 2022; Klein & Bloom, 2008).

Generally, these studies provide a comprehensive overview of the current state of research in digital transformation, identifying main trends, influential contributors, and potential areas for future exploration. Both academics and practitioners get the advantage of such studies valuable resources, which enable the target to harness the benefits of digital transformation in various organizational and business strategy contexts.

Egypt has occupied good positions across both the countries of Africa, and the Arab countries as well regarding the intellectual contributions in the period from 2020 to 2023. These positions have almost remained stable during the years from three years, having the fact of the dramatic impact of the COVID-19 that activated the digital and electronic formats of business and maximized its values. Taking into consideration the governmental initiatives and continuous development in the ICT sector that were triggered by the public technology adoption interest in a global and country levels.

10. Future Directions

The presence of EB and related technologies permitted business integration and eliminated boundaries, smoothly resulting in reshaping different businesses and creative thinking on how businesses run. Moreover, the current EB models covered many activities through sectors across countries. These major changes need to be investigated; promote more research to be performed in the EB field. Based on earlier sections, the performed review of previous, recent EB research and the EB bibliometric analysis, the density, overlay, and network diagrams, the key themes of the upcoming studies are expected to continue to cover: E-government services, personalization, risk management, management of change, and social media application. Meanwhile, future works in the EB and DT areas will include, but are not limited to following topics and trends, evaluating the experiences of DT, social networks and m-commerce applications, social media commerce and online shopping, customers' intention, and behaviour reasoning, social media commerce benefit realization and measurement, evaluation of social media e-Customer Relationship Management CRM and customer satisfaction, Internet of Things (IoT), recommender systems, assessment of E-government services and impact, e-portals personalisation, e-services, and digital products customization, implications of environmental risks and pandemics on business processes, and DT strategies, model selections, and adoption, and best practices on risk management and management of changes.

Additionally, the intellectual contributions and scientific research considering Egypt, basic themes, and trends in general and EB and ICT in particular are intense subjects of upcoming research; considering the rapid development in the ICT and in the country, public attention and awareness were observed during the COVID-19 pandemic and continue. Moreover, assessing the influences of these continuous developments and governmental initiatives in the area of ICT on the e-business activities and e-government services is a vital step to identify the current position before going on through the execution of the ICT strategic development plan, which the areas of upcoming research cover EB and DT in Egypt include but are not limited to: assessing the impact of social media on e-CRM, customer satisfaction and consumer behaviour, developing a country-based EB and DT investigations considering the current successful initiatives and sectors, evaluating the adoption level of EB, assessing the maturity level of e-

government portal, usability and intention to use of mobile applications services, usability and acceptance e-government services, Critical Success Factors (CSFs) of EB and DT initiatives in Egypt, readiness of e-services digital transformation in public and private business firms, and in different business sectors as well. In addition, the necessity of studying best practices in managing change and risk management in other successful initiatives in Egypt.

References

Barros, M. & Mesquita, A. (2020). E-Business in Pandemic Context - A Systematic Literature Review. In: Abreu A., Liberato D., González E.A., Garcia Ojeda J.C. (eds) Advances in Tourism, Technology and Systems. ICOTTS 2020. *Smart Innovation, Systems and Technologies*, Vol 209. Springer, Singapore. https://doi.org/10.1007/978-981-33-4260-6_46

Chaffey, D. (2007). *E-Business and E-Commerce Management*, 3rd Edition, Prentice Hall.

Chaffey, D., Ellis-Chadwick, F., Mayer, R.& Johnston, K.(2006). *Internet Marketing Strategy, Implementation and Practice*, 3rd edn, Financial Times Prentice Hall- Harlow

Chawla, R., & Goyal, P. (2021). Emerging trends in digital transformation: a bibliometric analysis. Benchmarking: An International Journal. https://doi.org/10.1108/bij-01-2021-0009

Chen, J., & Shen, L. (2024). A Synthetic Review on Enterprise Digital Transformation: A Bibliometric Analysis. Sustainability. https://doi.org/10.3390/su16051836

Choudhri, A., Siddiqui, A., Khan, N., & Cohen, H. (2015). Understanding bibliometric parameters and analysis.. Radiographics : a review publication of the Radiological Society of North America, Inc, 35 3, 736-46. https://doi.org/10.1148/rg.2015140036

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business Research, 133, 285-296. https://doi.org/10.1016/J.JBUSRES.2021.04.070

Egypt ICT indicators (n.d.). Ministry of Communications and Information Technology, http://www.egyptictindicators.gov.eg/en/Pages/page3.html

Ellegaard, O. (2018). The application of bibliometric analysis: disciplinary and user aspects. Scientometrics, 116, 181 - 202. https://doi.org/10.1007/s11192-018-2765-z

Feng, L. (2006).What Next ? , What is E-Business and does it matter? Definitions and Emerging E-Business Models, pp ,The Business School, University of Newcastle upon Tyne

Galli, M.(2021). E-Business and E-Commerce Models and Components,Walden University, https://www.researchgate.net/publication/355484828_E-Business_and_E-Commerce_Models_and_Components

Greener, S. (2022). Evaluating literature with bibliometrics. Interactive Learning Environments, 30, 1168 - 1169. https://doi.org/10.1080/10494820.2022.2118463

Hackbarth, G., & Kettinger, W. (2000). Building An E-Business Strategy, *Information Systems Management*, Vol.17, no. 3,pp. 78-93

Haryanti, T.& Subriadi, A. (2020). Factors and Theories for E-Commerce Adoption: A Literature Review, *International Journal of Electronic Commerce Studies,Vol.11, No.2,* pp.87-106, 2020, doi: 10.7903/ijecs.1910

Hajli, N (2019). The impact of positive valence and negative valence on social commerce purchase intention, Information Technology & People

Hajli, N. & Shirazi, F. (2021).Introduction to the Special Issue on Social Commerce Advancements and New E-commerce Technologies: The Current Challenges, *Journal of Electronic Commerce Research*, VOL 22, NO 1, 2021

Johnson, G. & Scholes, K.(1999). *Exploring Corporate Strategy,* Prentice Hall Europe

Judijanto, L., Made, I., Suwandana, A., Cori, C., & Paramita, P. (2024). Barriers to Digital Transformation in SMEs: Insights from a Bibliometric Analysis. West Science Business and Management. https://doi.org/10.58812/wsbm.v2i02.987

Khurana, A. (2020). A look at the differences between E-business and e-Commerce. The Balance Small Business. https://www.thebalancesmb.com/ebusiness-vsecommerce-1141573

Kaparthi, S. (2012). A Bibliometric Analysis. Journal of Decision Systems, 14, 157 - 177. https://doi.org/10.3166/jds.14.157-177

Klein, W., & Bloom, M. (2008). Bibliometrics. Social Work in Health Care, 41, 117 - 121. https://doi.org/10.1300/J010v41n03_07

Kokol, P., Vošner, H., & Završnik, J. (2020). Application of bibliometrics in medicine: a historical bibliometrics analysis.. Health information and libraries journal. https://doi.org/10.1111/hir.12295

Laudon, K. C & Carol Guercio, T. (2003). *E-Commerce: Business, technology and society*. 2nd edition. Pearson Addison Wesley, Boston

Lynch, R . (2000). *Corporate Strategy*, 2nd ed., Financial Times Prentice Hall, Harlow

McDonald, M. (1999). *Strategic Marketing Planning: Theory and Practice*, The Marketing Book

Merigó, J., & Yang, J. (2017). Accounting Research: A Bibliometric Analysis. Australian Accounting Review, 27, 71-100. https://doi.org/10.1111/AUAR.12109

Ministry of Communications and Information Technology - MCIT. (2024). ICT Indicators in Brief, January 2024 | Monthly Issue, https://mcit.gov.eg/Upcont/Documents/Publications_1922024000_ICT_Indicators_in_Brief_January_2024.pdf

Ministry of Communications and Information Technology - MCIT. (2021). ICT Indicators in Brief | Monthly Issue", October 2021, https://mcit.gov.eg/Upcont/Documents/Publications_24112021000_ICT_Indicators_in_Brief_October_2021_24112021.pdf

Moral-Munoz, J., Herrera-Viedma, E., Santisteban-Espejo, A., & Cobo, M. (2020). Software tools for conducting bibliometric analysis in science: An up-to-date review. El Profesional de la Información. https://doi.org/10.3145/epi.2020.ene.03

Moresi, E., Da Silva Alves, W., Da Silva, A., & Hedler, H. (2024). Digital transformation in the public sphere: a bibliometric analysis. Ciência da Informação. https://doi.org/10.18225/ci.inf.v52i2.7099

Nazir, M. & Roomi, M. (2020). Barriers to Adopting Electronic Commerce for Small and Medium-sized Enterprises in Emerging Economies, Emerging Markets Journal (EMAJ), ISSN 2158-8708 (online), DOI 10.5195/emaj.2020.203, http://emaj.pitt.edu Vol 10, No 2

https://emaj.pitt.edu/ojs/index.php/emaj/article/view/203

Porter, M. (2001). Strategy and the Internet, *Harvard Business Review*, March 2001, 62–78.

Scimago Journal & Country Rank (2024).https://www.scimagojr.com/ (Accessed: March 11, 2024)

Shi, L., Mai, Y., & Wu, Y. (2022). Digital Transformation: A Bibliometric Analysis. J. Organ. End User Comput., 34, 1-20. https://doi.org/10.4018/joeuc.302637

Singh, M. (2004). Innovation and Change Management. In M. Singh, & D. Waddell (Eds.), *E-Business Innovation and Change Management* (pp. 1-18). IGI Global. http://doi:10.4018/978-1-59140-138-4.ch001

Smith, P.(1999). *Marketing Communications: An Integrated Approach*, 2nd ed., Kogan Page, London.

Taib, A., Nasir, N., & Awang, Y. (2024). Digitalization and Digital Capabilities in Business Performance: A Bibliometric Analysis. Advances in Social Sciences Research Journal. https://doi.org/10.14738/assrj.119.2.17397

The Egyptian Knowledge Bank-EKB (2024). https://www.ekb.eg/ar/home (Accessed: October 3 2024)

Turban, E., King, D., Lee, J., Liang, T. & Turban, D. (2012). *Electronic Commerce 2012: A Managerial and Social Networks Perspective*, Global Edition . Pearson Prentice Hall

Turban, E., King, D., Lee, J. & Viehland, D. (2004). *Electronic Commerce: A Managerial Perspective* 2004. Pearson Prentice Hall, New Jersey

United Nations (2021a). How COVID-19 triggered the digital and e-commerce turning point, United Nations Conference on Trade and Development, 15 Mar 2021, https://unctad.org/news/how-covid-19-triggered-digital-and-e-commerce-turning-point

United Nations (2021b). National Technical Guidelines on E-Accessibility for the Arab Region, Economic and Social Commission for Western Asia, https://www.unescwa.org/sites/default/files/pubs/pdf/national-technical-guidelines-e-accessibility-arab-region-english_0.pdf

United Nations (2021c). EGDI, Egypt, Country-Information, Department of Economic and Social Affairs, Division for Public Institutions and Digital Government, https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/53-Egypt

VOSviewer (2024). https://www.vosviewer.com/ (Accessed: October 7, 2024)

Venkataraman, N. (2000). Five steps to a dot-com strategy: How to find your footing on the web. *Sloan Management Review*, Spring, 15–28.