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Toward Better Digital Transformation (DT): A Systematic Review (SR) of E-government Literature in Egypt

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Abstract

The research aims to offer guidance on information sources of the main contributors to the e-government development in Egypt and discover their different outlooks. This research carried out a comprehensive literature analysis of selected impactful and informative literature concerning e-government in Egypt from the Scopus database, conducted from 2004 to 2024. The research recognized and summarized the current stage of e-government in Egypt, emphasized the existing research gap, and highlighted the future studies' key themes and directions based on the conducted systematic analysis. This research provides a better understanding of the development of e-government in Egypt and its current stage-related issues and enriches academics' and specialists' awareness of e-government in Egypt-related aspects as a step toward better digital transformation.

Keywords

Digital Transformation (DT), Systematic Review (SR), E-government Literature in Egypt, The Egyptian Knowledge Bank (EKB), Scopus Database

1. Introduction

In Abdel-Fattah & Galal-Edeen (2008), a preliminary framework with a multi-perspective assessment was offered. Factors such as stakeholder and specific contextual have been taken into account. This spotlighted the absence of an integrated assessment framework for e-government websites. The local government websites in Egypt maturity levels were evaluated by Abdelsalam et al. (2011). However, the relationship between e-government maturity, citizen engagement, and the provision of effective public services more investigations at the local level are still required. Although the opportunities and challenges associated with m-government in Egypt were considered in Eldeeb et al. (2013). Empirical research evaluating the initiatives in Egypt was still rare. These required researches should cover the delivery of service, satisfaction of the citizen, and general digital division. Meanwhile, e-government adoption factors were investigated in Abdel-Fattah (2014). They investigated the individual, service, and governmental factors. The study didn't cover the impact of the social and cultural factors in Egypt and their roles on citizens' willingness to adopt e-government services. In the same year, 2014, a citizen-centric e-Government Service Index (ESI) model was developed by Zakaria et al. (2014). To have the outcome model unified and fit the real citizens' feedback from Egypt, a practical validation of this model with a larger sample was essentially needed. The role that social networks play in enhancing e-rulemaking has been investigated in Hassan & Abdelghaffar (2015). The study highlights the necessity for further research on how social networks can be integrated into e-rulemaking processes effectively, resulting in citizen participation improvement, transparency, and communication with the Egyptian government. In the chapter by Azab et al. (2015), the Arab countries were considered in investigating the Web 2.0 technology acting in e-participation augmentation. The Egyptian context was recommended in this chapter to be covered in specific research. Considering to what extent the Egyptian government makes the most of Web 2.0 tools effectively on the way to citizen involvement and transparency encouragement. Although the digital transformation process was provided in one of the recent studies by Abdallah et al. (2022), the study concerned the manufacturing sector. There is a need for conducting additional research to measure this process from a

practical angle and implement it in the manufacturing businesses in Egypt and identify key challenges and opportunities associated with this sector.

2. Previous Studies

Ezz (2007) discussed the organisational challenges of adopting e-government in Egypt. Meanwhile, the Abdel-Fattah & Galal-Edeen (2008) paper represents a starting point with its preliminary framework, but it highlights the need for future research to develop and test a more effective framework. They are highlighting the importance of developing a framework that can be used to effectively evaluate e-government websites and improve their quality. They reported the ineffective e-government websites, wasted resources, and limited e-government adoption as implications of the research gap of the absence of a robust evaluation framework. Galal-Edeen & Abdel-Fattah (2008) discussed the use of multiple communication channels for delivering e-government services. Citizens' readiness for e-government in developing countries was examined in Abdelghaffar (2009); he examined factors such as e-readiness and trust. Azer et al. (2009) addressed the security challenge of wormhole attacks in wireless ad hoc networks. Abdel-Fattah & Galal-Edeen (2009) argued for the use of an interpretive paradigm for evaluating e-government systems. Hamad & Khedr (2009) proposed an authentication protocol for ad-hoc networks, relevant to securing e-government systems. In 2010, the associated commerce business models to understanding the potential of e-government to facilitate online transactions and services were studied by Nagaty (2010).

Meanwhile, Klischewski & Ukena (2010) examined the potential of the Semantic Web to improve e-government services. They reported that semantic web technologies require machine-readable updates to web resources and the lack of guidance for administrations on how to adopt these technologies. In addition to examining the key challenges and mandatory changes associated with experiences. Moreover, how administrations can better process information using the semantic web. Sobh & El-Fiqi (2011) proposed a solution: a preliminary evaluation multiple perspectives framework as a starting point and emphasised the essential need for more development and validation requirements to become a reliable and practical

tool for e-government website assessment in Egypt. They reported the insufficiency of the existing evaluation methods, as the evaluation methods lack being comprehensive and integrated for e-government website quality evaluations that suit the Egyptian context.

Elhennawy et al. (2011) studied and discussed adapting the Family Card System using smart cards, improving service delivery for subsidies and welfare. According to Elhennawy et al. (2011), the Egyptian government has developed policies to give subsidies to citizens, but there are challenges in determining who deserves them and monitoring how funds are used. The new smart family card will replace the old ration book, allowing electronic tracking of subsidies to prevent waste and fraud. Reddick et al. (2011) examined e-government factors that influence administrative discretion through a survey of local governments. The study proved that e-government factors of collaboration and organisational change influenced administrative discretion. The study outcomes implied that local governments should be working on improving e-government to reduce administrative discretion, in the increasing collaboration area in particular. Reddick et al. (2012) analysed the availability of e-services on local government websites.

E-marketing as a new marketing philosophy, relevant to e-government services and communications, was discussed by El-Gohary (2012). Citizen was considered in El-Shetehy (2012), who focused on citizen perception of the Egyptian e-government portal after the revolution. The study was conducted in response to the shortage of related research conducted in Middle Eastern countries, in addition to the increased responsibility towards Internet applications that are concerned.

In 2013, m-government opportunities and challenges in Egypt were explored by Eldeeb et al. (2013). Their study reported that although there are several opportunities for developing m-government applications for Egyptian society, the existing challenges facing m-government in Egypt can be avoided by good governance. The authors stressed the cooperation between all the republic authorities for the effectiveness and efficiency of m-government projects is mandatory. The adoption of Government Enterprise Architecture (GEA) in Egypt and Syria was investigated by Mohamed et al. (2013). Abdelghaffar & Sameer (2013) investigated the potential of social

networks to facilitate e-democracy in Arab Spring countries, relevant to Egypt. Algergawy & Saake (2013) studied combining features for web data sources clustering to improve search and retrieval functionalities on e-government websites. Sameer & Abdelghaffar (2015) examined social networks' potential to enhance citizen inclusion and participation in rulemaking. Almasoud et al. (2018) examined the integration between Artificial Intelligence (AI) and blockchain technology affecting factors, with potential implications for automating and improving e-government processes. As well as how it could be integrated for forecasting and automating; building a self-regulated chain. Elashmawy et al. (2021) focus on spatio-temporal attention mechanisms and knowledge distillation for lip reading, which have applications in developing accessible e-government services for people with disabilities. The proposed model combines three contributions.

According to Elbatanouny et al. (2023), Egypt began investment in communication and IT infrastructure in 1985, but fully implementing m-government applications was challenged by a variety of challenges; these are mostly attributable to the typical obstacles of any government development. Authors stated the citizens' advantages of various m-government services adoption. Suggested how Egyptian m-government could evolve moving forward as well.

The e-government influence on a battery of governance indicators in a sample of 17 Middle East and North African countries during the period 2003-2019 was investigated by Al-Refai & Saad (2024). Based on advanced econometric tools consisting of second-generation panel data techniques, the analysis was conducted. The study reported the absence of impact of e-government on voice and accountability, government effectiveness, and regulatory quality. The short-run analysis confirms that there are no effects on governance as well.

Madaki et al. (2024) conducted a systematic review and comprehensive examination of IT integration in the e-government sector from 2004 to 2024. The authors examined factors impacting the success of integrating information technology (IT) in developing countries' e-government sectors. Additionally, the authors identified unique challenges and benefits,

emphasizing management's role and proposing innovative frameworks for future research. The way Egypt's socioeconomic environment is affected by important digital transformation policies was focused on Aboul-Dahab (2024), with a particular emphasis on rules supporting social inclusion, growth, cybersecurity, and public service quality. The chief study concluded policies were data protection legislation, e-government programs, telecom rules, digital economy strategies, and cybersecurity frameworks. The researcher used a Policy Impact Matrix in the evaluation.

Recently, in 2025, how effort and performance expectancy and trust in governmental services impact Egyptian citizens' attitude toward using e-government was examined by Haridy et al. (2025). The authors developed a conceptual framework integrating the effort expectancy and performance expectancy constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT). The study outcomes reported the strong impact of attitudes on the intention to use e-government in Egypt; additionally, the attitudes are determined by effort and performance expectancy. However, trust in e-government services, on the other hand, has an insignificant influence on citizens' attitudes.

Figure 1 below summarises the key research areas associated with e-government in Egypt and was the subject of the previous studies in e-government. These studies concerning e-government: the adoption and diffusion, assessing e-government websites, citizen-centric e-government service, the impact of social networks on e-rulemaking, mobile government (M-government) in Egypt, e-participation and government 2.0 in Arab countries, e-government maturity of Egyptian local governments, and digital transformation in the Egyptian manufacturing sector.

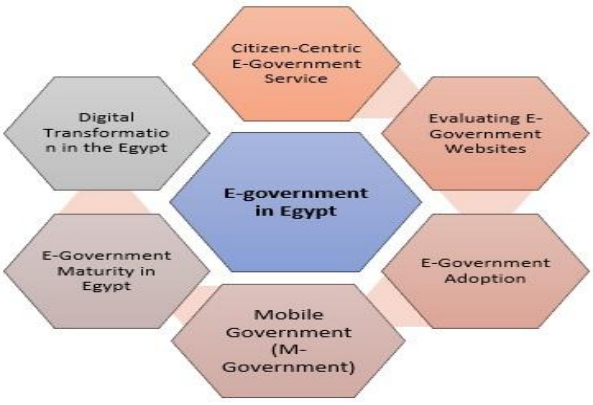

Figure 1: The Key Research Areas Associated with E-government in Egypt

The structure of this study is outlined through the coming lines. The following section covers the study objectives and methods. Explanations of the conducted research processes are also provided. In section four, research conducted analysis outcomes were offered. The research results were presented in section five. Highlighting and discussing the research outcomes' contribution and importance is provided through section six: discussion. In the last section, conclusions, the research findings are offered, and the nomination of future studies key themes and issues are identified as well.

3. Research Objectives and Methods

3.1 Research Objectives:

The research objectives can be summarised as follows:

- **Surveying the previous studies that covered e-government in Egypt in terms of main areas, themes and issues.**
- **Analysing the recent studies on the same topic to identify the research gap and the active authors and researchers who have an intellectual contribution in the Scopus database in the years from 2004 to 2024.**
- **Highlighting e-government in Egypt upcoming studies themes and topics taking into account the analysed studies.**

3.2 Research Methods

The planned literature review of this research was divided into two main stages on selected published scientific studies. The initial search and survey process was covered with related and informative e-government in Egypt literature to provide a clear general context on the topic (the initial collection – Introduction and Literature Review part). Then the second survey stage was conducted on the impacted and informative from 2004 to 2024. These publications resulted from visiting the Egyptian Knowledge Bank (EKB) and running a query on the Scopus database based on identified filtering factors. The second stage survey process covered the outcome publications and sources information provided from the performed query, which became the basic data file to produce the density visualisation overlay and network visualisation diagrams using the tool in the next step. Then, the publication collection VOSviewer was considered and revised to draw accumulated

conclusions, trends and themes of the future works based on the identified research gaps. The final outcomes and discussion were provided.

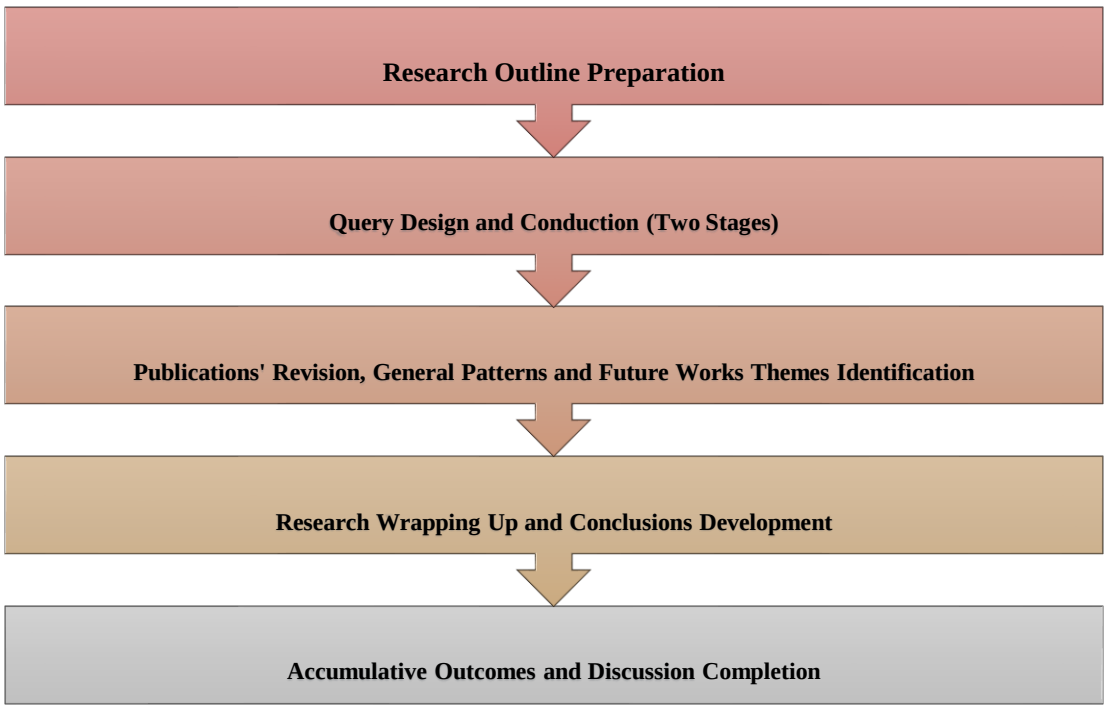

Figure 2: Research Phases

This research compresses five phases, as demonstrated in Figure 2: Research Phases. The plan of the research was portrayed in the first phase: research outline preparation. The required information of publications was obtained through two stages in the second phase (query design and conduction). In the next phase: publications' revision, general patterns and future works Theme identification; processing of the obtained publications information was performed. Later, the development of research conclusions was drawn in the research wrapping-up and conclusions development phase. In the final phase, accumulative outcomes and discussion completion, accumulated research outcomes and discussion were provided.

4. E- Government in Egypt: Bibliometric Conducted Analysis and Results

To obtain the needed e-government in Egypt publications and scientific sources basic data, the Egyptian Knowledge Bank (EKB) was the chief visited platform. The Scopus database was chosen for conducting the designed query. The retrieved query information acts as raw material for executing a bibliometric analysis using the VOSviewer tool. Table 1

demonstrates the details of the designed query for obtaining publications and sources.

Table 1: Details of the Designed Query for Obtaining Publications and Sources

Designed Query Main Parameters	
Database	**Scopus**
Publication Source Type	**Journal Article Or Conference Paper Or Book Chapter**
Publication Year Range	**From 2004 to 2024**
Main Language	**English**
Keywords	**Electronic Government, e-government, E-government, E-Government, Government Data Processing AND Egypt**
Query Results	
Count of Sources Retrieved (2004:2024)	**21 Sources & 201 Citations**

Figure 3 below shows the query outcomes distributed according to article count and number of citations, as aggregated from The Egyptian Knowledge Bank-EKB (2024). It showed a decline in the number of publications from 2015 to 2024 compared to the years from 2009 to 2014 that had the greatest number of publications and citation counts. Figure 4 was drawn based on aggregated data from the Egyptian Knowledge Bank-EKB (2024) conducted query results; it displays a radar diagram that was developed for the query results in terms of article count and citation number.

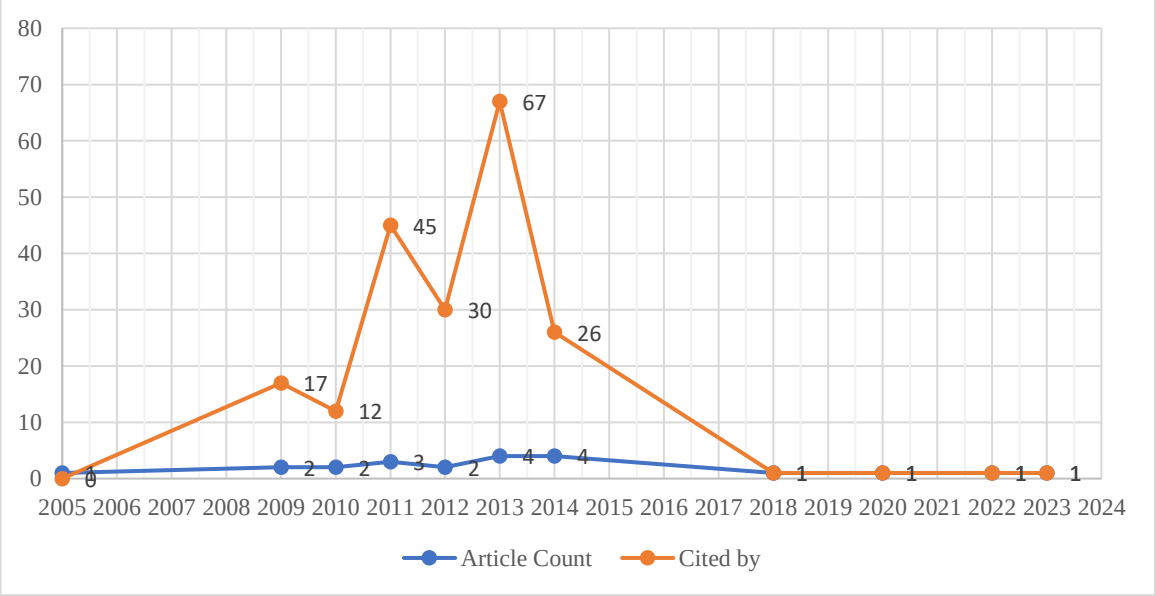

Figure 3: Query Results Distribution (Article Count and Citations)

Drawn based on aggregated data from the Egyptian Knowledge Bank-EKB (2024), conducted query results

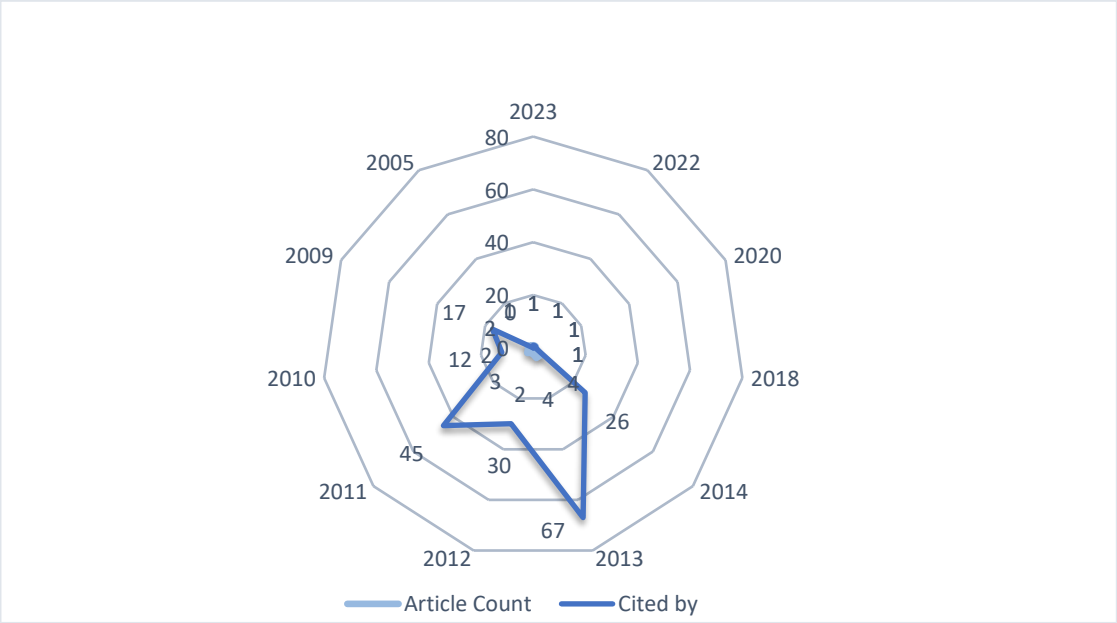

Figure 4: Radar Diagram for Query Results (Article Count and Citations)

Drawn based on aggregated data from the Egyptian Knowledge Bank-EKB (2024), conducted query results

The query outcomes were categorised into conference paper, article, and book chapter based on total publication of each year, as Figure 5 illustrated.

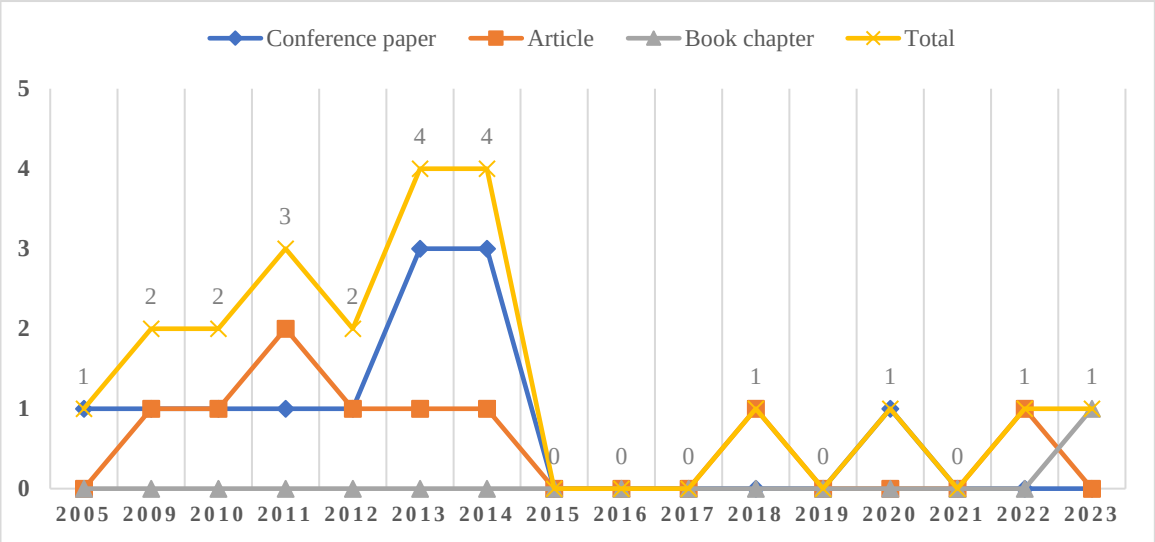

Figure 5: Distribution of Query Outcome into Conference Paper, Article, and Book Chapter Based on the Total Publication of Each Year

Drawn based on aggregated data The Egyptian Knowledge Bank-EKB (2024) conducted query results.

For visualising networks, overlay, and density for the retrieved sources from the conducted query, the VOSviewer tool was used. The networks visualisation, overlay visualisation and the density visualisation were displayed in (Figures 6, 7, and 8).

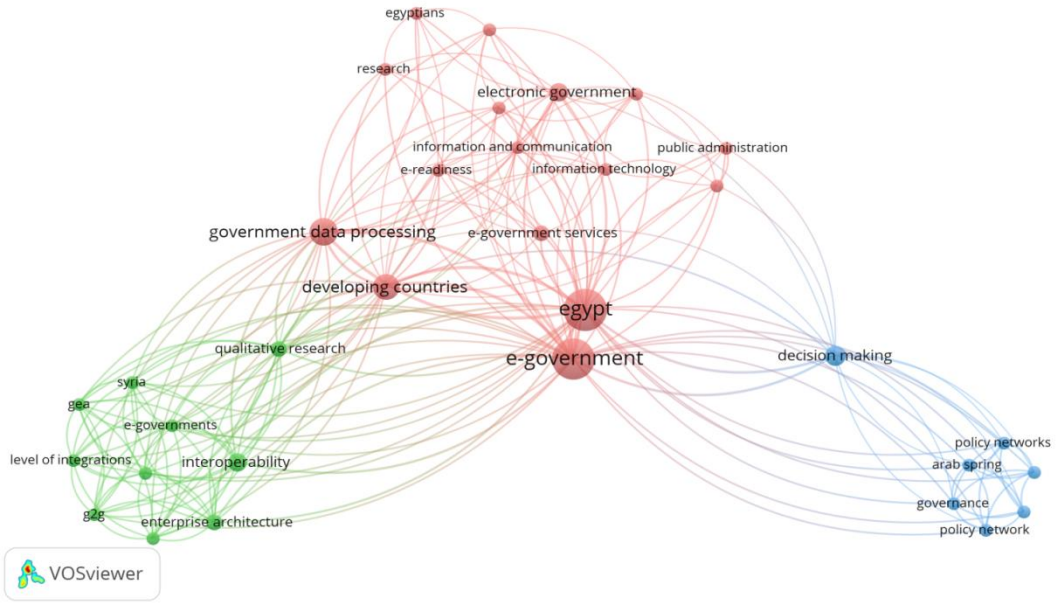

Figure 6: Network Visualisation E-government (87 Keywords) Source: VOSviewer

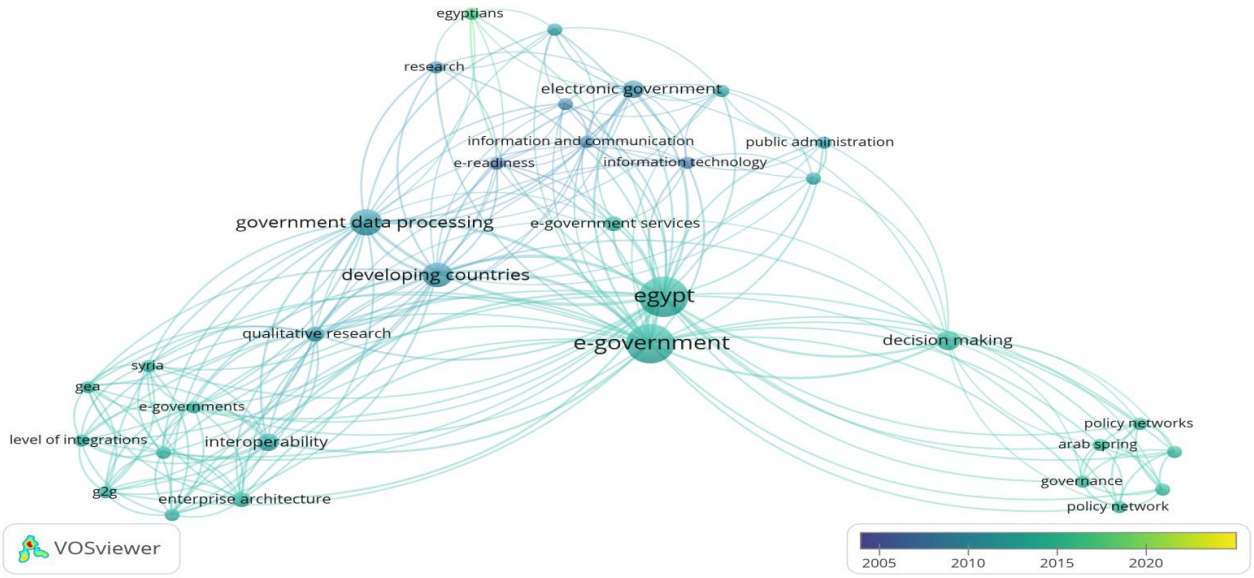

Figure 7: Overlay Visualisation E-government (87 Keywords) Source: VOSviewer

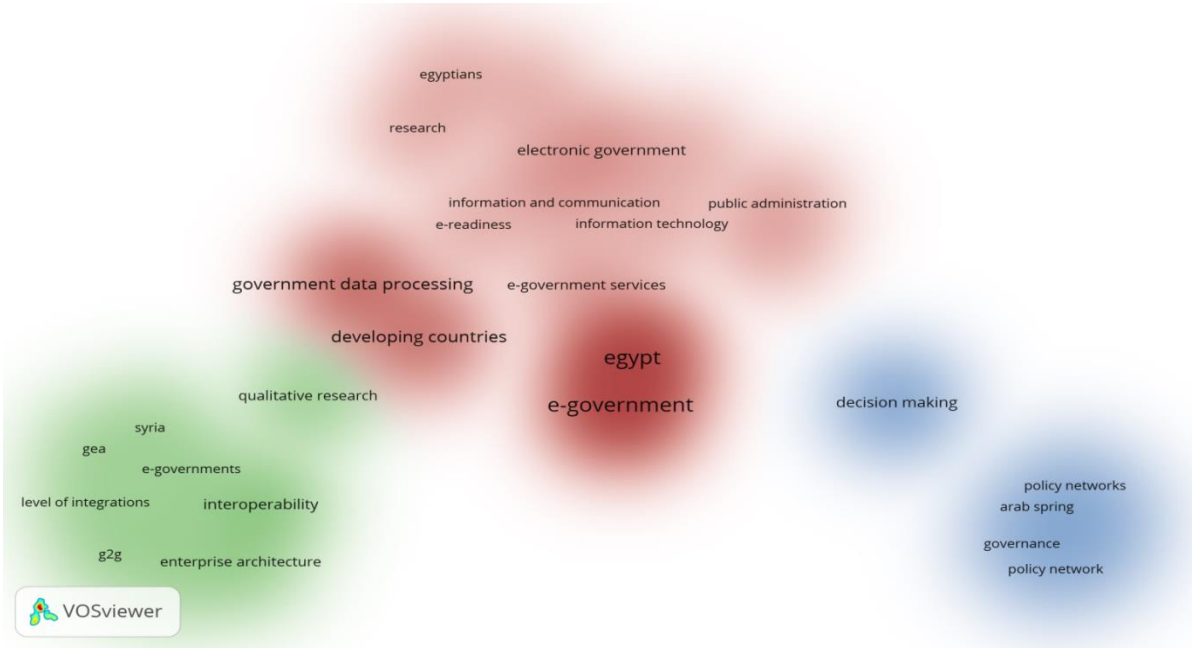

Figure 8: Density Visualisation E-government (87 Keywords) Source: VOSviewer

The number of the keywords reached 87 in the obtained query outcomes, with occurrences ranging from 1 to 21 occurrence times. Figures 9, 10 and 11 demonstrated the networks, overlay, and the density visualisation for the keywords of the obtained publications.

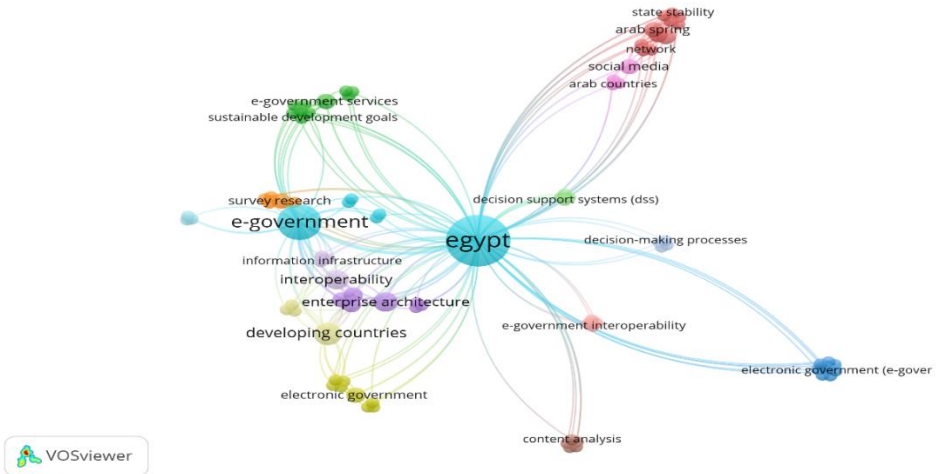

Figure 9: Network Visualisation E-Government (87 Keywords) Source: VOSviewer

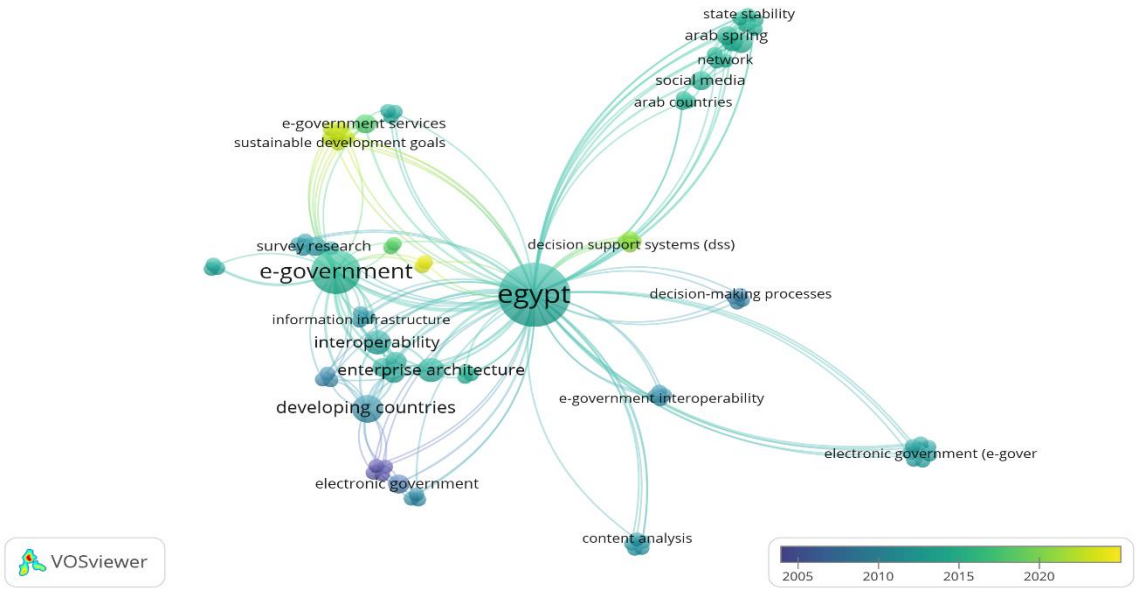

Figure 10: Overlay Visualisation E-Government (87 Keywords) Source: VOSviewer

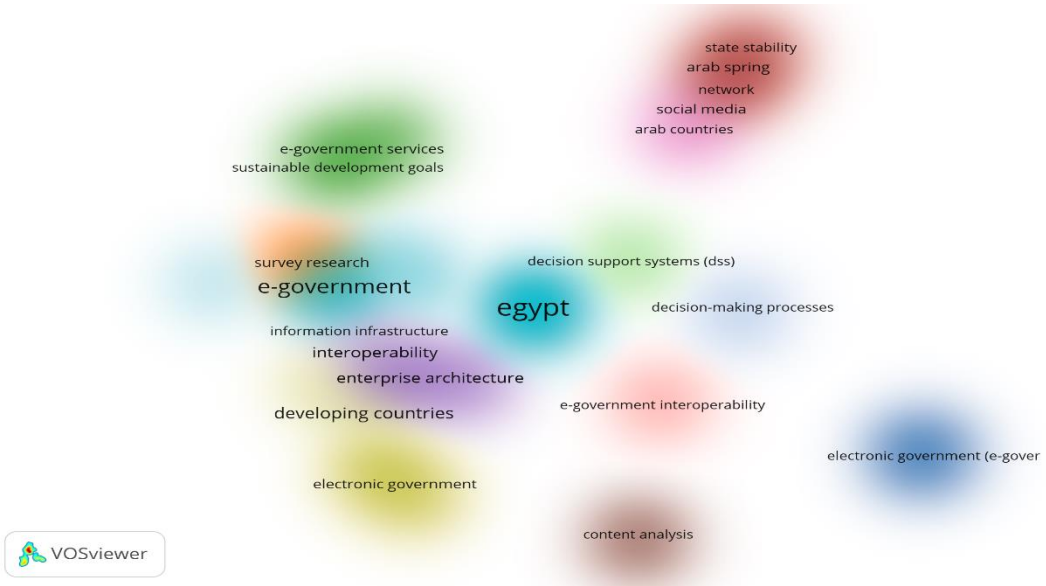

Figure 11: Density Visualisation E-Government (87 Keywords) Source: VOSviewer

The occurrences of the keywords ranged from 1 to 21. The largest occurrence was for 'Egypt' = (21); it has a total link strength of 39. Figure 12 below shows the radar diagram for (87) keywords, each with its %. Due to the large number of keywords with only one occurrence (72 keywords) and the weak strength resulted from the large portion (82.7%) of them

comparing to the keywords with two and above occurrences of the total keywords.

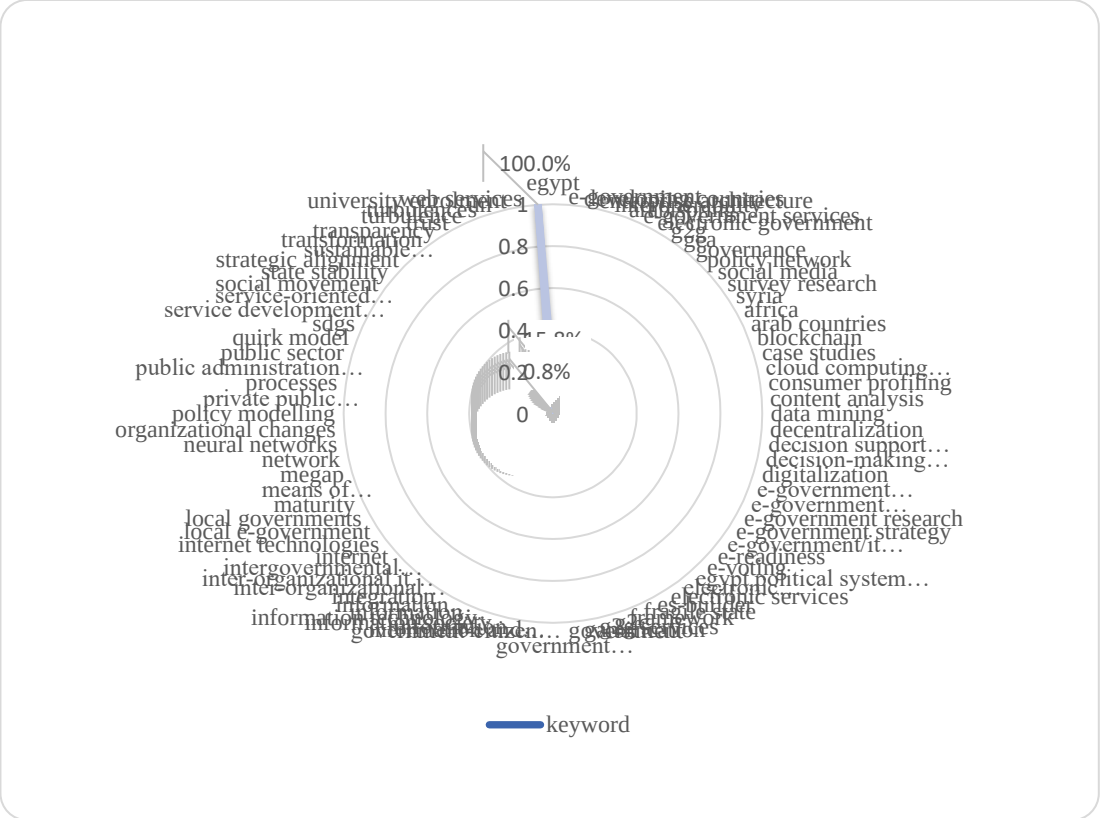

Figure 12: The Radar Diagram for (87) Keywords and %

At this point the decision was to not consider the keywords with only one-time occurrences. After eliminating these keywords, the total number of keywords decreased and reached 15 keywords. Table 2 illustrates the 15 keywords, occurrence >=2, and total link strength. Figures 13 and 14 were drawn based on aggregated data from the VOSviewer. The (15) keywords, occurrences and its total link strength were illustrated in Figure 13; meanwhile, the (15) keywords and their % of total links were shown in Figure 14.

Table 2: The (15) Keywords, Occurrence >=2, and Total Link Strength (Aggregated data from VOSviewer)

Keyword	Occurrences	Total Link Strength
Egypt	**21**	**39**
E-government	**10**	**26**
Developing Countries	**4**	**18**

Keyword	Occurrences	Total Link Strength
Enterprise Architecture	3	15
Interoperability	3	16
Arab Spring	2	7
E-government Services	2	3
Electronic Government	2	3
G2G	2	14
GEA	2	14
Governance	2	7
Policy Network	2	7
Social Media	2	5
Survey Research	2	4
Syria	2	14

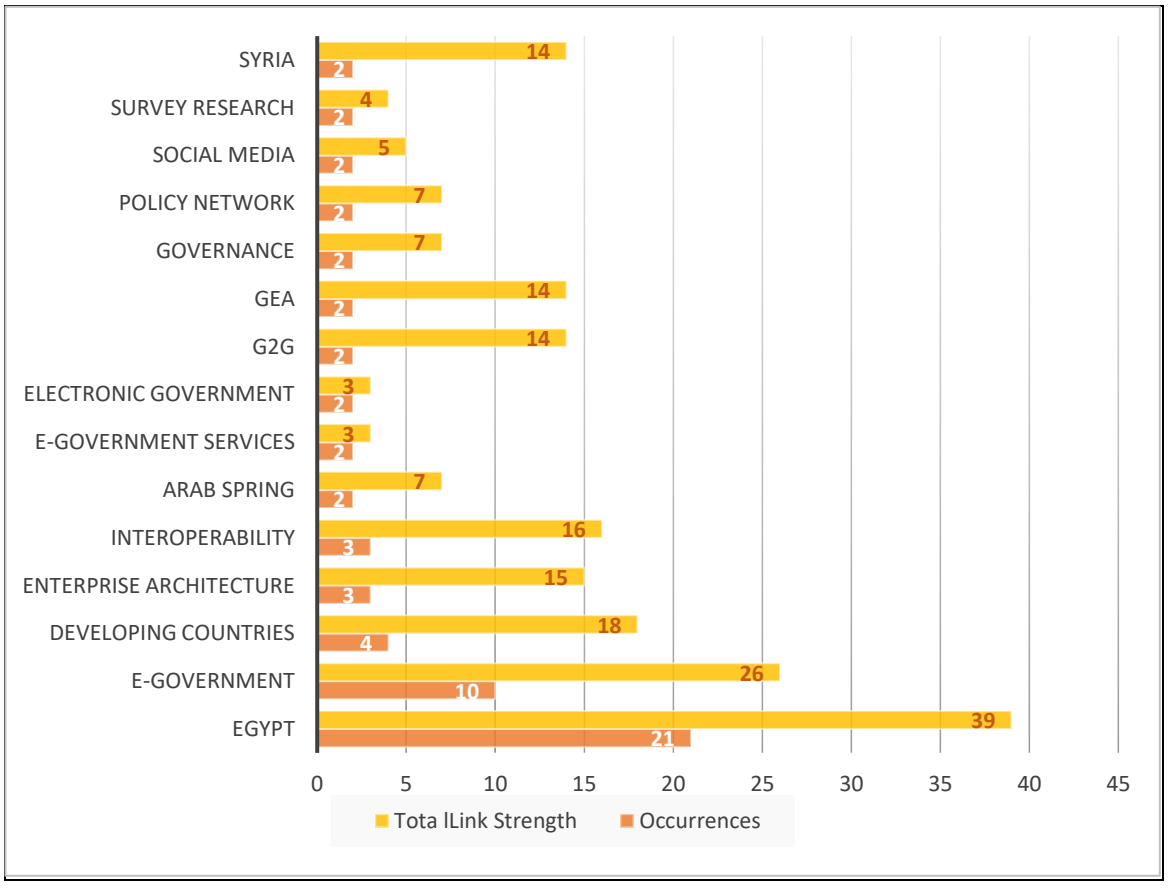

Figure 13: The (15) Keywords, Occurrences and its Total Link Strength (Drawn based on aggregated data from VOSviewer)

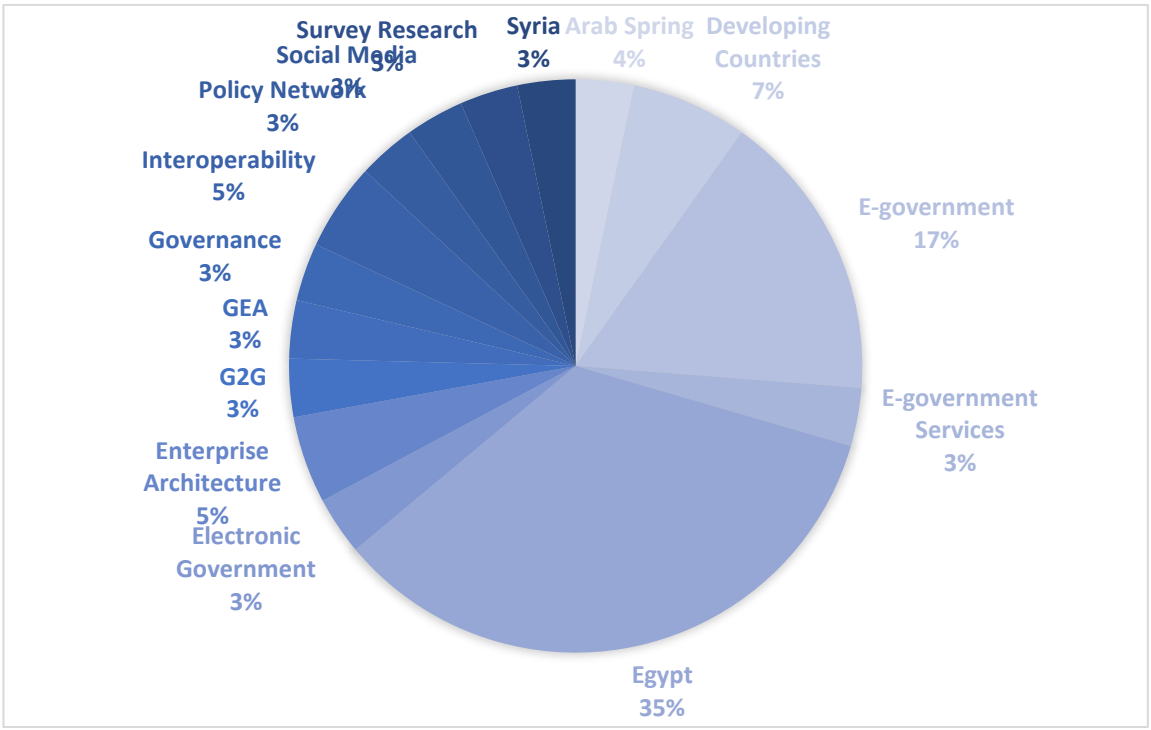

Figure 14: The (15) Keywords and their % of Total Links (Drawn based on aggregated data from VOSviewer)

Figures 15, 16, and 17 below display the visualisation of e-government (15 keywords with a minimum number of occurrences = 2), the network, overlay, and density with respect to the order.

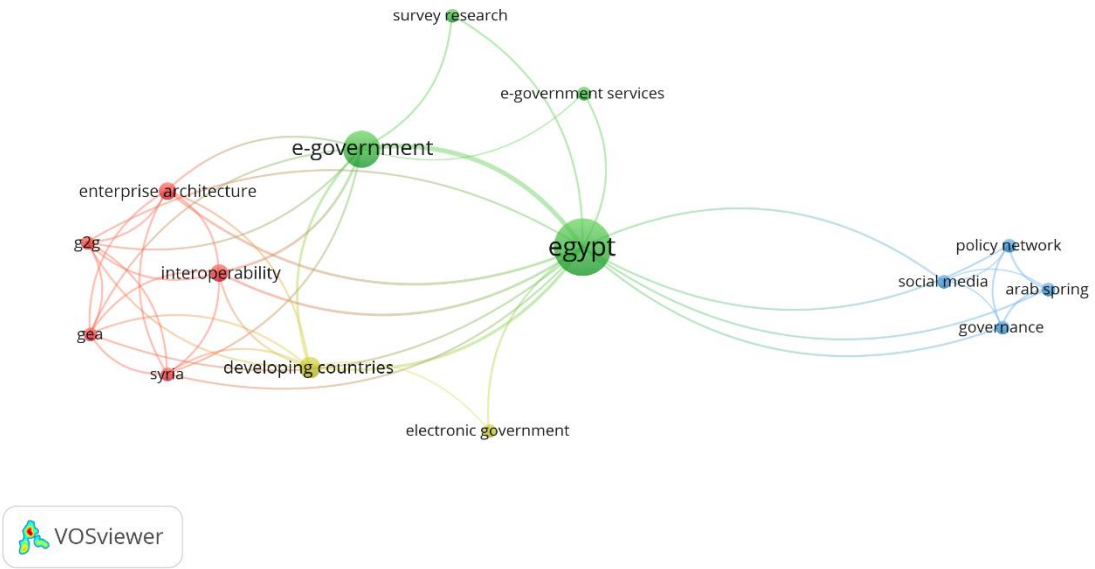

Figure 15: Network Visualisation E-government (15 Keywords with Minimum Number of Occurrences 2) Source: VOSviewer

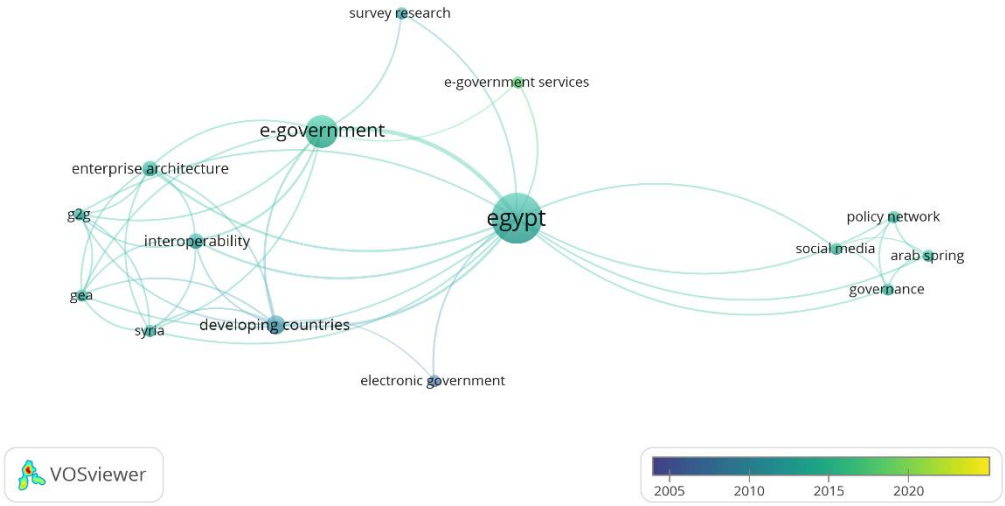

Figure 16: Overlay Visualisation E-government (15 Keywords with Minimum Number of Occurrences 2) Source: VOSviewer

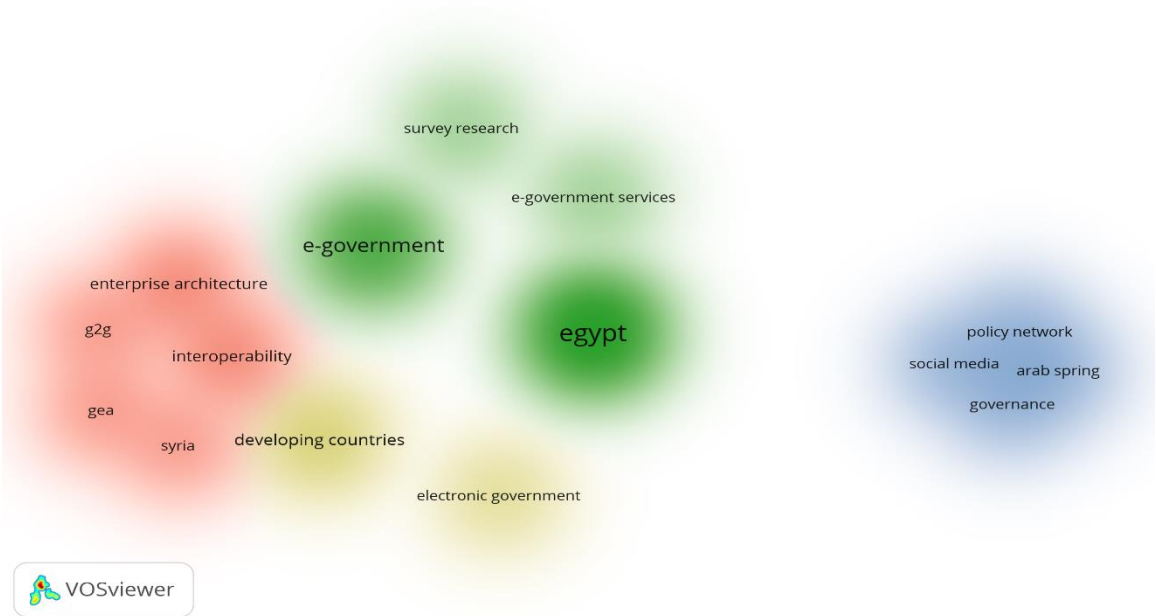

Figure 17: Density Visualisation E-government (15 Keywords with Minimum Number of Occurrences 2) Source: VOSviewer

Using the VOSviewer tool, the e-government authors' network, overlay and density were generated; see Figures 18, 19 and 20 below.

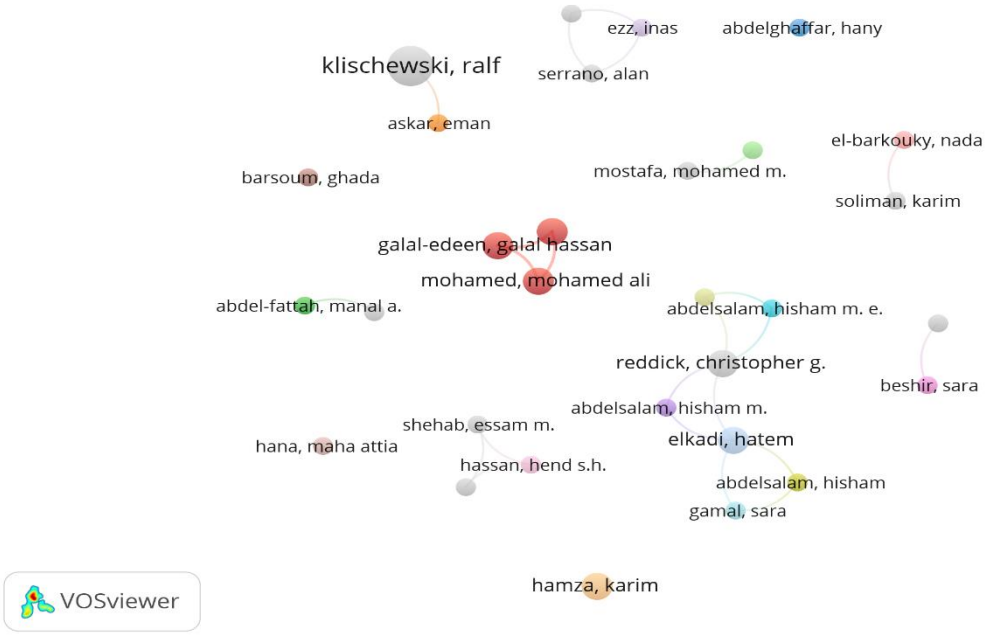

Figure 18: Network Visualisation E-government Authors Source: VOSviewer

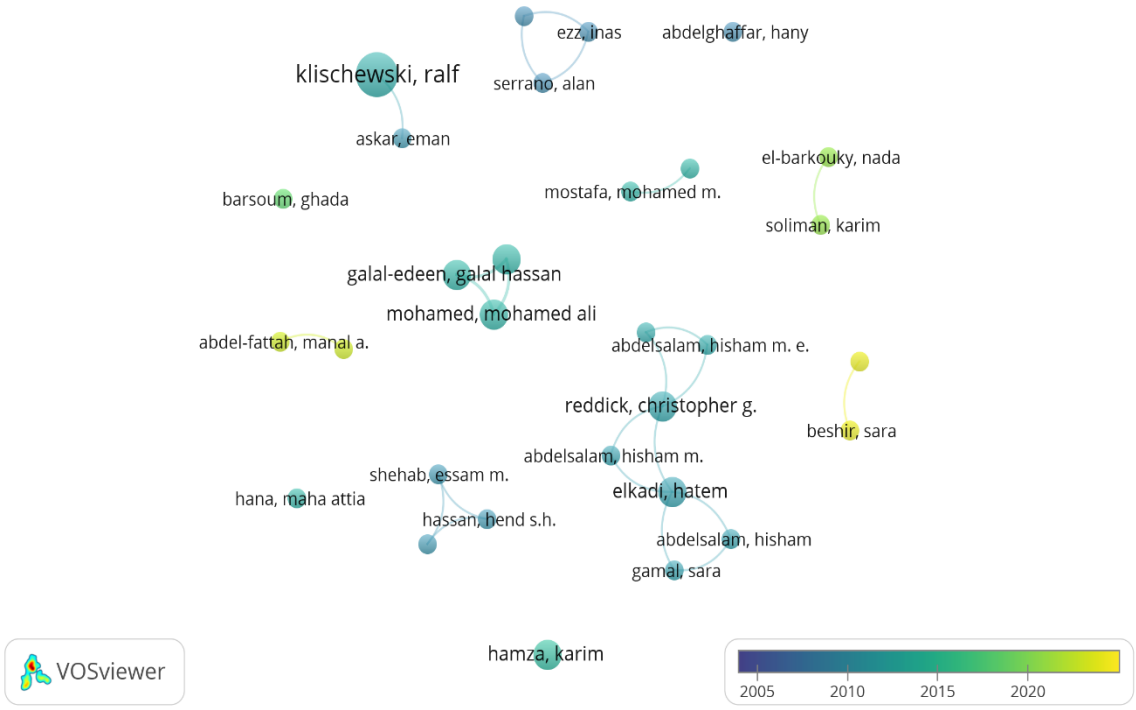

Figure 19: Overlay Visualisation E-government Authors Source: VOSviewer

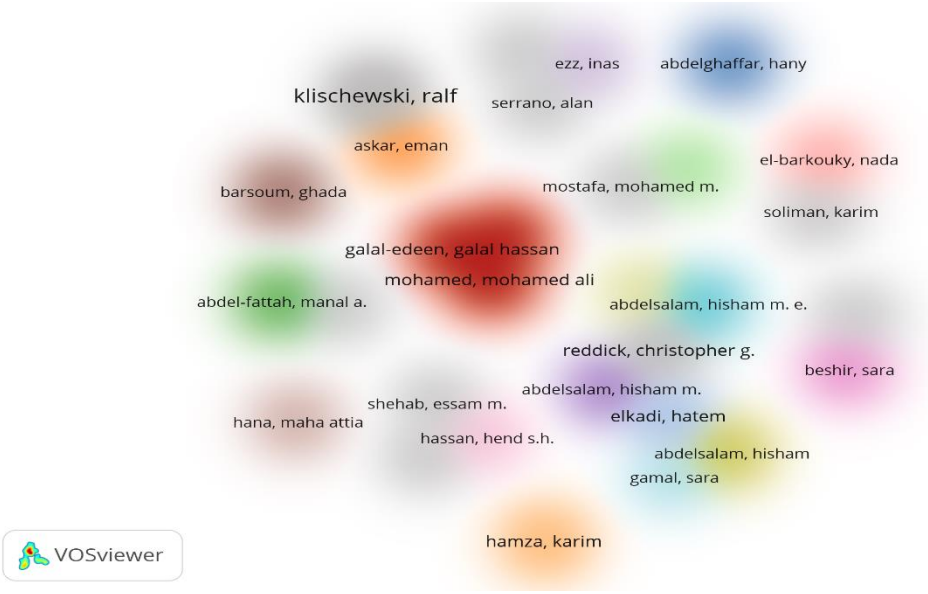

Figure 20: Density Visualisation E-government Authors Source: VOSviewer

Table 3 below contains the considered publications list (21), the year of publication, the author(s) ID(s), type (conference paper/article/book chapter), and number of author(s).

Table 3: the Considered Publications List

No	Year	Author(s) ID(s)	Type	#of Author(s)
1	2005	(56068241100)	Conference paper	1
2	2009	(54954701700)	Conference paper	1
3	2009	(14832668300); (6506379075); (55039826300)	Article	3
4	2010	(36806186700); (6507037138); (7003312778)	Article	3
5	2010	(55980041200); (57200222660)	Conference paper	2
6	2011	(12140363300); (36132977900); (57209471598)	Conference paper	3
7	2011	(55980041200)	Article	1
8	2011	(6602407068); (12140363300); (36132977900)	Article	3
9	2012	(6602407068); (12140363300); (36132977900)	Article	3
10	2012	(57693251700)	Conference paper	1
11	2013	(7102550252); (24365706500)	Article	2
12	2013	(55994540800)	Conference paper	1
13	2013	(57194028739); (14051997800); (57192163861)	Conference paper	3
14	2014	(56018225000)	Conference paper	1
15	2014	(55980041200)	Article	1
16	2014	(55980041200)	Conference paper	1
17	2014	(56018225000)	Conference paper	1
18	2018	(13007270500)	Article	1
19	2020	(56285704400); (57216956515)	Conference paper	2

No	Year	Author(s) ID(s)	Type	#of Author(s)
20	2022	(57449662800); (55545556200)	Article	2
21	2023	(55605527300); (57222614442)	Book chapter	2

5. Results

The common authors across multiple studies, based on the provided list. There are 5 unique active authors highlighted in the following Table 4; the table lists each author and the number of studies they participated in.

Table 4: Authors' ID(s) and Number of Publications (Aggregated data from query results)

Author ID	Number of Publications
55980041200	4
12140363300	3
36132977900	3
6602407068	2
56018225000	2
14051997800	1
57192163861	1
57194028739	1
56068241100	1
6506379075	1
6507037138	1
7003312778	1
7102550252	1
13007270500	1
14832668300	1
24365706500	1
36806186700	1
54954701700	1
55039826300	1
55545556200	1
55605527300	1
55994540800	1
56285704400	1
57200222660	1
57209471598	1
57222614442	1

Author ID	Number of Publications
57449662800	1
57693251700	1
572169565151	1

The shaded 4 authors showed in 9 out of 21 publications in total, performing (42.8%) from the years 2010 to 2014; these authors were particularly active in the field of e-government research in Egypt. They often collaborate with different colleagues across various research areas. Table 5 displayed these 5 authors and the year(s) of their publications.

Table 5: The 5 Authors and the Corresponding Year(s) of Their Publications

Author(s) ID(s)	Year
55980041200; 57200222660	2010
12140363300; 36132977900; 57209471598	2011
55980041200	2011
6602407068; 12140363300; 36132977900	2011
6602407068; 12140363300; 36132977900	2012
56018225000	2014
55980041200	2014
55980041200	2014
56018225000	2014

Grouping the current publications list is important, as each group includes a list of publications. The 21 publications have been included under their relevant theme and topic. Six groups were identified; here are each group and its covered topics.

1. **E-Government adoption and readiness: this group includes exploring readiness, frameworks, and citizen engagement in e-government systems, including cloud computing and gamification.**
2. **Digital divide and access: this group covers how access to digital platforms and services is distributed, with an emphasis on issues like the digital divide.**
3. **Government strategies, governance, and administrative changes: this group examines the influence of e-government on governance reforms, administrative practices, decision-making, and public administration transitions.**

4. **Technology implementation and challenges: this group focuses on barriers to e-government implementation and required strategies for success, including G2G services and local government maturity.**
5. **Social media, e-government, and social movements: this group investigates the intersection of social media, political change, and the Arab Spring's impact on governance and government-citizen relationships.**
6. **Sustainable development and innovation in e-government: this group focuses on sustainable development goals and how innovative approaches and sustainability align with the goals of e-government and can contribute to better e-government service delivery.**

The investigated publications were categorised based on the identified groups previously mentioned to create a matrix structure that shows the distribution of the published work each year in each research category – Table 6. This visualisation aids in addressing the year(s) with the high publication number and the category (ies) with high and low publication numbers as well. Thus, identifying the research gap in a simple, easy, understandable and summarised way.

Table 6: E-Government Research in Egypt – Identifying the Gap

	1.E-Government Adoption & Readiness	2. Digital Divide and Access	3. Government Strategies, Governance, and Administrative Changes	4. Technology Implementation and Challenges	5. Social Media, E-Government, and Social Movements	6. Sustainable Development and Innovation in E-Government	Total
2005	1 Kamel, 2005						1
2009	2 Abdelghaffar, 2009			3 Ezz, et al., 2009			2
2010			4 Hassan, et al., 2010	5 Klischewski & Askar, 2010			2
2011			6 Abdelsalam et al., 2011, 7 Klischewski, 2011,				3

	1.E-Government Adoption & Readiness	2. Digital Divide and Access	3. Government Strategies, Governance, and Administrative Changes	4. Technology Implementation and Challenges	5. Social Media, E-Government, and Social Movements	6. Sustainable Development and Innovation in E-Government	Total
			8 Reddick et al., 2011				
2012		9 Reddick et al. 2012		10 Azab, 2012			2
2013	12 Hana, 2013, 13 Mohamed et al. 2013			11 Mostafa & El-Masry, 2013			3
2014			14 Hamza, 2014a , 16 Klischewski, 2014b		15 Klischewski, 2014a, 17 Hamza, 2014b		4
2018				18 Barsoum, 2018			1
2020			19 Soliman & El-Barkouky, 2020				1
2022						20 Ibrahem & ABDEL-FATTAH, 2022	1
2023						21 Mostafa & Beshir, 2022	1
Total	4	1	7	5	2	2	21

The highest number of published studies belonged to government strategies, governance, and administrative changes; technology implementation and challenges; and e-government adoption and readiness categories, with 7, 5, and 4 publications, respectively; the remaining three categories have only 1 or 2 studies in each. That means these categories need more research conducted to fill the identified research gap. The years 2011, 2013, and 2014

have a high number of published works, with 3, 3, and 4, respectively, while other years have only 1 or 2 publications each year.

6. Discussion

E-Government adoption and readiness group papers' explore how different populations and governments are prepared for or adopting e-government services. The common topic between them is these papers examine the various facets of e-government adoption, focusing on citizen readiness, technology integration, and the necessary frameworks for implementing digital government systems in Egypt and developing countries.

Digital divide and access group papers' investigate issues such as the digital access of e-government services, how to improve the digital access to e-government websites, and the role. The common topic between them is these studies explore the impacting factors of the digital access of e-government services and how to evaluate the accessibility.

Government strategies, governance, and administrative changes group papers' investigate government strategies and the role of e-government in improving or changing administrative structures. The common topic between them is these studies explore how e-government influences public administration in Egypt, including decision-making processes, the challenges of reform, and the complexities of intergovernmental collaboration. The conclusion highlights the need for better governance frameworks to manage digital transformations.

Technology implementation and challenges group papers' focus on the technological aspects of implementing e-government services and overcoming the challenges involved. The common topic between them is these papers focus on the challenges of implementing e-government systems, from G2G services to local government websites and inter-organisational IT governance. The common theme is the need for effective planning, clear governance structures, and strategic processes for successful implementation.

Social media, e-government, and social movements' group papers' explore the interaction between social media and governance and how they affect public administration, especially in terms of social movements. The common topic between them is these publications explore the intersection of social media and political change, specifically focusing on how digital platforms have influenced governance and public movements during and after the Arab Spring, particularly in Egypt.

Sustainable development and innovation in E-government group papers' explore how e-government can contribute to achieving sustainable development goals and introduce innovative solutions. The common topic between them is these papers focus on using innovation, such as gamification, and aligning e-government services with sustainable development goals. They emphasise how digital tools can contribute to societal progress, particularly in promoting sustainability and improving service delivery.

The overall and general theme is e-government and its focus on improving website quality, where the core issue is the lack of a comprehensive and validated framework for evaluating e-government websites in Egypt. Although the investigation shows the existing preliminary frameworks, fragmented methods and the need for a strong solution through future research to develop and test a more effective framework.

This emphasises the research gap and the need for future research efforts to address it, ultimately leading to improved e-government website quality in Egypt. Consider that the website should be useful for the government, easy for citizens to use, and visually appealing. A complete, clear, and tested plan that covers all the important aspects of a good e-government website, like security, accessibility, information accuracy, and user feedback, should be developed.

The future research's main topic should consider the identified critical areas of research, building upon the insights from the existing studies. The topics varied between directly addressed topics from previous research gaps (i.e., developing a validated evaluation framework and exploring the impact of social and cultural factors), measuring the maturity level of e-government

and local governments' websites, and indirect – associated extends to focusing on other purely technical issues that have to be considered.

M-government in Egypt and associated technologies are still potential future research areas; a required investigation and assessment of the opportunities and barriers of delivering government more services through mobile devices. This topic is aligned with the digital divide and accessibility area; it recognises the needed area to address the digital divide and ensure accessibility for all citizens.

7. Conclusions

To sum up, the key topics across the investigated studies were dedicated to the following areas: All studies focus on the Egyptian context, examining e-government initiatives and challenges in the country. Citizen Engagement and Participation: Most e- government studies emphasise the significance of citizen engagement and participation. This includes ensuring accessibility and providing citizen-centric services. The shared interest is identified in improving e-government services delivery, whether through mobile, social networks, or local government websites. In addition, analysing the development of e-government in Egyptian local governments, focusing on website maturity levels. Utilising content analysis to assess the maturity of local government websites in terms of e-management, e-services, and e-decision-making. Moreover, investigating the link between factors of human development and maturity of e-government websites.

Achieving the target level of success in projects with an e-government services focus is not an easy or short-term mission. This required a well-developed plan that considered the existing and potential challenges, associated risks and its assessments and associated plans and scenarios. An accumulated and sustainable success level is a formula of different key factors, such as cooperation and integration between all participants in considering all related challenges and applying best practices, good management, and experiences in dealing with critical situations as well.

Having the goal of a smooth and reliable e-government website experience for citizens. The research gap is represented as the need for a comprehensive

evaluation framework. This highlighted the need for research to develop and test such assessment tools, leading to improved e-government website quality in Egypt. The investigated publications were categorised based on the identified groups; the developed matrix reflects the number of publications each year distributed to the research groups and areas. This makes the research gap more easily reached and understandable.

The carried out analysis shows how the various studies contribute to the understanding of e-government in Egypt but also highlights the limited number of studies concerning e-government and the lack of studies in some significant areas, such as the development of a completed and validated framework for website evaluation. This positions the research gap as a crucial next step, suggesting specific directions for the future.

Based on the above-comprehensive analysis and details, the identified potential research gaps and future directions of research related to e-government in Egypt include but are not restricted to the following areas:

1. E-government adoption and readiness
2. Digital divide and access
3. Government strategies, governance, and administrative changes
4. Technology implementation and challenges
5. Social media, e-government, and social movements
6. Sustainable development and innovation in e-government

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