

DOI: https://doi.org/10.48009/2_iis_2024_114

E-Government studies in the Arab world: preliminary results from a review of the literature

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Abstract

This paper presents the preliminary findings of a systematic literature review (SLR) on e-government studies in Arab countries. We identified publication trends, theoretical frameworks and constructs used, and research methodologies in e-government research across 22 Arab nations. The study highlights the increasing interest in e-government systems, driven by significant digital transformation initiatives in the region. Our analysis shows a reliance on intention-based theories such as the UTAUT and TAM, with a predominant use of survey methods. We emphasize the need for Arab researchers to adopt rigorous scientific methods and explore the unique contextual factors of the region. While the results align with previous SLRs, they underscore the importance of moving beyond individual-level analyses to examine institutional and national impacts. Our findings call for more nuanced research to support effective e-government implementation and policy development in the region.

Keywords: e-government, systematic literature review, arab countries, digital transformation, theoretical frameworks, research methodologies.

Introduction

Electronic government (e-government) refers to public institutions' use of information technologies to enhance interactions with businesses, citizens, and other government entities (Mirkovski et al. 2023; Rouibah et al. 2022). E-government aims to improve administrative efficiency, public service delivery, trust in government, open government capabilities, social value, well-being, ethical behavior, and professionalism (Rouibah et al. 2022)

The primary objectives of this research are to examine e-government in the Arab region for three main reasons:

First, despite the large population of the Arab world, which was 335,827,330 in 2008 and 448,585,874 in 2024 and increase number of internet users (Table 1 from <https://www.internetworldstats.com/>), there has been relatively less research on e-government in the Arab world in comparison to North America and Europe.

Second, Arab countries are undergoing significant digital transformation initiatives, with the digital transformation industry in this region projected to be worth \$55 billion in 2024 and \$418.54 billion by 2034 (Future Market Insight 2024). This transformation aligns with global trends, where spending on digital

transformation technologies and services is expected to reach \$3.9 trillion by 2027 (Statista 2024). Despite these investments, numerous studies have highlighted challenges in e-government implementation in less developed countries (Alryalat et al. 2023) and Arab nations (Makki and Alqahtani 2022; Zeebaree et al. 2020), including low usage levels (Harfouche 2010; Rouibah et al. 2022; Rouibah et al. 2018). This is perplexing given the popularity of online social networks, e-commerce, and e-banking in these regions, suggesting a unique reluctance to adopt e-government services (Rouibah et al. 2022).

Third, the need for a focused study on e-government in the Arab world is underscored by the fact that while several systematic literature reviews (SLRs) exist on e-government (Alzahrani et al. 2017; Jonathan and Rusu 2019; Mirkovski et al. 2023), there is a notable lack of SLRs focusing specifically on this region. This region comprises 22 Arab nations spanning 13,806,212 square kilometers, with a population of 448,585,874 and 239,930,572 internet users as of 2023.

This research addresses this gap by providing a comprehensive analysis of e-government studies in Arab countries. Our study aims to identify the unique challenges and opportunities within this context, offering insights into areas that have been underexplored and highlighting issues that warrant future attention in order to help Arab researchers publish in high quality journals.

Table 1. Arab countries, population size and number of Internet users between 2008 and 2024 (Internet World Stats 2008 and 2024; (Rouibah & Hamdy, 2009))

Country	Country area (sq km)	Population (2008)	Population (2023)	Number of Internet users (2008)	Internet penetration (2000/2008)	Number of Internet users (2023)	Internet penetration (2000/2023)
Algeria	2,381,741	33,333,216	45,150,879	2,460,000	7.4	37,836,42	50,756
Bahrain	694	738,874	1,804,583	157,300	21.3	1,804,583	100.0
Comoros	1,862	711,417	900,222	21,000	3.0	228,800	25.4
Djibouti	23,200	496,374	1,011,573	11,000	2.2	548832	54.3
Egypt	1,001,450	80,335,036	105,530,371	6,000,000	7.5	54,741,493	51.9
Iraq	434,128	27,162,627	41,752,172	6,000	0.1	31,027,400	74.3
Jordan	89,342	5,375,307	10,370,272	796,900	14.8	8,700,000	83.9
Kuwait	17,818	2,730,603	4,375,865	816,700	29.9	4,332,106	99.0
Lebanon	10,201	4,556,561	6,776,509	950,000	20.8	5,692,267	84.0
Libya	1,777,060	6,036,914	7,024,811	232,000	3.8	6,658,900	94.8
Mauritania	1,035,000	3,270,065	4,775,119	30,000	0.9	969,519	20.3
Morocco	458,730	33,757,175	37,344,795	6,100,000	18.1	25,589,581	68.5
Oman	309,500	2,452,234	5,328,207	319,200	13.0	5,061,797	95.0
Palestine	6,242	3,070,228	5,302,778	266,000	8.7	3,977,083	75.0
Qatar	11,521	824,355	2,962,541	289,900	35.2	3,179,400	107.3
Saudi Arabia	2,149,690	24,069,943	35,719,422	4,700,000	19.5	35,005,034	98.0
Somalia	637,657	12,448,179	16,359,504	94,000	0.8	2,089,900	12.8
Sudan	2,505,810	39,379,358	44,909,353	3,500,000	8.9	13,124,100	29.2
Syria	185,180	19,514,386	18,224,180	1,500,000	7.7	8,500,000	46.6
Tunisia	163,610	10,276,158	11,935,766	1,618,440	15.7	8,170,000	68.4
UAE	77,700	3,981,978	10,088,517	1,708,500	42.9	12,176,400	120.7
Yemen	528,076	21,306,342	30,938,435	270,000	1.3	8,353,377	27.0
Total	13,806,212	335,827,330	448,585,874	31,846,940	-	239,930,572	

Our SLR seeks to answer the following four research questions regarding e-government adoption in the Arab world:

RQ1: *What are the publication trends on e-government systems in Arab countries from 2007 to 2024?*

RQ2: *In which journals did Arab researchers publish their e-government studies? And what is the quality rating of these journals according to the JCR report of the Web of Science?*

RQ3: *Which theoretical frameworks and constructs are most commonly used in e-government studies in Arab countries?*

RQ4: *How do “research designs and sample” populations in these studies enhance our understanding of e-government adoption and impact?*

This SLR, still in progress, presents our preliminary findings and aims to explore the unique aspects of e-government in the Arab world. The following section details the methodology employed in this SLR.

Methodology

In conducting our SLR, we adhered to the guidelines outlined by Agarwal et al. (2017) and followed a rigorous search protocol. The SLR methodology involves a systematic approach to reviewing literature, encompassing various activities. Specifically, the process includes three main activities (

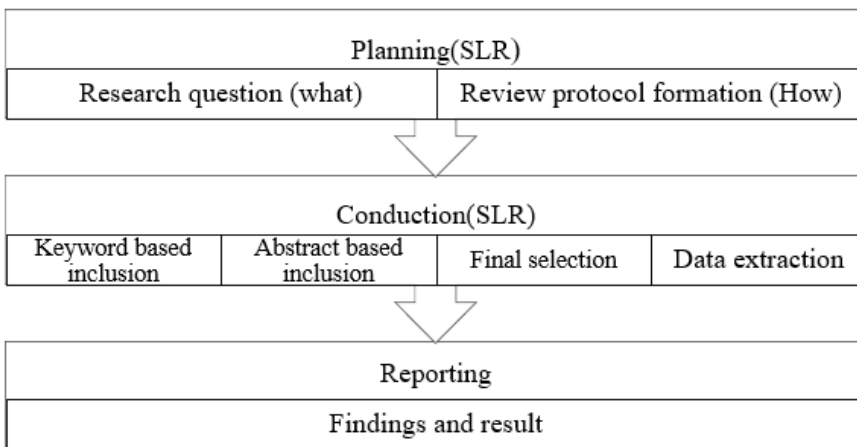


Figure 1): planning, conducting, and reporting, as illustrated in Figure 1. We followed the framework established by Palvia et al. (2017) to guide our method, which allowed us to identify methodological and topic trends in e-government research.

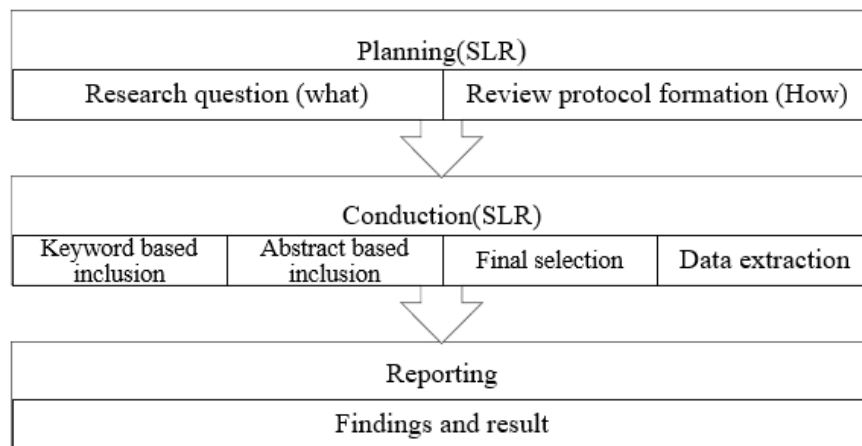


Figure 1: SLR Phases

The planning phase describes how to plan for conducting SLR and includes two steps: (i) Identify the research questions, (ii) and create and review the protocol for conducting the SLR. We conducted our article search using the Scopus database given its comprehensiveness. We used the following keywords to identify the research articles for the SLR: “electronic government”, “e-government”, “eGovernment”, “mobile government”, “m-government”, “digital government” and “online government” using the logical “And” or “OR” operator supported with other sets of keywords including “adoption”, “intention”, “behavior”, “acceptance” and list of 22 Arab countries in context for which the available literature have been considered for this study including “Algeria”, “Bahrain”, “Comoros”, “Djibouti”, “Egypt”, “Iraq”, “Jordan”, “Kuwait”, “Lebanon”, “Libya”, “Mauritania”, “Morocco”, “Oman”, “Palestine”, “Qatar”, “Saudi Arabia”, “Somalia”, “Sudan”, “Syria”, “Tunisia”, “United Arab Emirates” and “Yemen”. The search resulted in a total of 459 articles.

Under the supervision of one of the authors of this paper, two research assistants were given the following criteria to filter through the articles. The inclusion criteria included: (i) published online in English between January 2007 and April 15, 2024, (ii) published in a peer-reviewed journal, (iii) available in full text, (iv) empirical research, and (v) describing the intention to use, use, or post-adoption use of e-government in one of the 22 Arab countries. Studies were excluded if they met any of the following criteria: (i) conference papers, theses, or non-peer-reviewed scientific papers, (ii) research involving information systems not specifically for e-government adoption, such as cloud or security, or (iii) focused on the design or evaluation of e-government systems.

Applying this procedure allowed us to exclude 198 papers for not meeting the inclusion criteria: 3 non-English papers, 141 conference papers, 44 book chapters, 2 books, and 8 review papers. We then performed a quality assessment on the remaining 261 articles by reading their abstracts. This assessment evaluated each article based on its relevance to e-government adoption, its alignment with our research questions, and the applicability of its methods and data analyses.

To ensure judgment reliability, the two researchers who initially retrieved the papers conducted an additional analysis, resulting in the removal of 168 articles that did not meet our quality criteria. This left 93 full-text articles for in-depth reading. Further evaluation led to the removal of 29 more articles, resulting in 64 relevant papers included in this SLR study. Our SLR article selection procedure is summarized in Figure 2.

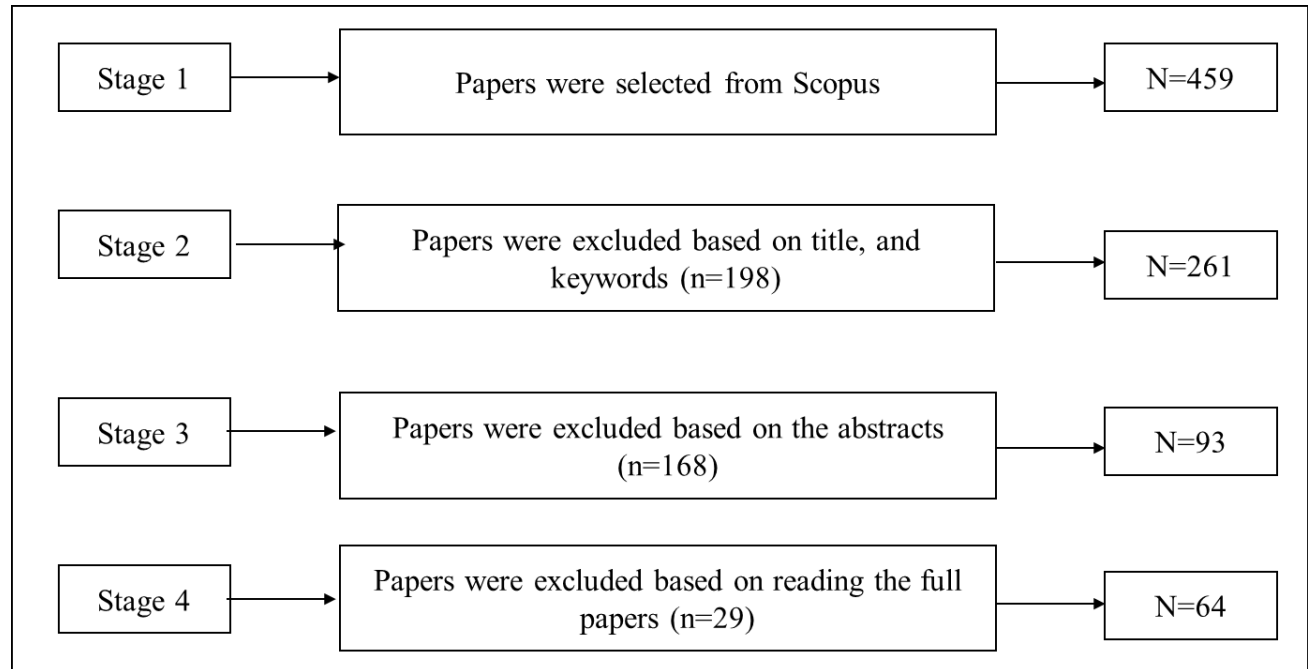


Figure 2: SLR article selection procedure

We analyzed and extracted relevant information from the 64 retained studies based on the following criteria (with the exception that we did not incorporate information on surveyed studies due to space limitations. The information can be made available upon request).:

(i) authors, (ii) theories/frameworks used, (iii) model constructs, (iv) research approach (qualitative, quantitative, mixed methods), (v) country of study, (vi) study design, (vii) sample type (university students, faculty members, employees), (viii) research setting (society, university, organization), (ix) sampling procedure (convenience, random sampling), statistical analysis methods, publication outlets, (xii) journal quality, and (xiii) significance of paths among constructs.

Results

Answer to RQ1: Publication Trends on e-Government Systems in Arab Countries

Figure 3 illustrates the publication trend on e-government adoption systems from 2007 to 2024. The data shows that Arab researchers began publishing e-government studies in 2007, with no publications in 2008 and 2014. The publication trend has gradually increased with some variation, peaking in 2023 with 10 publications, followed by 2022 with 8 publications, and 2013 with 7 publications. The increasing trend suggests growing interest due to digital transformation efforts across the region.

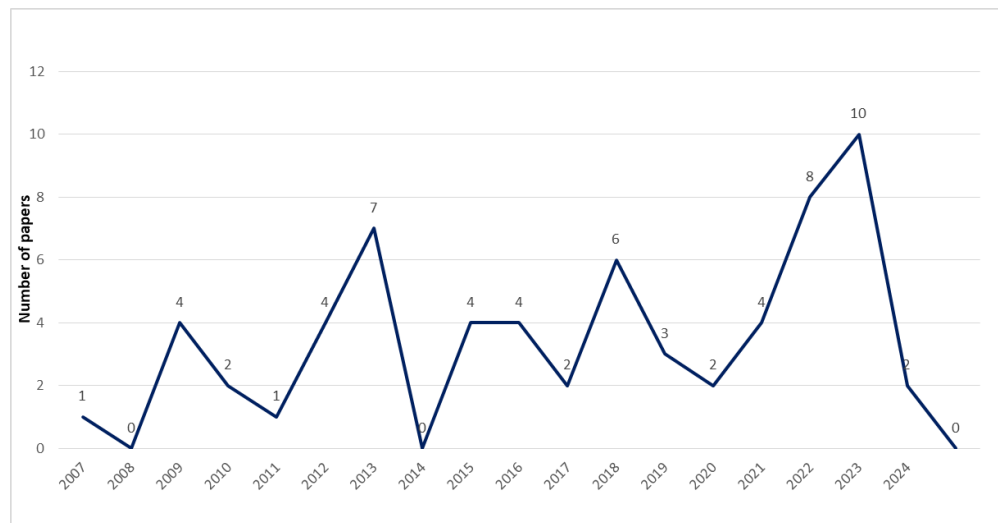


Figure 3: Publication Trend

Table 2 summarizes the number of Arab studies by country and region. Jordan leads with 19 publications, followed by Saudi Arabia (13), UAE (11), Kuwait (7), Iraq (5), and Oman (4). Lebanon, Egypt, and Algeria each have 3 publications, Tunisia, Qatar, and Bahrain have 2 each, while Morocco, Palestine, Sudan, Syria, and Yemen each have one. The remaining countries (Comoros, Djibouti, Libya, Mauritania, and Somalia) have no publications. Regionally, the GCC countries (Bahrain, Qatar, Oman, Kuwait, UAE, and Saudi Arabia) are the most productive with 39 publications, followed by non-GCC countries (Palestine, Syria, Yemen, Lebanon, Iraq, and Jordan) with 30, and North African Arab countries (Morocco, Sudan, Tunisia, Algeria, and Egypt) with 10 publications.

Table 2: Articles by Country and Region

Article per Region	Region	Country	Article per Country
39	Gulf Cooperation Council (GCC) Countries	Saudi Arabia	13
		UAE	11
		Kuwait	7
		Oman	4
		Qatar	2
		Bahrain	2
11	Arab countries in Asia & not GCC	Jordan	19
		Iraq	5
		Lebanon	3
		Yemen	1
		Syria	1
		Palestine	1
10	Arab countries in Africa	Egypt	3
		Algeria	3
		Tunisia	2
		Sudan	1
		Morocco	1
		Comoros	0
		Djibouti	0
		Libya	0
		Mauritania	0
		Somalia	0

Answer to RQ2: journals where Arab researchers publish their studies and their rating

In term of distribution of e-government adoption publications by journal, the most popular outlets for e-government studies focusing on Arab countries (Table 3) are Transforming Government: People, Process and Policy (9 publications), International Journal of Electronic Government Research (6), Information Technology & People (4), and International Journal of Information Management (3). Six journals each have 2 publications: Journal of Internet Commerce, Journal of Global Information Management, International Journal of Technology and Human Interaction, Information Technology for Development, Government Information Quarterly, and Electronic Government, an International Journal.

Table 3: Publication Journal and quality rating based on JCR

Journal publication title	N	Ranked JCR
Transforming Government: People, Process and Policy	9	NRJ [JCR but not ranked]
International Journal of Electronic Government Research	6	NRJ [JCR but not ranked]
Information Technology & People	4	Q2
International Journal of Information Management	3	Q1
Electronic Government, an International Journal	2	NRJ

Journal publication title	N	Ranked JCR
Government Information Quarterly	2	Q1
Information Technology for Development	2	Q2
International Journal of Technology and Human Interaction	2	NRJ
Journal of Global Information Management	2	Q2
Journal of Internet Commerce	2	NRJ
Applied Computing and Informatics	1	NRJ
Australasian Journal of Information Systems	1	NRJ
Cogent Business & Management	1	NRJ [JCR but not ranked]
Computer Modeling in Engineering & Sciences	1	Q3
Computers in Human Behavior	1	Q1
Digital Policy, Regulation and Governance	1	NRJ [JCR but not ranked]
Education, Business and Society: Contemporary Middle Eastern Issues	1	NRJ
Egyptian Informatics Journal	1	Q3
Emerging Markets Case Studies	1	NRJ
EuroMed Journal of Business	1	NRJ [JCR but not ranked]
Global Knowledge, Memory and Communication	1	NRJ [JCR but not ranked]
IEEE Access	1	Q2
Information Polity	1	NRJ [JCR but not ranked]
International Journal of Business Information Systems	1	NRJ
International Journal of Customer Relationship Marketing and Management	1	NRJ
International Journal of Data and Network Science	1	NRJ
International Journal of Electrical and Computer Engineering	1	NRJ
International Journal of Information Systems and Social Change	1	NRJ
International Journal of Information Systems in the Service Sector	1	NRJ [JCR but not ranked]
International Journal of Public Administration	1	NRJ
International Journal of Public Administration in the Digital Age	1	NRJ [JCR but not ranked]
International Journal of Public Sector Management	1	NRJ
Journal of Software	1	NRJ
Journal of Internet Technology	1	Q4
Journal of Knowledge Management	1	Q1
Journal of System and Management Sciences	1	NRJ
Periodicals of Engineering and Natural Sciences	1	NRJ
Social Science Computer Review	1	Q2
Social Sciences	1	NRJ [JCR but not ranked]
Sustainability	1	Q2

Figure 4 illustrates the quality ratings of the journals where these studies were published. Most articles, 67.19% (n=41) are published in journals indexed in JCR by Web of Science, with 32.81% (n=21) in non-ranked journals. Of the JCR-indexed articles, 10.91% (n=7) are in high-quality Q1 journals, 17.19% (n=11) in Q2 journals, 3.13% (n=2) in Q3 journals, and 1.56% (n=1) in Q4 journals. Additionally, 34.38% (n=22) of the articles are published in JCR for the first time but are not yet ranked.

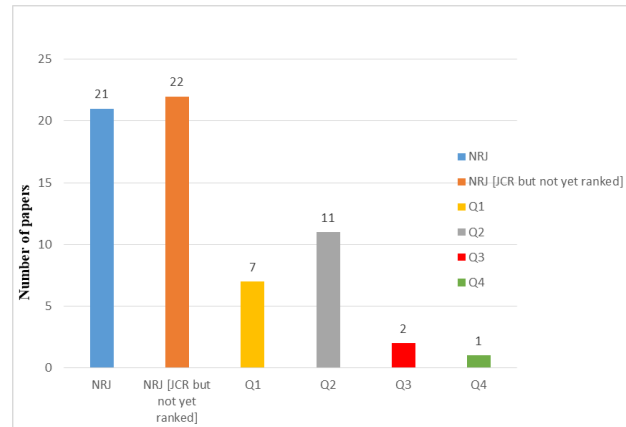


Figure 4: Study Journal Rank Distribution

Answer to RQ3: Theoretical Frameworks and constructs

In this section, we present our preliminary analysis of the trends in theories, constructs, and data samples used in the reviewed literature. We limit our analysis to studies in our sample where we can extract such information. Therefore, we include only studies with an empirical quantitative component. Out of the 64 studies in our sample, only 48 papers meet this criterion and are used for the analysis in this section

Table 4 provides a summary of the theories used in our sample. In total, 14 theories were used in 46 Studies, with two studies performing correlational analysis with no clear theoretical bases. Intention-based theories emerged from the Theory of Reasoned Action (Fishbein and Ajzen 1977) namely TRA, TPB, TAM and its variants, and UTAUT. These theories were used 33 times across the sample, suggesting that the focus in e-government studies in the region is mostly on acceptance and intention to use suggesting the existence of user resistance to e-government initiatives. Following these intention-based theories is the IS Success model (DeLone and McLean 2003). The prevalent use of this theory suggests a need to understand the impact of e-government initiatives and to justify their investments. The limited focus on the continuation of use and adaptation or infusion of e-government technologies suggests that countries in the region are still at the early stages of the diffusion of such an innovation (Rogers et al. 2014).

Another indicator that e-government studies in the Arab region are at an early stage is that 31 studies employ a single theoretical framework and 2 employ correlational analysis with no theoretical base. The practice suggests that most researchers are focusing more on understanding the idiosyncrasies of the Arab countries' context rather than extending or combining theories. A single study attempts to combine the findings from 5 theoretical frameworks (Abdelhakim and Idoughi 2021), while the remaining 16 studies attempt to combine 2 theories.

Table 4: Theories used in SLR sample

No	Theory	Count
1	TAM, TAM2, TRA, and TPB	17
2	UTAUT	16
3	IS Success Model	13
4	Diffusion of Innovation	3
No	Theory	No

5	Trust Theory	3
6	Hofstede's Cultural Model	2
7	Institutional Theory	2
8	Expectation-Confirmation Model	2
9	No Theory	2
10	Perceived Characteristic of Innovation	1
11	Social Cognitive Theory	1
12	Basic Personal Values	1
13	Administrative Management Theory	1
14	Information Quality Benefits and Performance	1
15	Knowledge Management Theory	1

As for the used constructs, we focus first on the dependent variables used in the SLR sample. Table 5 shows the most common dependent variables appearing in at least three studies (n=10). Another 26 dependent variables appear in 2 or less studies. Consistent with theoretical frameworks, behavioral intention is the most studied dependent variable with most constructs relating to the intention-based theories.

Two notable observations can be made from the table. First, while we have observed the information success model is used prevalently in our sample, ranked third in term of frequency used theory (n=13), the studied impact is limited to individual impact, mainly that of satisfaction and trust in e-government systems. Studies focusing on the institutional and country-wide impact of e-government systems are non-existent. Second, the appearance of ease of use as a dependent variable in 7 studies, e.g. see (Ahmad and Campbell 2015; Al-Gahtani 2011), was intriguing. Upon further investigation, it was mostly investigated as a mediating variable to quality and design, which is logical. However, other variables were proposed as antecedents that lacked face validity and no logical argument was provided as to how it shapes ease of use. The first is perceived usefulness (Ahmad and Campbell 2015) and the other is trust (Al-Gahtani 2011).

Even in the case of studies that exhibited face validity in the proposed antecedents to ease of use, the narrative lacked theoretical arguments and relied only on citing prior literature for support, which itself is not theorizing (Sutton and Staw 1995). Without proper theorizing, there is likely to be an endless stream of studies that study correlations between variables without contributing to our understanding of the causal mechanisms at work that would be important to craft effective policies and interventions.

Table 5. Construts used in SLR sample

No	Dependent Variable	Count
1	Behavioral Intention	23
2	Satisfaction	12
3	Usefulness	9
4	Trust in e-government	9
5	Ease of use	7
6	E-government usage	6
7	E-government adoption	4
No	Dependent Variable	Count

8	Attitude	4
9	Risk	4
10	Performance expectancy	3
11	DVs appearing in less than 3 studies	26

Answer to RQ4: Study design and sampling methods

With regards to research designs, researchers employ quantitative studies (n =52), only three used a quatitative study (Al-Emadi & Anouze, 2018; AlAwadhi & Morris, 2009; Zhao et al., 2012), only two investigate e-government through secondary data (Al Nagi & Hamdan, 2009; Chatfield & Al-Hujran, 2009), and two were case studies about Egypt (Elkadi 2013) and UAE (Abu Ghazaleh and Zamberi Ahmad 2018), while one study made a systematic literature review and developed a conceptual model without testing it (Alryalat et al. 2012) while another developed only a conceptual model without also testing it (Aladwani 2016)

Of the 48 empirical studies in our SLR sample, 29 obtained data by surveying random citizens, 8 surveyed government employees, 2 surveyed university employees only, 6 surveyed university students only, and 2 surveyed both students and university employees. The focus on citizen samples is consistent and appropriate for acceptance studies. However, the increasing number of studies sampling government employees is encouraging, signaling a shift towards understanding the institutional impact and success factors of e-government systems, which marks an improvement in the quality of research conducted in the region. While university and student samples are considered part of the general citizenry, their selection is often driven by convenience, which may introduce biases. Future studies should aim to justify the use of such samples or, preferably, seek more diverse and representative populations. This could involve incorporating various demographics, such as different age groups, socio-economic statuses, and geographic locations, residents and citizens in order gain a holistic understanding of e-government adoption.

The methodological strengths and weaknesses of the current sampling methods are noteworthy. Random sampling offers greater reliability and validity, while convenience sampling ease access to participant, they however lead to potential biases. To advance the field, researchers should consider employing more robust sampling techniques and expanding their sample sizes to enhance the generalizability of their findings.

Discussion

This paper presents the preliminary results of our systematic literature review (SLR) on e-government studies in 22 Arab countries. While numerous SLRs have addressed e-government, few have focused specifically on the Arab context. Alzahrani et al. (2017) examined trust antecedents in e-government adoption from 2000 to 2014. Our study extends this timeframe to 2024 and narrows the focus to Arab countries. Although our initial findings align with those of Alzahrani et al. (2017), they underscore the need for regional researchers to build on established knowledge with rigorous methodologies that explore the distinctive aspects of the Arab context. Mere correlational studies will likely add little knowledge to the existing global understanding of e-government.

Similarly, Jonathan and Rusu (2019) highlighted the methodological limitations in e-government research, noting a heavy reliance on surveys. Our review confirms this pattern, suggesting convenience as a possible reason. To progress, researchers in the Arab region should focus on impact studies that transcend individual acceptance and consider institutional and national outcomes. Such studies, preferably econometric, could provide valuable policy insights. Mirkovski et al. (2023) explored the cross-country reuse of e-government

systems, offering a perspective highly relevant to the Arab world. Despite minimal overlap with our findings, their work presents an opportunity for regional researchers to delve deeper into success factors pertinent to their context.

It is essential to emphasize that our findings are preliminary. Limited to the Scopus database, they may not fully represent the e-government studies in Arab countries. Further, we have not yet conducted a detailed analysis of the relationships studied, which could offer additional insights. Our assessment of sample populations, while informative, does not provide a complete contextual picture. Future research will expand on this work, offering a more holistic view of e-government studies in Arab countries.

In conclusion, preliminary findings provide valuable perspectives and emphasize the importance of further Arab research to undertake thorough investigations in order to tackle the distinct challenges and opportunities of e-government in the Arab world. Following Rouibah et al. (2022) it is crucial to employ mixed research methods to shed light on the distinctive characteristics of the context and justify the utilization of theory and its constructs. Future studies should strive to deepen our understanding and support the effective implementation of e-government systems in this region, thereby enhancing public administration and service delivery

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