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A Systematic Literature Review of Factors Influencing the Adoption of GRP Systems

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Abstract

Because of the enhanced efficiency and value that come with implementing ERP systems and e-government, these systems have taken center stage in government organizations throughout both developed and develop-ing nations. To provide more efficient government and better services to citizens, public administrations and agencies have invested in Enterprise Resource Planning (ERP) systems as their core technological infrastruc-ture for e-government. Despite recognizing the importance of management information systems in electronic government, most Arab countries in the Middle East and other underdeveloped countries are still dealing with issues with adopting these technologies. This study introduced a Systematic Literature Review (SLR) to identify the Critical Success Factors influencing the adoption of GRP systems, the benefits of GRP sys-tems, and their challenges. Studies from 2015 to 2024 were selected from databases such as Scopus and IEEE Explore. This study proposed a conceptual model based on technological, organizational, and envi-ronmental factors. The study also analyzes the importance of the CSFs. It also summarized the most signifi-cant challenges and difficulties in adopting GRP systems, as well as future trends, thereby creating numer-ous opportunities to develop various solutions.

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1. INTRODUCTION

The adoption of e-government systems is a strategic priority for nations seeking to enhance public service delivery and administrative efficiency [1]. Since the early days of professional IT use, organizations have worked to increase their returns on IT investments, and numerous study groups such as software economics and value-based software engineering have been looking for strategies to maximize the return on IT investments [2].

Many developing countries are attempting to adopt e-government. In underdeveloped nations, e-government offers opportunities to enhance citizen services and to help governments achieve good governance. An ERP system was created to address this demand. A single view of the data and information organization as part of a unified technological framework in e-government is provided by ERP software, which integrates and unifies all business processes of various roles [3]. By integrating, standardizing, and simplifying numerous company transactions, enterprise resource planning (ERP) solutions improve output and working conditions [4].

ERP systems and e-government are important initiatives to boost productivity, which will have a significant impact on an organization's success in the future [5]. They also promise to reduce access to information, enhance various administrative functions, and enable communication between them. The majority of public organizations are expected to deliver high-quality performance, but their aims and objectives differ from those of private sector businesses, and these are two of the many factors that need to be considered [3].

Since Enterprise Resource Planning (ERP) systems are designed to provide smooth business process integration, increased interoperability between the organization's systems, improved workflow between business functions, standardized business practices, improved order management, and improved customer service, e-

government has brought up operational, functional, and strategic issues regarding the transformation of public organizations and their adoption of new technologies [6]. Information systems are essential to an organization's operations because they provide managers the necessary information at the right time and place to support them in planning, organizing, directing, controlling, and making decisions [7].

ERP systems enhance the effectiveness and efficiency of e-government, improve the quality of service delivery, optimize the process, and make information available to government agencies. Because the ERP system can be used, it provides a useful source of operational and strategic knowledge for management to quickly and easily correlate, track, and gather all information with the potential for cost savings and performance management in electronic transactions [3].

Concerning changes in public organizations and their adoption of new technologies, e-government has raised operational, functional, and strategic concerns [8]. Company process integration, increased interoperability, improved workflow between company functions, standardized business practices, better order management, and enhanced customer service are all goals of enterprise resource planning (ERP) systems [9].

Furthermore, most information systems in the market lack current information and technical compatibility. The first e-government initiative had several issues that ultimately caused its collapse. The following is a summary of these issues: lack of a well-defined plan and vision for the e-Government phases, insufficient cooperation and coordination between the various investors from the relevant government and agencies and the e-government project team, lack of political leadership, insufficient technological expertise, and an absence of e-readiness among government workers, particularly leaders and upper management [10].

The Yemeni government is still operating as a traditional government because of the country's political and economic environment, the lack of a significant trend towards e-government implementation, and senior leaders' ignorance of the advantages and significance of e-government, including its potential to enhance service delivery, fight corruption, and improve government performance [11].

Since there is no complete awareness of the technological, organizational and environmental factors that affect the adoption of GRP Systems, as well as the challenges and solutions, this paper presents the following benefits and answers the questions:

What are the benefits of GRP technology?

What are the challenges of the adoption of GRP systems?

What are the critical success factors influencing the adoption of GRP systems?

What are the trends and solutions?

2. OVERVIEW OF E-GOVERMENT

The digital transformation of government agencies is known as electronic government, sometimes referred to as e-government or digital government. Most administrative tasks are completed online to boost government efficiency, enhance coordination, and give citizens access to services more quickly. It has to do with several levels of government: ministry, district, and municipality. Governments to citizens (G2C), government to business (G2B), government to government (G2G), internal efficiency and effectiveness (IEE), and government to employees (G2E) are important auxiliary classes included in e-government [12].

Electronic government is known as e-government; it is the government's endeavor to create government systems based on electronic technology. The structuring of government work processes and management systems maximizes the use of information and communication technologies to provide public services to citizens [13]. Additionally, in the context of e-government, a number of factors influence trust, or its absence:

- Security and Data Privacy: People frequently divulge critical personal information when using e-government portals. One important factor influencing trust is the perceived risk of possible data breaches or abuse of this information.
- Reliability and Usability: Users' faith in e-government platforms can be significantly impacted by their usability and reliability.
- Transparency: Promoting openness in governmental activities is a common goal of e-government. Trust is strengthened when platforms offer clear information about procedures, standards for decision making, and how citizens' data are used.
- Prior Experiences: Users' trust in e-government services can be influenced by their prior encounters, both positive and negative. While a history of bad experiences can lead to skepticism, a history of good experiences can foster trust.
- Digital gap: Trust and the digital gap are related. Because they are not used to them, those who are unfamiliar with or lack access to digital tools may naturally be suspicious of services.

The phrase "e-government" has been widely used in previous research. The use of ICT by the government is sometimes referred to as "e-government" [14].

For nations aiming for improved governance, electronic government is becoming a need rather than a choice. The main factors influencing the success of e-government are people and policies [15].

3. E-GOVERNMENT IN THE MIDDLE EAST

IT managers believe that by applying the IT Governance Model ISO 38500 capabilities in their countries, Middle Eastern governments may gain immediate benefits in terms of increased staff productivity and operational efficiency [16]. The Middle East is one of the areas that is currently transforming and making significant progress in adapting to this digital revolution. Therefore, governments of a number of Middle Eastern nations are already working to use ICTs to improve the effectiveness of the public sector [17]. Like any other federal government region, the Middle East is influenced by a number of topics, including Open Government Directive laws and the funding and budgeting of its population. Governments in the Middle East are able to lower IT expenses by sharing information and systems, which also streamlines government office procedures and allows individuals to access information online [18].

In many Middle Eastern nations, government agencies are increasingly asking the public for input on a particular e-service or e-government initiatives in general. Increased usage of fundamental government resources and significant operational efficiencies also result from increased service adoption [16].

4. E-GOVERNMENT IN YEMEN

For Yemeni institutions and ministries that still use traditional manual administration to carry out government businesses and tasks and provide various government services, the shift to e-government has become vital, crucial, and significant. This is especially true given that e-government has emerged as a way to improve government performance; increase efficiency, effectiveness, and transparency, decrease corruption in institution management, increase citizen participation in decision-making, and deliver high-quality services quickly and at the lowest possible cost to citizens, the private sector, and others [11]. The Yemeni government has not moved towards e-government and has adopted it as a primary approach and method, and a serious orientation in the government's plans, programs, and strategies as an entry point for the administrative development of public administration in Yemen. Instead, it is still a traditional government that relies on manual management for the performance of work and tasks and the provision of various government services [9].

5. ERP IN THE PUBLIC SECTOR

The implementation of ERP in governance is known as Government Resource Planning (GRP) [19]. In contrast, another researcher emphasized that ERP systems aim to achieve a number of goals, including better CRM, enhanced IT integration, smooth value chain workflow, enhanced order management, and better business process integration. Even though the private sector accounts for a sizable portion of the ERP market, the largest ERP vendors have begun to create features tailored to the public sector in response to the public sector's desire for more comprehensive organizational systems. The public sector became more interested in ERP because these features were refined [6].

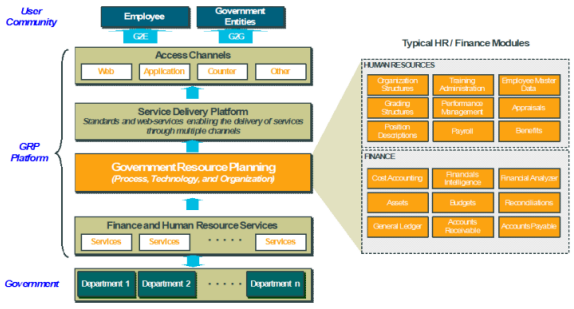

Figure 1. Sample GRP Architecture [22]

Enhancing the quality and performance of public service delivery or creating a more effective and efficient public sector with a high "citizen value is the primary goal of public organizations. Governments and other public organizations are not as profit-driven as businesses are. A public organization's goals are to improve the standards and effectiveness of public service delivery and to create a more effective and efficient public sector [20].

6. GRP SYSTEMS

One way to manage all government resources—people, technology, and business processes—is through the Government Resource Planning (GRP) system [14]. There are several ways to examine ERP. ERP is a commodity, a product in the form of computer software. Second and most importantly, ERP may be viewed as a development goal that aims to map the data and operations of an organization into a thorough integrated structure. Third, ERP is arguably the most important component of infrastructure that offers a business solution [21]. However, another study defined government resource planning as an integrated system composed of modules and applications that work together with a shared database to speed up back-office tasks [22]. Figure 1 shows a GRP framework that dismantles departmental silos by centralizing and standardizing essential government operations such as finance and human resources. This makes it possible to provide integrated services to different user groups via a single platform and various access mechanisms. This paradigm radically changes governance from a disjointed system to an enterprise-wide, data-driven system.

ERP is a framework for organizing all a company's resources, from execution to strategic planning. ERP is currently used in enterprises, and the third generation

of ERP systems (ERP III) has been developed. ERPIII differs from previous generations in its means of development and level of integration between each module and external IT systems [23]. Among the many emerging technologies, centralized information flow is made possible by ERP, an integrated information system that unifies several departments and functions on a single platform [24]. ERP is the centralized, integrated management of essential business operations, which is usually carried out in real time and is facilitated by communication and software technologies [25]. ERP is a technique that businesses employ to manage and connect the crucial components of their operations, as it is one of the largest investments they currently make [26]. On this day of intense competition, enterprise resource planning (ERP) is an essential information management tool for small and medium-sized businesses. ERP is a software program that unifies a company's entire system and facilitates easy exchange of data throughout the enterprise [27]. Another study defined ERP as one of the most significant areas within the information systems umbrella, the Enterprise Resource Planning (ERP) system. All the business functions needed to carry out pertinent procedures are included in the ERP system, which is an integrated software package. Organizations must change their systems and install ERP systems in response to continuously evolving business environments, technological advancements, and increasing competition pressure [28].

7. BENEFITS OF GRP SYSTEMS

The GRP combined IT, finance, human resources, and asset management systems to enable accountability and transparency in government work performance. This benefit was presented in [19]. Another study presents its benefit, as information from both within and outside an organization is combined into a single system by an ERP system. An organization's potential long-term benefits may outweigh the substantial expenditures required to implement an ERP system. An organization can profit from such a structure. According to the Senior Executive of Management Accounting, ERP also assisted the case study company in improving important business operations and procedures. "With an ERP system, everything is recorded automatically," she said [24].

ERP helps employees complete their jobs, and the company may shorten the time needed for each activity [29]. ERP can also compute a large amount of data and generate information that is helpful for making decisions. Consequently, ERP helps the organization enhance operational effectiveness and can also be linked to business process improvement (BPI) [30].

This is also one of our key findings, and we believe that the primary advantages of ERP in management control are as follows: 1) facilitating strategic vision, 2) integrating global standards within the organization, and 3) facilitating transparency in secondary control. For top management, the ERP system became 'an essential tool' that allowed for control and transparency [31].

ERP systems are intended to help businesses and citizens improve their public services. More efficiency, time savings, and improved performance for both enterprises and governments are just a few of the many useful advantages e-government may offer. ERPs are widely used by government agencies in affluent nations, and e-government has been embraced by other governments [3].

The purpose of enterprise resource planning (ERP) systems is to connect several corporate functional areas. ERP solutions combine the divided data and information into a single database and user interface [25]. ERP systems must improve the quality and productivity of end users while reducing the amount of time required to complete activities. Thus, consumers' intention to use a system improves with the system's predicted performance [32]. The GRP system lowers operating expenses, saves time, and improves the quality of services provided to clients [33].

Because of the enhanced efficiency and value of implementing ERP systems and e-government, these themes have taken center stage in government organizations in both developed and developing nations. Therefore, in an effort to improve performance and attain the ideals of the private sector, government agencies have tried to adopt new technologies, such as an ERP system. By improving information availability, e-service features, quality service delivery process optimization, and information quality, e-government can improve organizational performance. The performance of public organizations may be affected by the adoption of e-government [3].

A clean, effective, transparent, professional, and accountable institutional system can be created by integrating GRP application into the government system to enable the e-government concept. This is because data are processed simultaneously in real time, and the appropriate party can monitor and access that type of data [19].

Given these results, ERP systems facilitate an effective budget, improve overall local government governance, and reduce total ICT operating and communication costs. It also encourages financial sustainability [20]. ERP solutions are now an essential component of modern enterprises' competitive business strategies [34].

In one study, the authors developed a framework to demonstrate the value of implementing ERP systems and e-government; these themes have taken center stage in government organizations in both developed and developing nations [3]. According to the conceptual model in Figure 2, e-government capabilities are immediately enabled by the ERP system. By boosting information flow, streamlining procedures, and raising

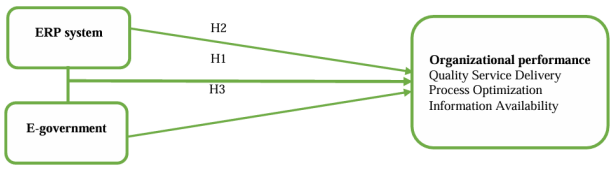

Figure 2. The conceptual framework [3].

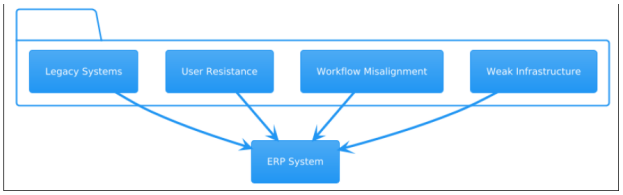

Figure 3. ERP Integration Challenges [36].

service quality, e-government serves as a mechanism that propels organizational performance. In essence, the model depicts a value chain in which attaining transformative public sector outcomes requires technological integration.

8. CHALLENGES OF ADOPTING GRP SYSTEMS

The biggest challenge in adopting an ERP system is the requirement for correct entries (in production lines). Additionally, this indicates that the ERP system requires that the previous process step be documented before the user can proceed with production. However, because the ERP system requires that items be balanced, the subsequent process phase cannot be recorded before the recordings of the preceding process phase have been completed correctly [31].

According to the research, the challenges in placing ERP systems are complex and go beyond simple technical problems; they also heavily involve organizational and socio-human elements. These issues are divided into three temporal phases using a Critical Systems Heuristics (CSH) approach: pre-implementation, during implementation, and post-implementation. Significant misalignment between the organization's culture and the system's requirements, inadequate and erratic senior management support, lack of true organizational need for ERP, and poor ERP system and implementation consultant selection are some of the major issues noted. The study also identified crucial implementation flaws, including subpar change management, insufficient user involvement and training, and internal departmental disputes. Successful adoption depends more on resolving these organizational and human dynamics than on technical requirements alone, as the study suggests that the most dangerous obstacles are often those that arise during the implementation phase [26].

A thorough examination of ERP implementation issues identified a complex range of barriers that endured, from early adoption to extended use. The main obstacles are high financial expenses and complicated and drawn-out implementation procedures [27]. The fundamental tension between the dynamic, changeable realities of operational workflows and the standardized, inflexible logic of ERP systems is a major and recurrent problem that frequently results in employee resistance, erroneous data entry, and untrustworthy managerial reports. Organizations also encounter long-term issues after implementation, such as a shortage of qualified staff to fully utilize the system, susceptibility to cybersecurity risks, particularly in cloud-based deployments, and the challenge of integrating emerging Industry 4.0 technologies and adjusting the ERP to quickly evolving business environments [35].

Another study addressed some ERP Integration challenges presented in Figure 3, which are important to focus on in my opinion [36]. Figure 3 conceptualizes the key internal barriers that obstruct ERP implementation, framing them as direct inputs to the system's failure. This highlights that the challenge is not the ERP technology itself but its collision with outdated legacy systems, incompatible workflows, and resistant users. Ultimately, it presents a causal chain in which unresolved organizational and technical weaknesses directly lead to the ERP system's ineffectiveness.

The researchers synthesized the results from a bibliometric assessment of 52 articles and qualitative interviews to identify the main post-implementation problems of ERP systems in developing nations' garment industries. Additionally, the issues are divided into three main categories: technical issues, such as reliance on vendors, expensive system updates, and security flaws; operational issues, such as misaligned processes, inefficient modules, and inaccurate data that affect production and inventory; and human issues, such as employee resistance, stress, and serious lack of training. According to the study's findings, sustaining ERP systems and reaping their long-term advantages in this particular setting require tackling these three interconnected issues [25]. However, another study offers a new challenge: the availability of digital data, data integration between legacy systems, transitioning business processes from old systems to the GRP system, and the support and commitment of regional leaders and office heads are the primary challenges identified [14].

9. IMPLEMENTATION REQUIREMENTS OF GRP SYSTEMS

This study suggests that an organization will lose productivity and competitive advantage at all levels of value-creating entities if it fails to implement ERP. Therefore, through collaboration and an optimistic view of the end goal, full changes in complete systems, procedures, and other social factors are necessary for a successful im-

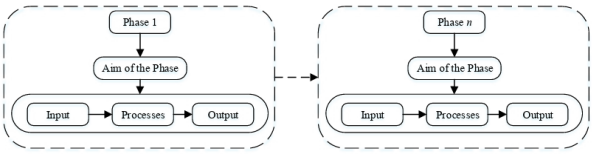

Figure 4. Framework for the implementation of ERP systems [39].

plementation [37]. However, another study presents a contrasting view because despite the fact that many local government organizations are deploying ERP systems in an effort to enhance their business procedures and better serve the public, there is little research on ERP adoption in the public sector [38].

Another study developed a framework for implementing enterprise resource planning (ERP) systems in the workplace [39]. In Figure 4, a phased input-process-output approach for constructing complicated systems, such as GRP, is described in this framework. Each phase is a standalone module with clear goals that uses organized procedures to convert particular inputs into tangible outputs. To ensure controlled progression and quantifiable results at every stage, the model emphasizes a methodical, iterative approach, where the output of one phase feeds as input to the next.

The author argues that for successful and sustainable ERP implementation, managers must [40].

1. Secure unwavering top-level sponsorship first and foremost.
2. Focus on reengineering business processes to fit the ERP rather than over-customizing the software.
3. Proactively manage organizational change to ensure user adoption and minimize resistance.

Another study presented three stages involved in an enterprise resource planning (ERP) implementation project: 1) pre-implementation, (2) implementation, (3) post-implementation [41]. Summary of Key Implementation Requirements.

- Identify and prioritize CSFs. And allocate time and budget optimally.
- Monitoring progress using logistic performance curves. A quantitative model (e.g., CNL_ERP) was used for planning and adjustment. This ensures organizational readiness and vendor support.

10. METHODELOGY

Review Approach

This study used a Systematic Literature Review (SLR) approach. The SLR method consists of a problem statement and research questions, a Search Strategy, inclusion and exclusion criteria, a Study Selection Process, data extraction, and review writing. The SLR method was chosen to ensure comprehensive coverage of current research on the adoption of e-government Enterprise Resource Planning (ERP) systems. The purpose of this review is to adopt the technological, organizational, and environmental dimensions while identifying the challenges, research gaps, and emerging trends.

Problem statement and research questions

Since there is no complete awareness of the technological, organizational, and environmental factors that affect the adoption of GRP(GRP) systems, as well as the challenges and solutions, this study presents the following benefits and answers the questions:

- What are the benefits of GRP technology?
- What are the challenges of the adoption of GRP systems?
- What are the critical success factors influencing the adoption of GRP systems?
- What are the trends and solutions?

Search Strategy:

The search strategy is a method for identifying keywords for database search. The databases were searched as follows:

- IEEE Explore
- Science Direct
- Scopus
- Springer
- Google Scholar
- ACM
- Wiley Online Library.

The search focused on research between 2015 and 2024 related to the following keywords:

- GRP
- Factors Influencing of GRP
- A Systematic Literature Review of GRP
- Adoption Factors of GRP
- GRP system
- Challenges of GRP
- Benefits of GRP
- Challenges of adopting GRP systems
- Implementation requirements of GRP systems.

Inclusion And Exclusion Criteria:

In this study, certain criteria were used to include or exclude studies.

Inclusion Criteria:

- Publications in peer-reviewed journals or conferences between 2015–2025.
- Studies focusing on e-Government or ERP/GRP adoption.
- Empirical, technical, conceptual, or review-based studies examining adoption factors or challenges.

- Written in English.
- research design
- clarity of objectives
- data collection methods
- relevance to the research scope

Exclusion Criteria

- Duplicate studies
- studies lacking methodological detail
- studies in Arabic

Study Selection Process

The initial search for previous studies amounted to 250 studies, of which duplicates were removed, resulting in 180 studies. Of these, 50 were in Arabic, 130 were in English, and 50 fully met the inclusion criteria. Figure 5 shows the flow diagram of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

A Quality Assessment:

We conducted a rigorous quality assessment to ensure that all the studies met the methodological criteria for a systematic review. Each study was evaluated using predefined criteria, including the research design, clarity of objectives, data collection methods, and scope. The assessment process also evaluated the transparency of the methodology, reliability of the results, and extent to which each study addressed potential biases and limitations.

All the 50 selected studies demonstrated an acceptable level of methodological integrity. Studies with unclear research procedures or weak analytical methods were excluded during the initial screening. The final group of studies showed a strong conformity with the inclusion criteria. This rigorous assessment ensured that only those studies with strong methodological frameworks and high credibility were included in the final review.

Data Synthesis Method (Coding, Classification, and Ranking):

To systematically synthesize the selected studies and analyze the factors influencing the adoption of GRP systems, we used a structured three-stage approach: coding, classification, and ranking. First, an open and descriptive coding process was conducted to extract key information from each study, including identified adoption factors, research contexts, methodologies, and findings. This coding approach enabled the extraction of recurring themes related to the technological, organizational, and environmental factors affecting GRP adoption.

Second, the coded elements were organized into thematic categories to enable classification. Studies were grouped according to the type of adoption factors they addressed (e.g., accessibility, Security, Availability, Integration, Usability, Relative advantage, Complexity, Compatibility, Size of the firm, IT capability and infrastructure, top management support, organizational structure and

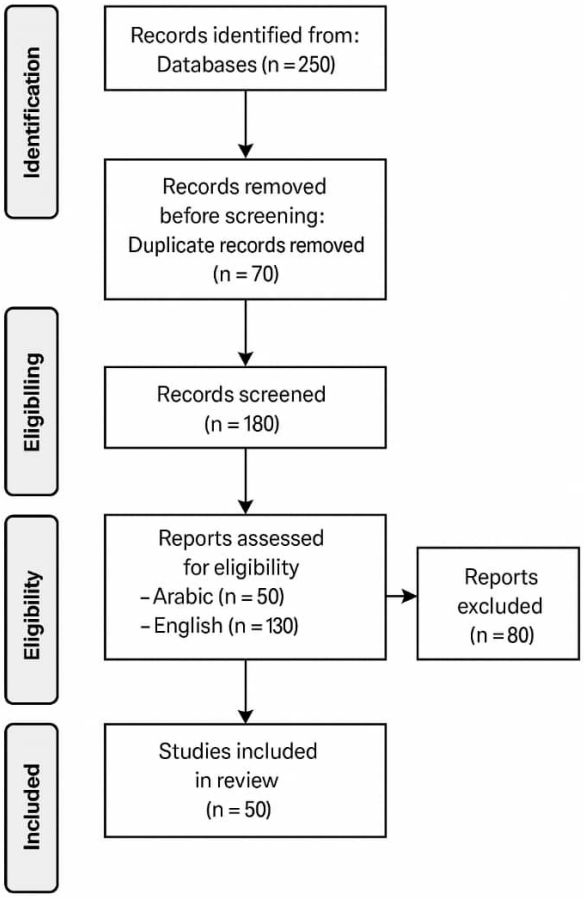

Figure 5. PRISMA Flow Diagram

change management, financial and human resources, organizational culture, external and technical support, legal and regulatory frameworks, economic pressures, competitive pressure, and cost savings). The classification ensured conceptual clarity and facilitated the comparison of findings across different studies. Additionally, we applied a ranking procedure to assess the relative importance and strength of the identified factors. We ranked the studies based on methodological quality, clarity of evidence, and the frequency with which specific factors appeared in the literature. This systematic ranking enabled the identification of the most influential factors affecting GRP adoption, and provided a strong empirical foundation for the synthesis presented in this review.

Data Extraction and Review Writing:

Relevant data were extracted for each study, such as the title, year of publication, and content of the research, in terms of methodology, conceptual framework, shortcomings and problems addressed, criteria used, factors affecting the adoption of e-government, challenges, and benefits. In addition, the research was synthesized, analyzed, and classified according to the influencing factors and degree of priority given to each factor. A conceptual framework was then developed based on the most influential factors in e-government adoption.

11. THE CRITICAL SUCCESS FACTORS INFLUENCING THE ADOPTION OF GRP SYSTEMS.

To determine and rank the Critical Success Factors (CSFs) necessary for the effective implementation of GRP systems, this systematic review summarizes the results of 50 selected studies (Table 1). The strong Technology-Organizational-Environmental (TOE) framework, which offers a comprehensive lens for examining technology breakthroughs within an organizational environment, was used to identify the components. In addition to highlighting the relative significance of these elements, the study indicates notable differences in how they are applied and influence various institutional and national contexts.

11.1. The Predominance of Factors

This review's key conclusion is that although technological underpinnings are essential, organizational and environmental factors are the most important factors in determining the success of GRP adoption. **Top Management Support (TMS)**, which received the greatest priority (mentioned in 20 studies), is the most commonly cited CSF in the literature. This element goes beyond simple sponsorship; it includes proactive leadership, advocating for initiative, obtaining resources, and promoting organizational transformation. The lack of solid TMS is frequently the main cause of project failure in developing nations, such as Yemen, where typical bureaucratic inertia is considerable. This is because it is unable to overcome objections and align various departmental agendas. By contrast, TMS is essential for long-term value realization and strategic monitoring in more digitally advanced situations, rather than just getting past early deployment challenges.

The integration of the GRP system with an organization's current work processes, technology infrastructure, and cultural values is a major adoption prerequisite that is highlighted by the second most important aspect of **compatibility** (mentioned in 15 studies). Compatibility is particularly difficult in the public sector, which is frequently defined by deeply ingrained procedures and old systems. This includes religious and cultural harmony in Middle Eastern settings. Research conducted in Saudi Arabia, for example, shows that GRP systems encounter strong user opposition if they are thought to be at odds with the Islamic values of accountability and openness. In contrast, compatibility concerns are more frequently technical (such as data integration) than sociocultural in secular or technologically agile environments. **IT Infrastructure and Capability** (13 studies) and **External and Technical Support** (13 studies) were ranked third in importance. The two elements are intricately linked. The foundation of GRP systems is a strong IT infrastructure. Without it, even the most advanced system is rendered useless. In developing nations, such as Yemen and Algeria, where basic ICT infrastructure is still lacking, this is a significant problem. On the other hand, advanced competencies, such as cybersecurity and cloud readiness, have become more important in industrialized countries. In situations where internal technical competence is scarce, the crucial function of external supportfrom vendors and consultantsis particularly important. This guarantees that the system is properly configured and maintained, while bridging the knowledge gap. However, relying too much on outside assistance may result in problems such as vendor lock-in, which is a major issue raised by research on cloud-based GRP solutions.

11.2. The Critical Role of Security and Complexity

Although its interpretation differs, **security** is regularly ranked as a top-tier priority (as mentioned in nine studies). Internal data access restrictions are the main emphasis of security in conventional on-premise installations. However, as cloud-based GRP become more popular, the security paradigm grows to encompass vendor dependability, data sovereignty, and defense against outside intrusions. This development reveals a comparative divergence: whereas security is a top priority for all governments, particular risks and countermeasures vary greatly between cloud-native and legacy adoption situations.

Similarly, **complexity** was a recurrent obstacle (mentioned in seven studies). The intrinsic complexity of a GRP system can scare consumers and impede its adoption. However, technical complexity and perceived complexity must be distinguished in this topic. While the latter is subtler and frequently stems from inadequate change management and unclear information regarding the system's relative advantage, the former can be lessened through training and user-friendly design. This distinction is important because if a system's advantages are well explained and its usage encouraged, it might be technically complex and yet achieve high adoption.

11.3. Comparative Analysis Across Contexts

Comparative examination shows that the manifestation and weighting of CSFs are not consistent; they are strongly impacted by the particular governance setting and the degree of development of a nation.

- **Developed Nations:**
  The adoption debate frequently focuses on integrating emerging technologies and optimizing value (e.g., AI, Big Data Analytics with Cloud ERP). More significant drivers include **Relative Advantage** and **Competitive Pressure** (from other effective administration).

- **Developing Nations (e.g., Yemen, parts of the Middle East):**
  The fundamental issues must be the main focus. In this case, financial resources, **top management support**, and **IT infrastructure** are not only success factors, but also essential requirements that the project cannot even begin without. In these contexts, the environmental component of a supportive legal and regulatory framework is also important for fostering trust and requiring change.
- **Cultural-Religious Contexts (e.g., Saudi Arabia):**
  The literature shows that the standard TOE framework needs to be enhanced. Adoption models that incorporate culturally particular values, such as religious precepts like cooperation and perfection, show that environmental forces can have deeply cultural elements rather than just regulatory or economic ones. This is an important characteristic of the CSF.

11.4. Synthesis and Interpretation

The results clearly show that GRP adoption is a complex problem that cannot be resolved using technology alone. Interactions between these elements are crucial. For instance, obtaining financing for **IT infrastructure** and managing the organizational change required to overcome system **complexity** requires strong **support top management**. Similarly, without a **compatible** organizational culture that is open to change, **external technical support** is useless.

Consequently, the conceptual model shown in Figure 6, which incorporates several TOE elements, accurately depicts adoption ecology. This emphasizes the need for policymakers to adopt a comprehensive and well-rounded approach. Investing in technology, while neglecting organizational change management or regulatory frameworks, creates a fragile foundation for adoption. Implementations that concurrently address technology readiness, promote organizational buy-in from top to bottom, and function within a supportive and culturally aware environmental setting are the most successful, as demonstrated in literature.

12. CONCEPTUAL MODEL FOR FACTORS INFLUENCING THE ADOPTION OF GRP SYSTEMS

Based on a comprehensive synthesis of the literature and the identified Critical Success Factors (CSFs) in the previous section, this study proposes a conceptual model to elucidate the dynamics influencing the adoption of GRP systems. The model is grounded in the well-established Technology-Organization-Environment (TOE) framework, which provides a robust lens for understanding technological innovation adoption at the organizational level.

The proposed model, illustrated in Figure 6, posits that the Adoption of GRP Systems is a function of three

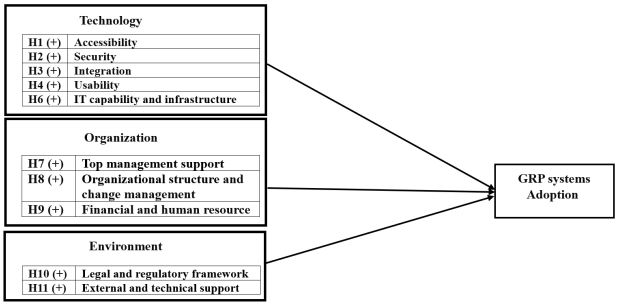

Figure 6. The Conceptual model

key dimensions: Technological, Organizational, and Environmental factors. The model hypothesizes the direct and influential relationships between these dimensions towards adoption decisions. Arrows (→) indicate the proposed directional influence of each factor category on the adoption process.

Technological Context: The organization's internal technologies are included in this dimension. Accessibility, IT Capability & Infrastructure, Security, integration, and usability are the elements incorporated into the model, which is based on SLR. According to the model, these technological features have a direct impact on the organization's view and, as a result, its choice to implement the GRP system. For example, higher security and a strong IT infrastructure are seen to have a beneficial impact on adoption.

Organizational Context: The traits and assets of an organization are discussed in this dimension. Along with Organizational Structure & Change Management and Financial & Human Resources, the model identifies top management's support as the most important component. This context's arrow shows that internal organizational leadership and preparedness are essential motivators (→) for starting and maintaining the adoption process.

Environmental Context: The dimension represents the setting in which the company operates. The model considers elements such as the legal and regulatory framework as well as external and technical support (also known as vendor support). These outside factors have a major impact (→) on the organization's adoption choice, influencing the opportunities and limitations it encounters.

It is crucial to emphasize that this model is conceptual and requires further empirical validation. The links shown are assertions, even though the evaluated literature provides substantial evidence. To confirm the strength and importance of these suggested links, future research could evaluate this model using quantitative techniques (such as structural equation modeling) or qualitative case studies in particular e-government situations. The model provides academics and policymakers with a fundamental framework for methodically analyzing and addressing the many elements that impact the effectiveness of GRP

Table 1. Critical Success Factors (CSFS).

Perspectives	Critical Success Factor	Studies	Total	priority
Technological Factors	Accessibility	[42],[43],[44]	3	9
	Security	[45],[42],[46],[47],[48],[49],[50],[49],[48]	9	5
	Availability	[42],[48],[51]	3	9
	Integration	[42],[48]	2	10
	Usability	[43],[48],[52],[53]	4	8
	Relative advantage	[42],[45],[50],[54],[55]	5	7
	Complexity	[50],[54],[56],[57],[58],[55],[59]	7	5
	Quality	[42],[48]	2	11
	Compatibility	[45],[46],[47],[48],[49],[54],[56],[57],[55],[59], [46],[20],[60],[61],[62]	15	2
	Trialability	[42],[45],[50],[55]	4	8
	Size of the firm	[46],[47],[57],[46],[60],[62]	6	7
	IT capability and infrastructure	[42],[46],[47],[48],[49],[51],[53],[54], [11],[56],[55],[46],[60]	13	3
	Observability	[42],[45],[55]	3	9
Organizational Factors	Top management support	[42],[43],[48],[49],[51],[54],[11],[56],[57],[55], [59],[61],[62],[4],[7],[12],[1],[63],[64],[65]	20	1
	Organizational structure and change management	[42],[43],[48],[49],[51],[11],[56]	8	5
	Financial and human resource	[44]	1	12
	Organizational culture	[42],[49],[56],[12],[1]	5	7
	External and technical support	[43],[46],[48],[49],[51],[11],[59], [46],[60],[61],[62],[1],[64]	13	3
Environmental Factors	Legal and regulatory framework	[42],[43],[11],[56],[55]	5	7
	Economic pressures	[43],[46],[49],[11],[59],[46],[12]	7	6
	Technology Adopting by the government and employees	[49],[51],[52]	3	9
	Competitive pressure	[11]	1	12
	Cost saving	[50]	1	12

programs.

13. RESEARCH GAP AND FUTURE DIRECTIONS

The research gap in this study is summarized by the scarcity of studies analyzing or investigating the factors affecting the adoption of ERP systems in e-governments, as well as identifying the critical success factors for GRP system adoption. Building on these gaps, future research should pursue several critical research directions. First, a fundamental shift in focus is needed from *the initial adoption* to the *post-implementation phase*, investigating long-term institutionalization, user infusion, and the tangible realization of benefits. Concurrently, studies must address the influence of technological evolution, specifically by examining the unique drivers and barriers for cloud-native, AI-integrated, and cybersecurity-centric GRP systems.

Methodologically, the field will benefit from adopting longitudinal and mixed-methods designs to capture the dynamic nature of the adoption processes over time. Finally, the conceptual model proposed in this study, based on the TOE framework, provides a comprehensive foundation but remains conceptual. A significant research direction is the empirical testing and refinement of this model across different national and cultural contexts, particularly in developing countries such as Yemen, to validate the hypothesized relationships and identify any context-specific moderating factors.

14. THE CHALLENGES AND SOLUTIONS

The first study [14] successfully uses the UTAUT2 model, but by eliminating the "Price Value" variable and claiming the service is free, it exposes a crucial methodological flaw. The substantial "hidden costs" of implementation, training, and change management, all of which are essential in a public sector setting, are overlooked by this limited perspective. It ignores long-term use in favor of concentrating only on initial user intention. [28, 33] These two studies play a crucial role in exposing

a significant theoretical gap: the cultural and religious blindness of conventional models. While [28] suggests practical steps, such as consulting cultural counselors, [33] makes a more profound contribution by formally integrating Islamic principles (Perfection, Cooperation, etc.) into the UTAUT/TRA framework. This represents a significant advance, moving from merely acknowledging culture to formally operationalizing it within a theoretical model. However, the generalizability of this religious-based model to other contexts remains untested. [38, 66]: Both studies accurately pinpoint poor communication and organizational resistance as the primary reasons for failure. However, by using the (STS) theory, which stresses matching the social and technical subsystems, [38] provides a more advanced solution. In contrast, standard Business Process Reengineering (BPR) was recommended by [66]. Because BPR may be seen as unduly mechanical and as a catalyst for the very resistance mentioned, the STS approach from [38] is perhaps more comprehensive.

[67, 68] These studies underscore the persistent, "baseline" challenges of inadequate training, hardware, and support. The fact that these same issues were reported years apart [67, 68] indicates a critical failure in learning from past implementations. They highlight a recurring implementation gap, in which fundamental project management and resource allocation principles are neglected.[53] This study provides crucial theoretical insights by challenging conventional wisdom. It is found that factors such as ICT Experience and Infrastructure are "hygiene factors" (i.e., expected but not motivators) rather than direct drivers of adoption is a significant contribution. It forces a shift in research and practice away from basic facilitators and towards more complex factors, such as perceived utility and advanced functionality. [43, 61] These papers are central to the discussion on Cloud GRP. They move beyond generic security concerns to address specific critical issues in cloud adoption: data locality, vendor lock-in, and the reliability of Cloud Service Providers (CSPs). [43]'s discussion on the Total Cost of Ownership (TCO) versus initial cost is a more nuanced and realistic financial analysis than typically found in earlier studies.

[45, 69]: These investigations draw attention to contextual constraints. [69] It acknowledges its sampling and geographic constraints, which is a common fatal flaw in this discipline where single-country case studies predominate. On the other hand, [45] examines a wide range of OSERP difficulties in SMEs, but it runs the risk of becoming a "laundry list" because it does not clearly rank the most important elements. A comprehensive analysis of these studies demonstrates fragmented but increasing knowledge of the difficulties associated with GRP adoption. Although basic research such as [14] and [67] used customized models to effectively identify initial hurdles, they frequently lacked contextual richness. Studies such as [33, 53], which question the straightforward application of standard models by highlighting the critical significance of cultural conceptions and the "hygiene factor" character of basic infrastructure, represent a substantial theoretical advancement. Concurrently, studies on cloud-specific difficulties [43, 61] have been developed to tackle complex problems, such as vendor lock-in and TCO. The lack of longitudinal research, however, is a continuing gap because most studies, including the most recent ones [68, 69], only offer a moment in time, failing to capture how these issues change and interact over the course of the system's lifecycle from adoption to institutionalization. Although the discipline excels in identifying issues, it frequently fails to offer scalable and validated solutions, especially in terms of long-term sustainability and value generation. Table 2 summarizes the solutions and trends.

Table 2. summary table of challenges and solutions

Ref	year	Challenges	Solutions
[14]	2021	• The availability of digital data, data integration between legacy systems, transitioning business processes from old systems to the GRP system, and the support commitment of regional leaders and heads of offices are the primary challenges identified.	• created hypotheses and a research model. • The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model was the one they selected. According to this concept, a number of elements, including social pressure, existing practices, and the ease of use of a system, can predict whether or not someone will plan to use a technology. • Since SIMPATIK is a free government service, they modified the model by eliminating the "Price Value" variable.

[33]	2022	• Adoption Model Mismatch: Important local and religious factors that have a big impact on employee behavior in Saudi Arabia are not included in standard technology acceptance models. • Absence of Leverage from Religious Values. • Poor Support & Communication. • One-size-fits-all policy for the government.	• Develop an Adoption Model That Is Culturally Appropriate: Include religious principles in your analysis of how people accept technology. In this context, the study's model offers a more accurate predictor of adoption by incorporating Islamic ideals (Perfection, Cooperation, Transparency, and Responsibility) into the UTAUT/TRA frameworks. • Encourage religious values in the rollout of technology. • Build Support Systems Based on Values • Create a Policy Based on Religion
[28]	2020	• Cultural opposition • Absence of peer or social influence • Concerns about religious compatibility • Peer assistance is inadequate.	• Adapt the system to local values and consult cultural counselors. • Share success stories and make use of influencers. • Make sure the system is in line with Islamic principles and include religious leaders. • Establish programs for mentoring and give parents benefits.
[38]	2022	• Inability to Increase Productivity • Opposition to change • Poor Communication • The system is hard to use. • Focus on Short-Term Implementation	• Align technical and social aspects to maximize ERP's productivity potential. • Early and frequent user involvement (STS Theory method). • Make use of the integrated aspect of the ERP to promote information exchange. • Give top priority to user-friendly design and strong system quality. • During the post-implementation phase, make plans for ongoing maintenance and optimization.
[67]	2021	• Insufficient training for Users • Insufficient User-Friendliness • Not Enough Hardware • Inadequate Network Access. • Lack of Human Resources	• Plan for users to benefit from immediate, useful, and hands-on training. • Make the software's graphical user interface (GUI) more user-friendly and accessible to non-technical users. • Obtain and set up sufficient computer hardware and infrastructure in every facility. • Improve internet connectivity and dependability across all implementation sites. • Send specialized technical personnel to run and maintain the system.

[50]	2023	• Insufficient Decision-Making Experience and Creativity • Privacy and Security Issues • High-Cost Perception • Skill Gaps in Employees • Absence of External Support • Problems with Compatibility	• Spend money on training decision-makers and encouraging creativity. • Set Strong Security Measures as a Priority and Share Them • Emphasize the Long-Term Financial Savings. • Upskill Workers • Optimize External Support and Vendor Systems • Verify and Show System Compatibility.
[68]	2024	• Initial Difficulties of Implementation • Higher Learning Level and Details • User Agreement • Absence of Reliable Support Systems.	• Put in place efficient introduction and customized training. • Create Role-Specific Training and Make Orientation Easier • Make use of social influence and management support. • Offer Dependable IT Assistance and Feedback Systems.
[54]	2022	• Complexity • Skill in IT • Low Demand for Data • Absence of Rewards • Poor Relative Benefit	• Develop user-friendly tools and offer technical training. • Make an IT infrastructure investment. • Encourage the use of OGD by running awareness campaigns. • Launch recognition initiatives • Use case studies, impact reports, and connections to more general digital government objectives to illustrate the benefits of OGD.
[53]	2023	• ICT Experience (H1 not supported) • Infrastructure for ICT (H2 not supported) • Perceived Usability (without support for H4) • Quality of Service (H8 not supported): • Invest on the robustness of your core system.	• Turn Your Attention to Advanced Utility • Be considered a "Hygiene Factor": Make sure the infrastructure is sufficiently dependable and functioning, but understand that this is merely a baseline expectation and not a major factor in determining long-term use. • Put Usability Above Simplicity: put your design and development efforts on improving the system's basic value and utility. • Invest on the robustness of your core system. • Improve Utility Constantly.
[64]	2022	• Expensive and Complex • Insufficient Organizational Preparedness. • Problems with Compatibility • Organizational Structure and Opposition to Change. • The challenge of proving return on investment, or ROI.	• Make Use of Ready-made Solutions • Ensure the support of upper management & Extensive Training. • Put Flexibility First • Implement Change Management • Connect Performance Metrics to Adoption: The study demonstrates that using ERP greatly enhances both financial performance (Reduction of costs, profitability).

[43]	2021	• Security: Loss and Data Leakage. • Security: Recovery and Backup of Data. • Usability: Opposition to Change • Usability: Insufficiently User-Friendly • Vendor: Costs of Maintenance • Vendor: Data Storage Location (Vendor Lock-in): The vendor's data center is where the data is kept.	• Put Strong Security Procedures in Place:(For both moving and stored data, use robust data encryption). • Make Sure Backup Systems Are Available • Communication and Change Management: Put effective change management techniques into practice. • Give Clear UI/UX Priority: Choose cloud ERP solutions with a simple user interface. • Analyze the total cost of ownership (TCO): Conduct a comprehensive TCO study that contrasts the costs of on-premises with the subscription model. • Analyze exit strategies and data governance: Choose suppliers who abide with regional data sovereignty regulations.
[69]	2025	• Low ICT Knowledge of Owners/Managers • Inadequate Support from the Government • Support from Top Management Has a Limited Impact. • The research's geographic and sampling limitations	• Implement focused ICT literacy initiatives by creating and providing online courses and seminars for hands-on training. • Improve Infrastructure & Government Rewards: Offer tax breaks and subsidies. • Increase Knowledge of Cost-Benefit • Perform Nationwide Representative Studies: To inform more effective national policy, promote additional research utilizing probability sampling throughout Algeria.
[61]	2023	• Issues with Data Security. • Dependability of the System • Complexity and Usability • The Cost Structure of Cloud ERP with Government Funding. • Insufficient Outside IT Assistance.	• Strong CSP Agreements & Policies: Put in place clear backup, recovery, and restoration plans. • Choose Reliable CSPs: Choose suppliers who have a history of producing reliable and continuously available solutions. • Support and Training for Vendors: • Vendors are responsible for making sure that systems are easy to use. • It is helpful for SMEs due to its lower total cost of ownership and initial investment. • Good Support Services for Vendors. Continuous help guarantees long-term system effectiveness and reduced discomfort.
[63]	2024	• Insufficient Technical Understanding of Cloud. • Risk to Performance • Security & Privacy of Data • Top Management's Opposition • Pressure from Competition	• Give staff members or the IT team the appropriate training prior to the system's "Go-Live." • As soon as the ERP vendor or implementation partner goes live, make sure they provide strong hypercare support. • Establish strong data privacy policies and carry out frequent security audits. • Top management needs to be informed about the advantages of cloud ERP and participate in the decision-making process. • Utilize cloud ERP as a tactical instrument to obtain a competitive edge.

[55]	2024	• Complexity • Insufficient ICT Infrastructure • Absence of a Helpful Regulatory Framework. • Low Observability & Perceived Relative Advantage. • Inadequate Assistance from Top Management • Problems with Compatibility	• Pay attention to technologies that are easy to understand and use and give sufficient training. • Make investments in and enhancements to the organizational and national ICT infrastructure. • To facilitate the adoption of technology, the government should set up a clear mission and helpful regulations. • Present and explain in detail the observable advantages and better functionality of Cloud ERP/BDA compared to conventional systems. • Make an effort to get senior management to support the adoption process. • Make sure the Cloud ERP and BDA solutions you choose complement the organization's current technical procedures, values, and requirements.
[45]	2021	• The complex structure of OSERP systems. • Absence of ICT Facilities • Lack of IT Skills • Absence of assistance from upper management • ERP Systems Are Expensive • Pressure from Competition • OSERP's Limited Trialability • Security Issues • Resistance to Organizational Culture	• Reduce perceived complexity by making system design simpler and offering user-friendly interfaces. • Invest in and modernize ICT infrastructure to facilitate OSERP's deployment and operation. • To improve technological capabilities, offer training courses and employ qualified IT staff. • Teach upper management on the advantages of OSERP and include them in adoption choices. • Use economical OSERP solutions to lower implementation and licensing costs. • Utilize OSERP to enhance corporate procedures and preserve market competitiveness. • Before OSERP is fully adopted, SMEs can test it with trial versions or pilot projects. • To create trust, put strong security measures in place and make sure security features are transparent. • Create an innovative and adaptable culture through internal initiatives and training.
[66]	2021	• High Cost & Risk • Complex Resistance & Organizational Change • Ineffective or misaligned business procedures • Insufficient User Education and Engagement • Insufficient backing from upper management.	• Focus on and quantify non-financial benefits, such as information quality, to support investment. • Put in place effective change management, which includes user training and transparent communication. • Before and during implementation, carry out Business Process Reengineering (BPR) to match business procedures with the ERP's recommended practices. • Early on, provide all users thorough training on new features and procedures. • Make certain that senior management takes an active role in tracking developments and resolving problems.

15. CONCLUSION

This comprehensive literature study clearly demonstrates that the effective implementation of GRP systems in

e-government is a complex undertaking that depends on the comprehensive integration of important variables rather than just technological capacity. According to the investigation, the most important Critical Success Factors (CSFs) for promoting change, guaranteeing alignment with current procedures, and supplying the required technological foundation are Top Management Support, Compatibility, and strong IT infrastructure. Nonetheless, governments, especially those in poor nations, face numerous obstacles, including severe organizational resistance to change, the difficulty of integrating with legacy systems, and severe budgetary limitations. The practical implication of these findings is clear: To overcome these obstacles and realize the transformative potential of GRP systems for improved public service delivery, policymakers and project managers must adopt a strategically balanced approach that concurrently addresses technological readiness, cultivates a supportive regulatory and environmental ecosystem, and fosters unwavering organizational commitment through effective change management, as embodied in the TOE-based conceptual model.

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