FACTORS DETERMINING THE ADOPTION OF E-PROCUREMENT IN DEVELOPING COUNTRIES: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Technology is present to have an impact on business processes, E-Procurement is one form of this technological development. E-Procurement is a transaction for the procurement of goods and services by using internet services as a connecting tool in the transaction process. This research aims to investigate the determinants of adopting e-procurement in several developing countries. This study reinforces the results of previous research on the determinants of E-Procurement adoption presented in the form of a systematic literature review (SLR). To evaluate and understand the patterns or themes of the selected documents, a systematic literature review is then carried out. In this study, 157 documents from various countries were published in peer-reviewed journals from 2000-2022 which were systematically reviewed. The results of the study reveal that in general the determinants of an entity in adopting E-Procurement are politics, socio-economic, demographic, geographical, government regulations, supplier participation and intentions, external organizational pressure, internal organizational support, network connectivity/integration, increased task or convenience in work, organizational culture, perception of resources, company size, electronic systems for processing orders and invoicing, organizational factors, readiness factors, supply factors, strategic factors, policy factors, innovation factors (Trust, Excellence/ benefits and image) moderating factors (uncertainty), Current Problems, Facilitators, inhibitors, potential benefits, Quality of Information (Online Information, Purchasing Procedures) and Quality of Logistics Fulfillment (accuracy of orders fulfilled, timely orders fulfilled).

INTRODUCTION

The era of the industrial revolution 4.0 has made many changes to world developments, especially in the field of technology. Technology has now been adopted in various fields, both in the private sector and in the public sector. In the public sector, this technological sophistication is known as E-Government which is now used in E-Procurement either in the adoption process or has used the E-Procurement system (Vaidya et al., 2017). Technology has provided many benefits to the government sector including in the field of public administration and in electronic procurement which can provide the best at a lower cost (Moons, 2018), according to (Carmeli A, And Freund A, 2004). Another benefit obtained through implementing e-procurement practices is that the Government can reduce administrative costs associated with procurement by reducing the number of people and time associated with the procurement process. For example, in a typical manual system, users must first find suppliers, obtain appropriate paper catalogues, select items, and seek and obtain management approval. After reviewing and approving the requisition by a procurement professional, the purchase order will be faxed to the supplier. This fax will be followed up with a phone call to verify receipt, and then copies will be sent to shipping and receiving, accounting and finance, and department managers.

These paper-based systems are sequential, prone to errors, encourages excess inventory, and makes integration across the enterprise very difficult. With E-procurement, the process is much different and more efficient. Employees can access approved vendor catalogues from their personal computers, identify and compare items needed, and place orders. Product availability and shipping information are easily accessible, and payments can be made electronically. Utilizing internet facilities as a tool for business to business (B2B) transactions has been carried out by many academics and practitioners (Bartoccini, 2001; Carabello, 2001). Electronic business is the use of internet technology which is used to simplify the process of an activity by providing various benefits such as increasing productivity and increasing efficiency (Muffatto & Payaro, 2004).

E-Procurement is an information and communication technology (ICT) intervention in the purchasing domain of an organization and usually covers all processes from requesting materials from users to payment of suppliers (Brandon Jones, 2017;Alvarez-Rodr-sayaguez et al., 2014; Rajkumar, 2001) . E-procurement or EP for short is defined as a comprehensive process in which governments use IT systems to establish agreements for the acquisition of products or services (contracts) or to purchase products or services in exchange for payment (purchases). E-procurement uses a variety of elements, including electronic ordering, Internet bidding, buying cards, reverse auctions, and integrated automated procurement systems (Moons, 2018). Based on Gunasekaran et al. (2002), EP will enable companies to shorten procurement periods, obtain reasonable bids, reduce product design time frames and speed up product launches. Using e-procurement can facilitate the government in the process of procuring goods and services, this will certainly have an impact on the government's financial performance, which by using the e-procurement system can reduce costs with clearer accountability and transparency (Mélon, 2020). Using E-Procurement can provide benefits to an organization, some of the benefits include lower transaction costs, lower staff requirements, shorter procurement cycles, reduced inventory levels, higher levels of transparency, and increased communication and collaboration between supplier and buyer organizations (Davila et al., 2003). ; Turban, King, Lee, Warkentin & Chung, 2002; Osmonbekov, Bello & Gilliland, 2002; Carter et al., 2000; Rajkumar, 2001; Min & Galle, 2003). The other benefits gained by adopting E-Procurement are (1) The added value of the Internet lies in its ability to contribute to reducing costs associated with communication and transactions. The Internet allows access to vast amounts of information at a lower cost of time and money than would be obtained from using any other tool, both within and outside the organization; (2) the use of E-procurement helps to decentralize purchasing processes which are more administrative as well as to centralize the most strategic ones (eg, supplier selection); (3) the use of this technology promotes better coordination within the company and increased efficiency; (4) the use of the Internet in the purchasing process makes it possible to quickly obtain a large amount of quality information and, therefore, reduces the risks and uncertainties associated with purchases (5) E-procurement is an element that creates value for companies and (6) this technology contribute to driving trust between companies. Greater transparency supports communication and collaboration between buying and selling organizations (Boyle and Alwitt, 1999; Min and Galle, 1999; Avlonitis and Karayanni, 2000; Tang et al., 2001; Boyd and Spekman, 2001; Porter, 2001; Aberdeen Group , 2001; Arthur Anderson Business Consulting, 2001; Essig and Arnold, 2001; Boer De et al., 2002; Puschmann and Alt, 2005). e-procurement increases transparency and competition among suppliers and reduces bureaucracy, procedure duration and overall costs; the difficulty and impact of e-procurement implementation depends on the administration level of PCA; and the lack of skilled human resources and ICT limits e-procurement implementation (Aguiar et al., 2013).

With several benefits provided by E-procurement services have an impact on increasing the use of E-procurement in an organization compared to the traditional or paper-based procurement of goods and services so that this can motivate organizations to adopt it (Kumar & Ganguly, 2020). Several developing countries have adopted E-Procurement, including in European countries. All European countries have recognized the advantages of using information and communication technology (ICT). This can be seen from the use of online services, one of which is in the field of E-Procurement services in the public sector (Aguiar et al., 2013). In this regard, some experts suggest that implementing e-procurement in the public sector can foster citizens' trust in public services, which, in turn, facilitates more impartial government administration, greater public sector efficiency, and lower contract enforcement costs (Von Haldenwang, 2004; Gunasekaran and Ngai, 2008; Shim and Eom, 2008; Anderson, 2009). Innovation in the procurement of goods and services using E-procurement is very important, this is because using E-procurement can enable improvements in terms of

efficiency and quality, in the management of physical, information and financial flows. In addition to increased productivity, very significant changes have been achieved by technological innovation in the structure of relationships between suppliers, manufacturers, distributors, intermediaries, customers and in the company's strategic choices. In particular, in a competitive environment where the main resource is represented by information, an important role is played by technology facilitating its acquisition, use and management. The introduction of e-procurement can reduce the discretionary power of public officials, promote public sector accountability, eliminate lengthy tender procedures, increase transparency and lead to higher quality public goods (Mélon, 2020). Another benefit that can be felt from using E-Procurement is that Using the Internet to replace private networks can have large cost savings as a result of simplified communication. Property decision makers also believe that e-Procurement has the potential to reduce infrastructure and transaction costs and improve audit efficiency and control, which helps control costs (Kothari et al., 2005).

Problems regarding the adoption of e-procurement technology systems are still common in developing countries, such as European countries (EU). in 2010 the EU targeted that by that year 100% of all had the ability to procure electronically, but in reality in 2010 only 50% had the ability to adopt the E-Procurement system (Aguiar et al., 2013). the adoption process of e-Procurement provides a contradiction in its implementation. In order to understand the challenges posed by e-procurement, it is necessary to understand the basic paths to follow when awarding public contracts. In the area of Public Procurement, the EU directive describes three types of procedures: open procedures, limited procedures and negotiated procedures. In an open procedure, all interested suppliers, contractors or service providers may bid in response to published contract notices. In restricted procedures, only suppliers, contractors and service providers who have been invited to participate by the contracting authority may bid (Carayannis & Popescu, 2005).

Based on research conducted by Batenburg, European countries differ in the level and speed of e-procurement adoption in various developing countries. More than 60% of respondents from German and British companies said they use online purchasing compared to around 40% of others (Polish, French, Italian and Spanish organization Estonia) (Batenburg, 2007).

The benefits of using e-procurement in European countries are generally almost the same as in other developing countries such as cost savings and transparency (Carayannis & Popescu, 2005), this can be seen from the practice of procuring EU public goods, where the procurement is procedural and paper-based which has a sizable cost period and a long waiting time in the procurement process. Because documents are sent by fax, postal mail, and telex, a series of issues such as readability, delay, and validation have cost the entity through delays in contract execution or the cost of reduced competition in the market.

In Portuguese, there are still many problems and contradictions related to the adoption of e-procurement. The adoption of E-Procurement in Portugal itself began to be implemented on November 1, 2009. When compared to countries in the EU, Portugal was the first country to adopt E-Procurement with an impact assessment.

Based on studies on the implementation of e-procurement in a number of UK public sector organizations, these researchers assert that economic benefits are a significant factor in the adoption of e-procurement (Aguiar et al., 2013). They also emphasize the importance of commitment and organizational support and training which have been shown to be key factors influencing the use of Internet purchasing tools.

The e-Procurement technology is still considered to contain significant risks. In general, there are several problems that are often encountered in developing countries, when viewed from a technological point of view, the lack of accepted standards as a whole prevents a large number of entities from adopting the technology. Such entities are afraid to purchase 'closed' technologies that cannot communicate with other technologies and thus limit access to the wider network of supply chain constituents. But the risks are not limited to technology, they also involve the business models that will emerge to support e-procurement technologies. This technology will redefine supplier – customer relationship – who can be a supplier? who pays for the investment required to access the technology? what information is shared? The success of some e-procurement technologies depends on the network effect that occurs only when enough players adopt the technology. Finally, there are risks that bridge business and technology, including the security and control systems that will ensure the reliability of e-procurement technology (Davila et al., 2004).

This study contributes to E- Procurement in the Public Sector by paying attention to the determinants of E-Procurement adoption. Filtering from the overall research question, this study addresses two other sub-questions; (1) Factors of E-Procurement adoption in developing countries, and (2) E-Procurement Adoption Strategy

METHODS

In collecting research data, the authors conducted initial datasets on online databases such as "Elsevier Science Direct," "Emerald Insight," used to search existing literature. This review considers publications on e-procurement adoption, use, and performance over the last twenty-two years from 2000 to 2022. This analysis includes only articles written in English and published in peer-reviewed scientific journals. A database search was carried out using keywords such as "E- Procurement adoption, E- Procurement in the public sector", "electronic procurement adoption", "use of electronic procurement", "electronic procurement performance", and "government/ public electronic procurement".

Researchers use various combinations of keywords to find a comprehensive list of all relevant papers. The initial search yielded approximately 157 research publications from all databases. These 157 papers were subjected to screening based on title and abstract. Articles such as reports, book reviews, review papers, conference papers and data articles are excluded in the screening process. The papers screened in the screening were then critically studied by reviewing the manuscripts for suitability for E-Procurement adoption. Approximately 157 papers were screened through manuscript review and selection criteria. The 38 papers, which were selected, were further examined by reading the entire article. Based on scientific judgment, irrelevant publications are filtered out after reading. In order to find suitable papers that were not detected through online searches, reference tracking was carried out. Paper review, refinement and sorting not only describe in-depth coverage but also capture critical aspects of the literature (Hosseini, et al., 2019). The final evaluation of all the articles obtained became the most relevant 38 articles from 17 countries, as listed in Table 1 which describes the distribution of articles in each country.

Table 1. Country of Origin and Number of Articles

Number	Country	Number of Articles
1	United States of America	12
2	India	7
3	United Kingdom	3
4	Australia	2
5	Malaysia	2
6	Belgium	1
7	Canada	1
8	United Kingdom	1
9	Hong Kong	1
10	Indonesia	1
11	Nepal	1
12	Dutch	1
13	Singapore	1
14	Taiwan	1
15	Thailand	1
16	Turkey	1
17	UAE	1

Based on table 1, it can be concluded that the publication of articles that have the most publications in accordance with the topic in this study is the United States and followed by India and England and several other countries. From the results of document identification, researchers found 31 studies conducted in the private sector and 7 studies conducted in the government sector.

RESULTS

After collecting articles and finding as many as 38 articles that are in conformity with the topic of the problem, then the articles were reviewed by Literature Review and classified into various categories for better information analysis. Information from each article is thoroughly evaluated to record data concisely for each category. For better information analysis, Microsoft Excel has been used to record content. The various

categories identified for this literature review were: chronological study publications, journal study publications. Geographical location, public and industry sectors, methodology used, theory/framework and model used in the research, the following describes the names of the journals of the 38 articles selected according to the research topic.

Table 2. Journal Name

Sr. No	Journal name	No. of papers
1	International Journal of Production Economics	6
2	Industrial Management and Data Systems	3
3	International Journal of Operations and Production Management	2
4	Journal of Enterprise Information Management	2
5	Journal of Operations Management	2
6	Transforming Government: People, Process, and Policy	2
7	Benchmarking: An International Journal	1
8	Computers in Human Behavior	1
9	Electronic Government, an International JournaL	1
10	Electronic Journal of e-Government	1
11	IEEE Transactions on Engineering Management	1
12	Industrial Marketing Management	1
13	Information and Management	1
14	Journal of Organizational Computing and Electronic Commerce	1
15	International Journal of Business and Societ	1
16	Internet Research	1
17	IUP Journal of Management Research	1
18	IUP Journal of Management Research	1
19	Journal of International Food and Agribusiness Marketing	1
20	Journal of management information systems	1
21	Journal of Internet Commerce	1
22	Information Systems Research	1
23	Journal of Public Procurement	1
24	Management Research Review	1
25	Journal of Small Business and Enterprise Development	1
26	Omega	1
27	Omega	1

Descriptive Findings

The findings in this research indicate that research publications in the field of E-Procurement are scattered in several developing countries, where in review of publications in this study there are 17 countries that have adopted E-Procurement and are appropriate in this research topic. For research trends from 2000 to 2022 related to research on E-Procurement adoption, it can be explained in Figure 1 as follows:

Figure 1. Years of Research Trend

Based on Figure 1, it can be concluded that the trend of research from 2000 to 2022 began in 2007 with the peak of the trend of research occurring in 2010. Of the 38 articles that were used as a review of this research, the country that had the largest publication was the United States and the research publication was in 2010.

Geographical Location of Research

The geographical location of the research is a description of the area or location that is the object of research on E-Procurement. The document that became the literature review was 38 studies covering almost 17 countries, as shown in Figure 1.2. The majority of studies were conducted in the United States (twelve studies or 29.57%), followed by India (seven studies or 15.28%), United Kingdom (three studies or 8.57%), Australia (two studies or 5.71%) and Malaysia (two studies or 5.71%). Only one study each was conducted in Belgium, Canada, UK, Hong Kong, Indonesia, Nepal, Netherlands, Singapore, Taiwan, Thailand, Turkey and UAE. A single study was conducted covering several countries.
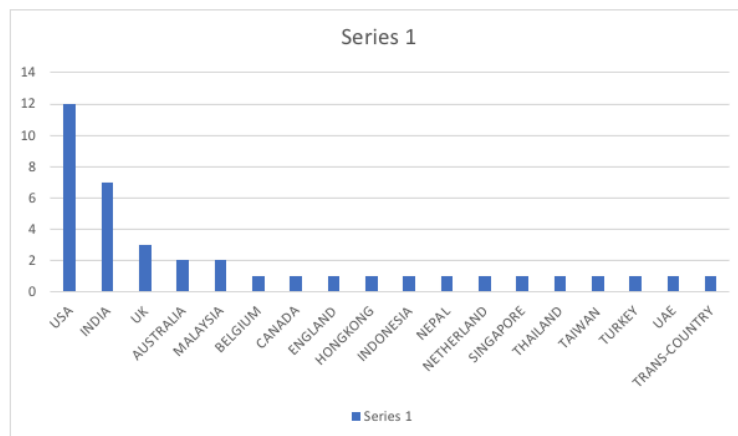

Figure 2. Geographical Location of Research

Based on Figure 2, it can be concluded that the United States is the country that has the most publications on research on the adoption of e-procurement, followed by India and several other countries.

Research approaches, methods and techniques

As for the research approach itself, the researchers found that 34 or 90% of the research used a quantitative research approach with a survey method, namely distributing questionnaires to manager respondents and staff of the procurement of goods and services and 4 studies using a qualitative approach. research techniques used by some researchers generally use quantitative techniques used in data analysis, most studies (18 studies or 58%) use structural equation modelling followed by multiple regression (9 studies or 29%), basic statistics (2 studies or 7%), logistic regression (1 study or 3%) and cluster analysis (1 study or 3%).
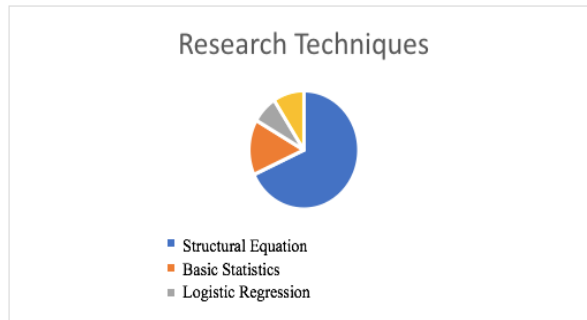

Figure 3. Research Approaches

Figure 4. Research Techniques

Theory findings

The findings show that some researchers use several theories as a basis for their research. theories/models such as the "technology acceptance model (TAM)" (Davis, 1985, 1989; Davis et al., 1989), the "technology – organization – environment (TOE) framework" (Tornatzky and Fleischer, 1990), "theory of planned behavior (TPB)" (Ajzen, 1985, 1991), "innovation diffusion theory (DOI)" (Rogers, 1995), "Delone and Mclean IS success model" (Delone and Mclean, 2003), "institutional theory (IT)" (Teo, et al., 2003), "transaction cost theory (TCT)," "resource-based view (RBV)" and "dynamic capabilities theory (DCT)" are cited as the basis for EP AUP research. As described in Table 2 and shown in Figure 5, some researchers use only a single adoption theory or its modifications, such as the "Delone and Mclean (D&M) IS success model" (Sambasivan, 2010), "TAM" (Olson and Boyer, 2003; Kamarulzaman et al., 2013; Ramkumar and Jenamani, 2015; Brandon-Jones and Kauppi, 2018), theory "TOE" (Teo, et al., 2009; dua et al., 2012; Ramdani et al., 2013). Some authors use various theories in combination, such as "IT" and "TCT" (Son and Benbasat, 2007), "RBV" together with "DCT" (Vaidyanathan and Devaraj, 2008), TAM with "TPB" (Gamal Aboelmaged, 2010), TAM, TPB and "DOI" (Gumussoy and Calisir, 2009), TAM, DOI and TOE (Alomar and de Visscher, 2017), TAM, RBV and DCT (Rakumar et al., 2019) and TOE and RBV (Misra et al., 2007). In addition, nearly 20 studies have used the researcher-developed model (RDM) which consists of various constructs mainly derived from the existing literature.

In general, of 38 documents that describe the theory or model that researchers always use, there is a theory or model from Technology Acceptance Model (TAM) and TOE. This theory is used because TAM provides a theoretical basis for knowing the factors that influence the acceptance of a technology in an organization. TAM aims to explain and predict user acceptance of an information system. TAM provides a theoretical basis for knowing the factors that influence the acceptance of a technology in an organization. TAM explains the causal relationship between beliefs (the benefits of an information system and ease of use) and the behavior, goals/ needs, and actual use of users/users of an information system.

DISCUSSION

Facilitating the Internet in business-to-business transactions The Internet is considered the dominant facilitation technology for e-commerce by many academics and practitioners. E-Procurement is a form of transaction that uses the internet in the process of procuring goods. Research on E-Procurement has been carried out in several developing countries. Contradiction related to the implementation of E-Procurement is one of the topics which until now is still being used as a topic of research. The various benefits offered from the adoption of E-Procurement itself cannot be measured optimally because they are both quantitative (eg efficiency savings) and qualitative (eg increased transparency, control, etc.). In several countries it was found that the majority of respondents using e-procurement technology were relatively new to e-procurement, only 34 percent had been involved in initiatives related to e-procurement technology for one year or more. The low adoption rate has also limited e-procurement technology users from leveraging the capabilities associated with their suppliers. Users of e-procurement technology report that they can source goods via the Internet from only 15 percent of their supply base.

The results of the study show that some developed countries such as the US have adopted e-procurement, where the adoption process is mostly in non-profit organizations, this is according to research conducted by (Davila et al., 2004) in his research he also explained that an entity would adopt E-Procurement because it had considerable advantages from implementing the technology and in his research he also emphasized that overall adoption in each sector can be carried out immediately by means of an entity that has adopted E-Procurement is willing to share experiences positively related to the use or adoption of a technology system and its business risks.

The process of adopting E-Procurement itself in developed countries has not yet fully adopted the technology system, this is due to a lot of contrasts that have occurred, among others, due to a set of promising technologies that have not yet resolved how each set will meet the needs of various market segments, or which design is dominant. which will direct the technologies for their rapid adoption. In addition, there are certain risks associated with implementing e-procurement technology that need to be addressed before this technology becomes widely accepted. This study also found the main functions of adopting E-Procurement in an entity, namely the Catalogue, Repository and Content Management functions, making it easier to submit requests for offers, requests for information or requests for proposals to suppliers, workflow, system integration.

Some of the factors found in the adoption of E-Procurement are organizational factors, readiness, supply, strategy, policy, development strategy, supplier adoption, conformity to best practices for business cases, system integration, procurement process rearrangement, implementation strategy, technology standards, and legal compliance. In the several documents that make up this review, we found that there were differences in each country in the process of adopting E-Procurement where the most dominant factor was related to the factor of usefulness, use and value of E-Procurement itself.

Apart from the factors described above, there were also several other factors, namely internal organization, integration with supplier electronic systems, supplier willingness, perceived increase in transactions and supplier pressure. However, the main supplier's willingness factor and future intention to transact online are the driving forces influencing buyer's intention to use e-procurement. The analysis shows that the research was conducted using different theoretical frameworks, with a relatively small sample size (on average). N =260) collected from various countries. In addition, it largely relies on the "TAM," the "TOE framework" and its extensions to describe the adoption and intended use of EPs.

The research findings show that in general the strategy used by some organizations to adopt their E-Procurement is by using a wait and see approach. Companies are generally aware of technological developments related to E-Procurement, but do not resource or invest selectively until the best e-procurement model can be identified. In general, these companies think that the presence of these technological developments does not provide more benefits for diverting the procurement process which they believe is good or well-established compared to using electronic procurement or known as E-Procurement. Several companies found in this literature review will adopt E-Procurement over the next 12 months after seeing the development of the company and the need for this technology

CONCLUSION

Guidance of companies in adopting E-Procurement in this literature review found that companies in several developing countries still have high concerns about the adoption of e-procurement, the risks that we found in this study are first internal business risks: companies are not sure about whether they have the right resources to successfully implement an e-procurement solution. Experimenting with companies following a 'wait and see' strategy can help develop the necessary absorption capacities. Implementing an e-procurement solution requires not only the system itself successfully carrying out the purchasing process, but most importantly, integrating with the existing information infrastructure. This internal information infrastructure includes systems such as accounting, human resources, asset management, inventory management, accounts payable, production planning, and cash management systems. Most organizations that are adopting or looking to adopt e-procurement software already have significant investments in these other systems; integrating this new technology with existing platforms should happen as seamlessly as possible. Failure to integrate creates duplicate work steps and compromises the reliability of organizational information. Second, technology risk: companies also fear the lack of widely accepted standards and a clear understanding of which e-procurement

technologies best suit individual company needs. The lack of a widely accepted solution hinders the integration of different e-procurement software across the supply chain. The significance of these risk factors seems to suggest the need for clear and open standards that will facilitate inter-organizational e-procurement of technology. Without widely accepted coding standards, technical and process specifications, e-procurement technology adoption will be slow and will fail to deliver many of the expected benefits and lastly the third. Risks of the e-procurement process: another set of risks related to the security and control of the e-procurement process itself. Organizations must be sure, for example, that unauthorized actions will not disrupt production or other supply chain activities when committed to e-procurement technologies.

These results reinforce the view that there has been a shift in attitudes towards the use of electronic systems in the procurement process, and this could be suggested due to the decline in overall business expectations following the burst of the Internet bubble. Such changes in attitudes and expectations are to be expected given the volatile market created by the rapid developments taking place in the information industry. This research has several limitations. The limited number of documents that can be used as a literature review, this is due to access difficulties in finding and downloading documents. This study is also limited to organizations within large and complex confederation networks, which may limit generalizability. However, these findings may have significance in the public sector and the private sector.

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