


IDENTIFYING BARRIERS IN PUBLIC SECTOR DIGITAL TRANSFORMATION: A CASE STUDY IN INDONESIA CITY OFFICE FOR POPULATION ADMINISTRATION AND CIVIL REGISTRATION (COPACR) CONTEXT

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ARTICLE INFO	ABSTRACT
<p>Article history: Received: December, 02nd 2023 Accepted: March, 11th 2024</p>	<p>Purpose: This paper presents a case study of the Surabaya City Office for Population Administration and Civil Registration (COPACR), which is currently undergoing digitization and digital transformation across all its civil registration service lines. This research identifies internal and external barriers relevant to digital transformation in the context of Surabaya COPACR.</p>
<p>Keywords: COPACR; Digital Transformation; External Barrier; Internal Barrier; Public Sector.</p>	<p>Theoretical Framework: This study combines qualitative and quantitative methods to identify internal and external barriers relevant to the implementation of digital transformation in the COPACR sector. The barriers are validated through Focus Group Discussions (FGDs) applying the Analytic Hierarchy Process (AHP) and Expert Choice tools. Priority barriers are determined based on the highest relevance weight values from the perspectives of Top Management and Field Officers.</p>
	<p>Design/Methodology/Approach: This research adopts an action research methodology, leveraging the researcher's position within the system to directly intervene and facilitate change. A mixed-method approach is employed, combining qualitative and quantitative methodologies. Twenty literature sources are utilized to identify internal and external barriers within public sectors to adopt digital transformation. A total of 63 barriers (33 internal and 30 external) are categorized and their relevance tested through Focus Group Discussions (FGDs). Barrier priorities are selected using the Analytic Hierarchy Process (AHP) method and expert choice tools.</p>
	<p>Findings: The Surabaya COPACR in developing countries exhibits characteristics such as low employee motivation, inadequate officer competency, rigid bureaucratic structures, and limited innovation. With these conditions, the internal priorities for adopting digital transformation in Surabaya COPACR include lack of political support, traditional bureaucracy, organizational complexity, and lack of competency. External barriers include inflexible regulations, bureaucracy, lack of data standardization, and inadequate funding allocation.</p>
	<p>Research, Practical & Social Implications: This research contributes theoretical insights into internal and external priority barriers that need to be considered to adopt digital transformation in the COPACR context of developing countries. The identified barriers can serve as references for public sectors with similar organizational characteristics in developing countries to design strategies for adopting digital transformation effectively.</p>
	<p>Originality/Value: This study identifies internal and external barriers to digital transformation in the Surabaya COPACR context, involving assessments from both strategic (Top Management) and technical (Field Officer) perspectives.</p> <p>Doi: https://doi.org/10.26668/businessreview/2024.v9i4.4500</p>

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IDENTIFICAÇÃO DE BARREIRAS NA TRANSFORMAÇÃO DIGITAL DO SETOR PÚBLICO: UM ESTUDO DE CASO NO CONTEXTO DO ESCRITÓRIO DA CIDADE DE SURABAYA PARA ADMINISTRAÇÃO POPULACIONAL E REGISTRO CIVIL (COPACR) DA INDONÉSIA

RESUMO

Objetivo: Este artigo apresenta um estudo de caso do Escritório da Cidade de Surabaya para Administração Populacional e Registro Civil (COPACR), que está atualmente passando por digitalização e transformação digital em todas as suas linhas de serviço de registro civil. Esta pesquisa identifica as barreiras internas e externas relevantes para a transformação digital no contexto do COPACR de Surabaya.

Referencial Teórico: Este estudo combina métodos qualitativos e quantitativos para identificar as barreiras internas e externas relevantes para a implementação da transformação digital no setor COPACR. As barreiras são validadas por meio de Discussões em Grupo Focal (DGFs) aplicando o Processo Analítico Hierárquico (PAH) e ferramentas de Escolha de Especialistas. As barreiras prioritárias são determinadas com base nos maiores valores de peso de relevância das perspectivas da Alta Administração e dos Funcionários de Campo.

Desenho/Metodologia/Abordagem: Esta pesquisa adota uma metodologia de pesquisa-ação, aproveitando a posição do pesquisador dentro do sistema para intervir diretamente e facilitar a mudança. É empregada uma abordagem mista, combinando metodologias qualitativas e quantitativas. Vinte fontes de literatura são utilizadas para identificar as barreiras internas e externas dentro dos setores públicos para adotar a transformação digital. Um total de 63 barreiras (33 internas e 30 externas) são categorizadas e sua relevância testada por meio de Discussões em Grupo Focal (DGFs). As prioridades das barreiras são selecionadas usando o método do Processo Analítico Hierárquico (PAH) e ferramentas de escolha de especialistas.

Resultados: O COPACR de Surabaya em países em desenvolvimento exibe características como baixa motivação dos funcionários, competência inadequada dos oficiais, estruturas burocráticas rígidas e inovação limitada. Com estas condições, as prioridades internas para a adoção da transformação digital no COPACR de Surabaya incluem falta de apoio político, burocracia tradicional, complexidade organizacional e falta de competência. As barreiras externas incluem regulamentações inflexíveis, burocracia, falta de padronização de dados e alocação inadequada de recursos financeiros.

Pesquisa, Implicações Práticas e Sociais: Esta pesquisa contribui com insights teóricos sobre as barreiras prioritárias internas e externas que precisam ser consideradas para adotar a transformação digital no contexto do COPACR em países em desenvolvimento. As barreiras identificadas podem servir como referências para setores públicos com características organizacionais semelhantes em países em desenvolvimento para projetar estratégias para adotar a transformação digital de forma eficaz.

Originalidade/Valor: Este estudo identifica as barreiras internas e externas à transformação digital no contexto do COPACR de Surabaya, envolvendo avaliações tanto de perspectivas estratégicas (Alta Administração) quanto técnicas (Funcionário de Campo).

Palavras-chave: COPACR, Transformação Digital, Barreira Externa, Barreira Interna, Setor Público.

IDENTIFICACIÓN DE BARRERAS EN LA TRANSFORMACIÓN DIGITAL DEL SECTOR PÚBLICO: UN ESTUDIO DE CASO EN LA OFICINA DE POBLACIÓN Y REGISTRO CIVIL DE LA CIUDAD DE SURABAYA, INDONESIA (COPACR)

RESUMEN

Propósito: Este artículo presenta un estudio de caso de la Oficina de Población y Registro Civil de la Ciudad de Surabaya (COPACR), que actualmente está llevando a cabo la digitalización y transformación digital en todas sus líneas de servicios de registro civil. Esta investigación identifica las barreras internas y externas relevantes para la transformación digital en el contexto de Surabaya COPACR.

Marco Teórico: Este estudio combina métodos cualitativos y cuantitativos para identificar las barreras internas y externas relevantes para la implementación de la transformación digital en el sector COPACR. Las barreras se validan a través de Discusiones de Grupo de Enfoque (FGDs) aplicando el Proceso Analítico Jerárquico (AHP) y herramientas de Elección de Expertos. Las barreras prioritarias se determinan en función de los valores de peso de relevancia más altos desde las perspectivas de la Alta Dirección y los Oficiales de Campo.

Diseño/Metodología/Enfoque: Esta investigación adopta una metodología de investigación-acción, aprovechando la posición del investigador dentro del sistema para intervenir directamente y facilitar el cambio. Se emplea un enfoque mixto, combinando metodologías cualitativas y cuantitativas. Se utilizan veinte fuentes de literatura para identificar las barreras internas y externas dentro de los sectores públicos para adoptar la transformación digital. Un total de 63 barreras (33 internas y 30 externas) se categorizan y su relevancia se prueba a través de Discusiones de Grupo de Enfoque (FGDs). Las prioridades de las barreras se seleccionan utilizando el método del Proceso Analítico Jerárquico (AHP) y herramientas de elección de expertos.

Hallazgos: El COPACR de Surabaya en países en desarrollo presenta características como baja motivación de los empleados, competencia insuficiente de los oficiales, estructuras burocráticas rígidas y limitada innovación. Con estas condiciones, las prioridades internas para adoptar la transformación digital en Surabaya COPACR incluyen la falta de apoyo político, burocracia tradicional, complejidad organizativa y falta de competencia. Las barreras externas incluyen regulaciones inflexibles, burocracia, falta de estandarización de datos y asignación de fondos insuficiente.

Implicaciones de la Investigación, Prácticas y Sociales: Esta investigación contribuye a aportar conocimientos teóricos sobre las barreras prioritarias internas y externas que deben tenerse en cuenta para adoptar la transformación digital en el contexto de COPACR de países en desarrollo. Las barreras identificadas pueden servir como referencias para los sectores públicos con características organizativas similares en países en desarrollo para diseñar estrategias para adoptar la transformación digital de manera efectiva.

Originalidad/Valor: Este estudio identifica barreras internas y externas para la transformación digital en el contexto de COPACR de Surabaya, involucrando evaluaciones desde perspectivas tanto estratégicas (Alta Dirección) como técnicas (Oficial de Campo).

Palabras clave: COPACR, Transformación Digital, Barrera Externa, Barrera Interna, Sector Público.

1 INTRODUCTION

Various sectors are presently in the midst of digital transformation. This trend is driven by the need to adapt to a rapidly shifting digital landscape, further accelerated by the COVID-19 pandemic. Among these sectors is the government, which is actively pursuing digitalization efforts within the public sector. Indonesia's government has implemented several initiatives to address the digital shift. In 2019, Indonesia's Ministry of Internal Affairs launched the "DUKCAPIL GO DIGITAL" program, mandating City Offices of Public Administration and Civil Registration (COPACR) nationwide to provide digital services to citizens. This initiative encourages COPACR to issue population documents digitally, enabling citizens to independently print documents as required. Furthermore, in 2022, the Indonesian government introduced the "Digital Administration Services in The Palm of Hand" program as the next step in the digital transformation for public services. This program streamlines service processes and population data management across Indonesia, including Surabaya, through the centralized SIAK system on the national server, treating population data as Big Data.

Digital transformation typically progresses through three phases: digitization, digitalization, and digital transformation (Verhoef et al., 2021). Existing literature suggests that the initial two phases, involving more incremental changes, are prerequisites for achieving comprehensive digital transformation. Surabaya, Indonesia's second-largest city with a population of 3,157,136, has garnered acclaim for its progressive improvements across various domains. It has attained accolades for the COPACR's exceptional performance in digital services for population and civil registration. The digitization phase in Surabaya has already occurred, notably evident by the

transition from analog and physical processes to an online platform, called e-Lampid, in 2016. Meanwhile, digitalization involves leveraging information technology to enhance existing business processes (Li et al., 2016), as demonstrated by the implementation of the "KLAMPID" application in Surabaya. This mobile-based online communication channel facilitates improved connectivity between citizens and Surabaya COPACR.

Despite the government's efforts, the current digital ecosystem in Surabaya appears insufficient to fully embrace digital transformation beyond the initial phases. Digital transformation in the public sector, which involves utilizing technology for policymaking and service delivery, utilizing Big Data (Wahfianka, 2022), remains largely unimplemented. To proactively address potential barriers, organizations must identify and mitigate them. However, no existing research has specifically examined the barriers to digital transformation in public services, especially in organizations like COPACR that serve the entire population of specific regions. There is an opportunity to explore how public institutions can collaboratively undergo transformation (Bjerke-Busch & Aspelund, Identifying Barriers for Digital Transformation in the Public Sector, 2021). Consequently, this study was conducted to identify impediments to implementing digital transformation in Surabaya COPACR, with the aim of expanding service provision across institutions to the broader community.

2 LITERATURE REVIEW

Digital Transformation (DT) represents a holistic initiative directed towards transitioning an organization's processes and services from analog to digital realms. At its core, DT is centered on meeting user needs, introducing innovative service delivery models, and broadening the user base (Mergel et al., 2019). While often used interchangeably, "Digitization" and "Digitalization" represent distinct concepts despite their close association with DT. Digitization involves converting analog data into a digital format (i.e., zeros and ones) to enable storage, processing, and transmission by computers (Dougherty & Dunne, 2011; Loebbecke & Picot, 2015). Additionally, research refers to digitization as the transition from analog to digital tasks (Li, Nuccirelli et al., 2016; Sebastian, et al., 2017). On the other hand, Digitalization entails leveraging Information Technology (IT) or digital technologies to modify existing business processes (Li et al., 2016) serves as a crucial enabler in digitalization, facilitating the exploration of new business opportunities through process modifications such as communication, distribution, or business relationship management (Ramaswamy & Ozcan,

2016; Leviäkangas, 2016). For instance, creating new online or mobile communication channels to streamline customer-firm interactions (Ramaswamy & Ozcan, 2016). Through digitalization, businesses optimize existing processes to enhance coordination and user experiences, ultimately generating additional customer value (Pagani & Pardo, 2017).

DT introduces a novel business model aimed at creating and capturing value through the implementation of a new business logic (Pagani & Pardo, 2017; Li et al., 2017) or value creation process (Gölzer & Fritzsche, 2017). It represents a company-wide phenomenon with extensive organizational implications (Iansiti & Lakhani, 2014), impacting the entire organization and its practices (Amit & Zott, 2001). The scope of DT design broadly encompasses digital activities at the customer interface or entirely on the customer side, such as digital technologies embedded in end-user products (Matt et al., 2015). DT strategies aim to transform products, processes, and organizational aspects by introducing new technologies. Organizations strive to redesign their processes, establish new stakeholder collaboration methods, and foster new forms of interaction with increasingly informed and demanding citizens (Sebastian, et al., 2017).

In the public sector literature, changes in service delivery are predominantly examined under the term "e-government." Digital Government, e-government, and e-government are synonymous terms denoting information and communication technology utilization in government agencies (Gottschalk, 2009). DT in the public sector is increasingly necessary and strategically imperative for governments worldwide due to the rapid evolution of disruptive digital technologies reshaping society and daily life (Liva et al., 2020). However, e-government focuses on the government's use of information technology and the transformation of governance through information technology (Meijer, E-governance innovation: Barriers and strategies, 2015). E-government projects in developing nations involve information, technology, and political issues (Gunawong & Gao, 2017). Thus, digital transformation has emerged as one of the most promising trends of recent decades.

Despite high expectations, digital transformation in the public sector remains in its nascent stages, necessitating more evidence on how governments and public organizations approach DT. While innovation barriers, in general, have been extensively studied, research on digital transformation in the public sector has been limited and fragmented. Public sector organizations can evaluate their digital transformation implementation as a success, partial failure, or complete failure (Heeks, 2003). Success occurs when the organization achieves its transformation goals with minimal unintended consequences. Partial failure arises when intended goals are not met or lead to undesirable outcomes. Total failure occurs when foundational systems of digital transformation are either not implemented or underutilized

(Syed et al., 2022). Barriers represent real or perceived characteristics of the legal, social, technological, or institutional context that hinder digital transformation efforts by impeding access to information, people, and services facilitated by ICTs (Meijer, E-governance innovation: Barriers and strategies, 2015). This study aims to identify internal and external barriers to implementing DT in the public sector, particularly within government organizations.

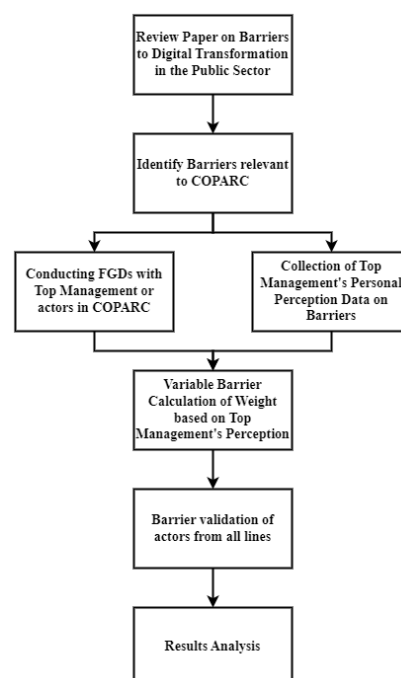
3 RESEARCH METHOD AND DATA COLLECTION

This study aimed to contribute to the growing body of research on digitalization, particularly within the public service sector. Its objective was to comprehend the concept of digital transformation in the service sector and identify obstacles hindering its full realization within the public sector. The research focused on tracking the process of public services for population administration in Surabaya COPACR, conducting a case study.

A mixed-method approach was employed in this study, combining qualitative and quantitative methodologies to generate more comprehensive results (George, 2022). Through data collection, analysis, and the integration of quantitative and qualitative data, the study developed questionnaire instruments to collect valid primary data (Bjerke-Busch & Aspelund, 2021). The flowchart depicting the methodology of this study is presented in Figure 1.

Figure 1

Research Flowchart



This paper begins with a comprehensive literature review examining digital transformation and its associated barriers across various public sectors. The methodology involves reviewing ten relevant literature sources, and synthesizing findings and conclusions (Polit & Hungler in Carnwell, 2001). Subsequently, the literature review outcomes are utilized to identify barriers relevant to the public service sector in Indonesia, particularly within the context of COPACR Surabaya City's digital transformation efforts. This identification process was executed through a Forum Group Discussion (FGD) involving eight key stakeholders in Upper management roles, comprising: (1) Deputy Head of Surabaya COPACR; (2) Head of Civil Registration Department; (3) Head of Population Registration Department; (4) Head of Information and Technologies Department; (5) Head of Innovation Department; (6) Section Chief at Innovation Department; (7) Chief of Staff at Information and Technologies Department; (8) Section Chief of Secretariat. The selection of participants was based on their performance metrics, tenure, and involvement in digital transformation innovation initiatives. The FGD aimed to solicit proposed barriers encountered by employees during the implementation of digital transformation in their daily tasks.

Following the collection of barriers from both the literature review and FGD, further deliberation is conducted regarding the weighting of these barriers using the Analytic Hierarchy Process (AHP) method and expert choice tools. AHP is chosen due to its utility as a decision-support model featuring a functional hierarchy, with human perception serving as the primary input (Handayani, 2015).

Additionally, the weighting process involved assessing the eight upper management stakeholders based on predetermined criteria such as tenure, competence, and position level, as determined by expert consensus. Upon completing the weighting procedure, the personal perspective of each stakeholder regarding these obstacles were elicited using a Likert scale ranging from 1 to 4, where 1 indicated strong disagreement and 4 signified strong agreement. The resultant weighting and perception data were then amalgamated with the weights of stakeholder and barrier variables to discern the primary obstacles.

Subsequently, the validation of identified barriers, based on the perceptions of each upper management stakeholder, was undertaken by administering a Likert scale questionnaire ranging from 1 to 4 to operational employees involved in service implementation under COPACR, as well as government actors directly engaged in population administration services. Operational actors included Section heads of department at Surabaya COPACR (6), Surabaya

COPACR staff (4), Village Heads of Neighborhood (3), Heads of Community Associations (4), Head of Subdistrict (5), and Surabaya COPACR Validator Operators (3).

Before computing the weight of obstacles, operational employees were evaluated based on their role in digital transformation innovation at COPACR Surabaya City, utilizing expert choices. Subsequently, their perceptions of barriers were assessed by analyzing the weighting of employee variables and obstacles. The resultant calculations for both variables were then juxtaposed to compare the perceptions of operational employees with those of top management stakeholders.

4 RESULTS AND DISCUSSION

The process of identifying barriers to digital transformation within the City Office for Population Administration and Civil Registration (COPACR) in the Indonesian context follows a structured approach comprising five stages: 1) Conducting a comprehensive literature review on both internal and external barriers prevalent in public sectors, 2) Evaluating the relevance of identified barriers through focus group discussions with upper management of COPACR, 3) Assessing the perspective of field officers within COPACR through additional focus group discussions, 4) Determining the priority of internal and external barriers specific to the Indonesian context within COPACR, and 5) Summarizing key findings and lessons derived from the research process. This research adopts an action research methodology, leveraging the researcher's position within the system to directly intervene and facilitate change.

4.1 LITERATURE REVIEW TERKAIT INTERNAL AND EXTERNAL BARRIER IN PUBLIC SERVICE SECTORS

This study draws from a comprehensive review of 20 literature sources to identify internal and external barriers within public service sectors, totaling 63 barriers to digital transformation. These barriers, consisting of 33 internal and 30 external factors, have been categorized based on contextual similarities. Internally, challenges within public service sectors include organizational complexity (Bjerke-Busch & Aspelund, 2021; Nachit et al., 2021), officers' competency gaps (Jakob & Krcmar, 2018), insufficient political and managerial support, low appreciation of job performance (Gupta, 2018), inadequate managerial support (Andersson & Mattsson, 2018; Nachit et al., 2021), entrenched bureaucratic cultures (Aminah

& Saksono, 2021; Andersson & Mattsson, 2018; Hafselde et al., 2021), conflicts of personal interests (Torfing et al., 2016), budgetary constraints on IT infrastructure investment (Hafselde et al., 2021), and issues regarding workforce motivation. Externally, barriers to digital transformation are linked to inflexible regulations (Andersson & Mattsson, 2018; Bjerke-Busch & Aspelund, 2021), rigid employee recruitment processes (Bjerke-Busch & Aspelund, 2021), inadequate government support for e-government initiatives (Aminah & Saksono, 2021; Bjerke-Busch & Aspelund, 2021; Jakob & Krcmar, 2018; Nachit et al., 2021), complex funding procedures (Bjerke-Busch & Aspelund, 2021; Hafselde et al., 2021), absence of standardized work culture (Hafselde et al., 2021; Torfing et al., 2016), political issues (Hafselde et al., 2021), privacy concerns hindering data integration (Aminah & Saksono, 2021), societal dependence on offline systems (Sayabek et al., 2020), and inadequate IT services or infrastructure (Sayabek et al., 2020). The study aims to evaluate the relevance of these 63 digital transformation barriers within the specific context of the City Office for Population Administration and Civil Registration (COPACR) in developing countries, particularly Indonesia.

4.2 ASSESSMENT OF INTERNAL AND EXTERNAL BARRIER RELEVANCE THROUGH FOCUS GROUP DISCUSSIONS BASED ON THE PERSPECTIVES OF TOP COPACR MANAGEMENT

The evaluation of internal and external digital transformation barriers within the City Office for Population Administration and Civil Registration (COPACR) is conducted through Focus Group Discussions, with insights drawn from the perspectives of Top COPACR management. Surabaya City COPACR serves as the focal point for this research, chosen for its prominence as the second-largest city in Indonesia, boasting a population of 3,157,136 individuals, and recognized for its progressive strides in various domains particularly digital transformation in civil registration. For this study, eight upper managers from different divisions in Surabaya COPACR were invited. Each manager's input carries varying weight (Table 1) determined by factors such as work experience (20%), competency (60%), and position level (20%). Consequently, Manager 6 holds the highest weight (0.232, Rank 1) for assessing the relevance of digital transformation barriers in the Indonesian COPACR context.

Table 1*Top COPACR Management Invited to Focus Group Discussion (FGD)*

Participants	Tenure* 20%	Competence 60%	Position Level 20%	Score	Weight	Rank
Manager 1	271	3	3	56.6	0.196	2
Manager 2	51	2	2	11.8	0.041	8
Manager 3	147	3	3	31.8	0.110	4
Manager 4	182	1	1	37.2	0.129	3
Manager 5	110	2	3	23.8	0.082	7
Manager 6	326	2	3	67.0	0.232	1
Manager 7	144	3	3	31.2	0.108	5
Manager 8	144	1	2	29.8	0.103	6

*Length of Work = Length Total of Service x 12 Months

The Focus Group Discussion (FGD) was assisted using the Expert Choice software to assess the relevance of each internal and external barrier within the context of COPACR systems in Indonesia. Through input collected from Top COPACR management 17 internal and 14 external barriers were identified as relevant. An additional six internal and four external barriers specific to the Indonesian COPACR context were pinpointed after the FGD, referenced in table Table 2.

Table 2*Additional Internal and External Barriers from FGD Phase 1 Result*

No	Category	Name of Barrier
1	Internal	Divergence in comprehension of HR capabilities and knowledge within the realm of technology.
2		Constrained resources and infrastructure for fostering innovation.
3		Restricted financial resources allocated for innovation development.
4		Prolonged verification stages leading to issuance of outdated documents.
5		Diverse requirements within the population administration process.
6		Incomplete digitization of citizen population data.
7		Limited accessibility to the central population database.
8	External	Inadequate public awareness regarding technological innovations.
9		Instances of cyber attacks.
10		Top management policies vulnerable to sustainability issues.

The initial phase of the Focus Group Discussion (FGD) involving Top COPACR Management Assessment resulted in 23 selected internal barriers corresponding to the digital transformation of civil registration. The top five internal barriers identified are insufficient managerial support (9.32%), inadequate political support (8.42%), complex bureaucracy and

ineffective decision-making (7.06%), organizational complexity (7.04%), and low resource competency (6.68%). The percentage values for each barrier were calculated by multiplying the Weight of the Barrier by the Manager's Assessment, referenced in Table 1. The relevance of all internal barriers will be reassessed by the Field COPACR Officer, acting as the technical team responsible for the business process implementation.

Table 3

Internal barriers Relevant to the Context of Indonesia's COPACR

No	Internal Barriers	Weight	Sum*	Percentage	Rank Priority
1	The lack of political support	0.081	0.25	8.42%	2
2	Insufficient managerial support	0.076	0.28	9.32%	1
3	The presence of organizational complexity	0.074	0.21	7.04%	4
4	The persistence of a conventional bureaucratic culture devoid of ICT integration.	0.071	0.19	6.29%	6
5	Ineffective decision-making processes	0.067	0.21	7.06%	3
6	Insufficient coordination among employees and departments within the organization	0.064	0.17	5.77%	8
7	Human resource allocation issues (lack of competence)	0.061	0.20	6.68%	5
8	Limited availability of employees with proficient ICT skills	0.057	0.18	6.00%	7
9	Inadequate staffing levels to drive innovation and change	0.054	0.17	5.60%	9
10	Immaturity of projects or innovations to be developed	0.050	0.16	5.40%	10
11	A culture among employees of reluctance to learn and adapt to changes	0.047	0.13	4.49%	11
12	Weak regulations regarding human resource allocation	0.043	0.12	4.09%	12
13	Not all population data have been digitized**	0.040	0.04	1.26%	21
14	Diverse needs for population administration processes are excessive**	0.037	0.02	0.70%	22
15	Document verification stages require lengthy periods**	0.034	0.02	0.61%	23
16	Lack of innovation enthusiasm due to fears of technology replacing workers	0.031	0.10	3.21%	14
17	Internal organizational resistance to change	0.027	0.09	3.18%	15
18	Performance measurement systems for employees that are still non-standardized	0.023	0.10	3.48%	13
19	Insufficient recognition and incentives for hardworking employees	0.020	0.09	2.88%	16
20	A work culture in the organization that prioritizes individual departments**	0.017	0.08	2.61%	17
21	Lack of interest in creating and implementing innovations	0.013	0.06	2.04%	18
22	Conceptual language differences between IT fields, managers, and laborers**	0.007	0.06	1.96%	19
23	Inadequate technological facilities (system errors beyond control)**	0.006	0.06	1.91%	20

Notes: *Weight of Barrier x Weight of Participants x Manager's Assessment; ** Additional Internal and External Barriers from FGD Phase 1 Result

A total of 18 external barriers are deemed relevant to the Indonesian COPACR context regarding digital transformation in civil registration. Through Top COPACR management assessment, the top five external barriers identified are inflexible government regulations (11.95%), adherence to rigid regulations (10.78%), lack of standardization in data processing and inter-organizational data storage (9.92%), inflexible budget allocation (8.62%), and non-streamlined organizations (6.83%). All external barriers are reassessed by the technical team responsible for the business process.

Table 4

External barriers Relevant to the Context of Indonesia's COPACR

No	External Barriers	Weight	Sum*	Percentage	Rank Priority
1	Inflexible external regulations	0.101	0.36	11.95%	1
2	Bureaucratic external regulations that remain rigid must be adhered to despite technological advancements	0.094	0.32	10.78%	2
3	Lack of standardization in data processing and storage among organizations**	0.092	0.30	9.92%	3
4	Funding allocation focuses on efficiency and cost savings rather than innovation investment	0.087	0.26	8.62%	4
5	Complexity of innovation funding processes	0.081	0.19	6.44%	7
6	Involvement of numerous organizations in collaborations (organizations are not streamlined)	0.076	0.20	6.83%	5
7	Insufficient communication among organizations	0.070	0.18	6.12%	8
8	Lack of standardized work culture among organizations	0.065	0.20	6.51%	6
9	Lack of confidence that innovation is adequate and effective	0.059	0.15	4.89%	10
10	Existence of societal gaps in technology adoption (offline options preference)	0.053	0.17	5.64%	9
11	Existence of societal gaps in accessing technology/internet education	0.048	0.14	4.62%	11
12	Existence of societal gaps in accessing technology/internet due to economic disparities	0.044	0.12	4.08%	12
13	Existence of societal gaps in accessing technology/internet based on age	0.036	0.10	3.47%	13
14	Difficulty in reaching out to the community to introduce technology**	0.030	0.08	2.71%	15
15	Need to demonstrate that innovation can yield greater efficiency	0.024	0.10	3.37%	14
16	Lack of anticipation regarding network/server security**	0.018	0.05	1.62%	16
17	Vulnerability of top management policies to unsustainability	0.013	0.05	1.59%	17
18	Discrepancies in network availability across regions	0.009	0.03	0.85%	18

Notes: *Weight of Barrier x Weight of Participants x Manager's Assessment; ** Additional Internal and External Barriers from FGD Phase 1 Result

4.3 ASSESSMENT OF INTERNAL AND EXTERNAL BARRIER RELEVANCE THROUGH FOCUS GROUP DISCUSSIONS BASED ON THE PERSPECTIVES OF FIELD COPACR OFFICERS

In Phase 1 of the Focus Group Discussion (FGD), the Top COPACR Management was involved in assessing the internal and external relevance of digital transformation barriers within the context of COPACR in Indonesia. Each participant represented a specific COPACR job role, namely Head of Field Section (Job 1), Head of Sub-District 1 (Job 2), Head of Sub-District 2 (Job 3), COPACR Staff (Job 4), Service Validator (Job 5), Head of Neighborhood (Job 6), Sub-District Registration Officer Assistant (Job 7), and Health Facility Officer (Job 8). Each job type was assigned respective scores based on the importance level of the role in the implementation of digital transformation, referred to in Table 5.

Table 5

Field COPACR Officer Invited to Focus Group Discussion (FGD)

Participants	Name of Job Role	Code	Score*	Weight
Field Officer 1	Head of Field Section	Job 1	9	0.167
Field Officer 2	Head of Sub-District 1	Job 2	8	0.148
Field Officer 3	Head of Sub-District 2	Job 3	7	0.130
Field Officer 4	COPACR Staff	Job 4	7	0.130
Field Officer 5	Service Validator	Job 5	7	0.130
Field Officer 6	Head of Neighborhood	Job 6	6	0.111
Field Officer 7	Sub-District Registration Officer Assistant	Job 7	5	0.093
Field Officer 8	Health Facility Officer	Job 8	5	0.093

*Evaluated based on the level of significance of the role in implementing digital transformation

The assessment of internal and external relevance barriers for the implementation of digital transformation in FGD Phase 2 involves the Field COPACR Officer with eight Job Roles. From a technical standpoint, assessments differ significantly from the strategic perspective of Top COPACR Management.

4.4 DETERMINATION OF PRIORITY INTERNAL AND EXTERNAL COPACR BARRIERS IN THE INDONESIAN CONTEXT

The prioritization of internal and external barriers involves a combination of assessments from both strategic perspectives (Top COPACR Management) and technical perspectives (Field COPACR Officer). Table 6 illustrates the final priority ranking of internal COPACR barriers for digital transformation. The adjusted weight calculation in the final result is derived from the Top COPACR Management assessment multiplied by 60% and added to the Field COPACR Assessment multiplied by 40%. For instance, for the internal barrier of insufficient political support, the final result of 0.114 is obtained from 0.084 multiplied by 60% (Top COPACR Management Assessment) plus 0.158 multiplied by 40% (Field COPACR Officer Assessment).

Table 1

Internal Barriers Priorities

No	Internal Barriers	Top Management Assessment (60%)		Field Officer Assessment (40%)		Final Result	
		Adj. Weight	Rank Priority	Adj. Weight	Rank Priority	Adj. Weight	Rank Priority
1	The lack of political support	0.084	1	0.158	1	0.114	1
2	The presence of a traditional bureaucratic culture not based on ICT	0.082	2	0.107	4	0.092	4
3	Organizational complexity	0.081	3	0.119	3	0.096	3
4	Allocation of human resources (lack of competency)	0.080	4	0.066	6	0.074	5
5	Insufficient availability of employees with proficient ICT skills	0.077	5	0.066	7	0.073	6
6	Inadequate managerial support	0.077	6	0.126	2	0.097	2
7	Ineffective decision-making processes	0.072	7	0.067	5	0.070	7
8	Lack of maturity in projects or innovations to be developed	0.068	8	0.045	10	0.059	10
9	Insufficient number of employees to implement innovations and changes	0.067	9	0.053	9	0.061	9
10	Lack of coordination among employees and departments within the organization	0.067	10	0.064	8	0.066	8
11	Existence of a culture among employees reluctant to learn and adapt to changes	0.061	11	0.039	11	0.052	11
12	Weak regulation in the allocation of human resources	0.054	12	0.032	12	0.045	12

No	Internal Barriers	Top Management Assessment (60%)		Field Officer Assessment (40%)		Final Result	
		Adj. Weight	Rank Priority	Adj. Weight	Rank Priority	Adj. Weight	Rank Priority
13	Not all population data have been digitized	0.051	13	0.025	13	0.041	13
14	Diverse needs for population administration processes are excessive	0.045	14	0.017	14	0.034	14
15	Document verification stages require lengthy processing times	0.034	15	0.013	15	0.026	15

*Weight of Barrier x Weight of Participants x Manager's Assessment

After considering assessments from both strategic and technical perspectives, a total of 15 internal barriers and 15 external barriers have been selected. The top 5 internal barriers relevant to digital transformation for civil registration within the context of Indonesia's Civil Online Public Access to Civil Registration (COPACR) are as follows: 1) Insufficient political support (0.114), 2) Lack of managerial support (0.097), 3) Organizational complexity (0.096), 4) Complex and non-ICT-based bureaucratic culture (0.092), and 5) Insufficient officer competence (0.074). Additionally, alongside internal barriers, the top five external barriers to digital transformation within the context of Indonesia's COPACR are identified as 1) Inflexible regulations (0.125), 2) Bureaucratic demands for service delivery (0.104), 3) Inflexible budget allocation (0.101), 4) Lack of data processing and storage standardization across organizations (0.099), and 5) Complex and inflexible funding process flows (0.090).

Table 2

External Barriers Priorities

No	External Barriers	Top Management Assessment (60%)		Field Officer Assessment (40%)		Final Result	
		Adj. Weight	Rank Priority	Adj. Weight	Rank Priority	Adj. Weight	Rank Priority
1	The inflexible external regulations	0.101	1	0.161	1	0.125	1
2	Bureaucratic external regulations that must be adhered to regardless of technological advancements	0.093	2	0.121	2	0.104	2
3	Lack of standardization in data processing and storage among organizations	0.091	3	0.11	4	0.099	4
4	Funding allocation focuses on efficiency and cost savings rather than innovation investment	0.088	4	0.121	3	0.101	3

No	External Barriers	Top Management Assessment (60%)		Field Officer Assessment (40%)		Final Result	
		Adj. Weight	Rank Priority	Adj. Weight	Rank Priority	Adj. Weight	Rank Priority
5	Complexity of the innovation funding process	0.085	5	0.098	5	0.090	5
6	Involvement of numerous organizations in collaborations (organizations not streamlined)	0.070	6	0.077	6	0.073	6
7	Insufficient communication among organizations	0.067	7	0.059	7	0.064	7
8	Lack of standardization in work culture among organizations	0.065	8	0.047	8	0.058	8
9	Public gap in technology adoption (preferring offline methods)	0.064	9	0.042	10	0.055	9
10	Public education gap in accessing technology/internet	0.058	10	0.036	11	0.049	10
11	Lack of confidence in the effectiveness of innovation	0.052	11	0.042	9	0.048	11
12	Economic gap in accessing technology/internet among the public	0.052	12	0.029	12	0.043	12
13	Need to demonstrate that innovation can yield greater efficiency	0.042	13	0.016	14	0.032	14
14	Age gap in accessing technology/internet among the public	0.042	14	0.024	13	0.035	13
15	Difficulty in reaching out to the public to introduce technology	0.031	15	0.015	15	0.025	15

4.5 KEY FINDING AND LESSON LEARNED

The success of digital transformation in the Public Sector Service, particularly within COPACR (City Office for Population Administration and Civil Registration), hinges on its ability to tackle internal and external barriers. In developing countries, COPACR exhibits unique characteristics such as low employee motivation, inadequate officer competency skills, suboptimal work ethic, rigid bureaucratic structures, limited adaptive leadership, and minimal innovation. This study examines internal and external barriers from strategic (Top COPACR Management) and technical (Field COPACR Officer) perspectives. The combination of assessments from these two perspectives validates the identified barriers crucial for consideration when implementing a technological system.

Globally, there are 33 internal barriers and 30 external barriers corresponding to digital transformation in the public sector. Surabaya City COPACR was chosen as the research subject due to its status as the second-largest city in Indonesia, boasting a population of 3,157,136

people, and its renowned progressiveness, especially in digital transformation within civil registration. Based on Focus Group Discussion results from the perspective of Top COPACR Management, 23 internal barriers and 18 external barriers relevant to the Indonesian context were identified. This research also delves into technical aspects from the perspective of Field COPACR Officers. In FGD Phase 2, 15 selected internal barriers and 15 selected external barriers corresponding to digital transformation were identified.

This study demonstrates that the implementation of digital transformation in civil registration processes in the Indonesian context is influenced by internal and external factors. Internally, political support and managerial guidance are pivotal, signifying that the execution of a digital transformation project is contingent upon the interests and policies of upper management. Moreover, the prevalence of traditional bureaucratic culture within COPACR internally complicates the organization's processes and causes prolonged procedures. Furthermore, this traditional culture has yet to recognize that Information and Communication Technologies (ICT) is imperative. Additionally, human resources exhibit low proficiency levels in adapting to new technologies. Besides internal factors, external factors also influence the success of digital transformation in developing nations. The governance system in developing countries, especially Indonesia, features rigid or inflexible regulations, impacting motivation and innovation actions due to numerous restrictions. Additionally, regulations and bureaucracy demand optimal performance from government organizations. Other external factors pertain to inflexible funding allocation and investment for infrastructure purposes, resulting in a convoluted and impeded innovation funding process.

The findings of this research regarding internal and external digital transformation barriers in the Indonesian COPACR context share characteristics similar to those in developing countries contexts. Therefore, addressing internal and external barriers should be the primary focus for governments to serve citizens. Thus, all strategies and action items aimed at realizing digital transformation in the COPACR sector must consider relevant internal and external barriers.

5 CONCLUSION

This study delves into the effectiveness of digital transformation within the Public Sector Service, particularly focusing on COPACR (City Office for Population Administration and Civil Registration), and its capacity to surmount internal and external barriers. Unique traits

of COPACR in developing countries, including low employee motivation, inadequate officer competency, rigid bureaucratic structures, and limited innovation, are accentuated. Through a comprehensive analysis from both strategic and technical perspectives, it is found that political support, managerial guidance, and organizational culture significantly influence digital transformation success internally, while inflexible regulations and funding constraints pose external challenges. The study underscores the necessity for governments to prioritize addressing these barriers to effectively serve citizens, emphasizing the importance of considering both internal and external factors in devising strategies for digital transformation in the COPACR sector.

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