JeDEM 18(2): 101-137, 2026
ISSN 2075-9517
http://www.jedem.org
Date of submission: 05.03.2026
Date of acceptance: 10.08.2026
Article DOI: 10.29379/jedem.v18i2.1234

Transparency Assessment Maturity in Open Government Data (TAM-OGD): a Hierarchical Decision Modeling Approach

Ratsuda Sakolkittinapakul

ORCID Nr: 0009-0003-0599-4796
Faculty of Engineering, Mahidol University, Thailand
ratsuda.sak@gmail.com

Sotarat Thammaboosadee

ORCID Nr: 0000-0003-4546-9665
Faculty of Engineering, Mahidol University, Thailand
sotarat.tha@mahidol.ac.th

Abstract: Despite national governments investing in open government data (OGD) to defend against corruption, the growth of OGD and the Corruption Perception Index are currently countering the situation. The inconsistent trend hinders the government agencies' achievement of the transparency performance in OGD. To facilitate the progress measurement of the organizational capabilities, this research employs a hierarchical decision modeling approach to introduce the Transparency Assessment Maturity in Open Government Data (TAM-OGD), which encompasses four dimensions: policy, dataset, portal, and accountability. Five maturity stages are represented by a desirability curve to determine the successful level. This model translates the theory of organizational transparency into practical implementation, serving as a tool for evaluating the public sector's transparency level in OGD through three case studies in Thailand. The evaluated results advocate an evidence-based tool for public sector executives to diagnose transparency weaknesses and offer strategic investments by allocating the limited resources to maximize organizational capabilities.

Keywords: open government data, transparency assessment, maturity model, hierarchy decision modeling, public sector.

Statement on the use of AI: To enhance readability and ensure grammatical accuracy, the authors utilized QuillBot during manuscript preparation. The authors take full responsibility for this manuscript's complete content.

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

1. Introduction

Transparency International, a global organization that promotes freedom of information, combats corruption, and advocates for transparency, announced a constant global average corruption perceptions index (CPI) of 43 since 2014 (Transparency International, 2024). The stable value highlights the existing corruption, primarily involving bribes to bureaucrats. Thus, this chronic problem poses a grave threat to the country's sustainable development, which is already declining (Attard et al., 2015). Interestingly, the digital transformation of the public sector effectively promotes openness and transparency (United Nations, 2024) by eliminating avenues for corruption (Dos Santos Brito et al., 2014). The abundance of public-sector information generated through digital processes provides insight into government operations and compliance with legal frameworks (Attard et al., 2015). Information is readily available to citizens through public dissemination, a concept known as open government data (OGD). It facilitates the defeat of misconduct behavior (Çaldağ & Gökalp, 2022) and increases transparency by reducing information asymmetry. Moreover, OGD eliminates the barrier between the government and citizens by ensuring the freedom of data quality and availability, allowing people to witness how an organization operates internally. The rise of productive management, accountability, trust, and engagement returns value to the organization and expands a beneficial society (Jamieson et al., 2019).

The CPI is statistically associated with the e-government development index (EGDI) (R-squared = 0.57, p-value < 0.0001), which demonstrates that public sector corruption directly affects a nation's capacity to deliver effective digital government services. EGDI reflects the facilitation of digital government services and encompasses the measurement of OGD performance at the national level (OGDI) (United Nations, 2024). Figure 1 presents the countercurrent growth of both values in many countries, such as El Salvador, Myanmar, Tajikistan, and Thailand (Transparency International, 2024; United Nations, 2024). These trends demonstrate an increase in corruption, whereas the continuous development of OGD across middle and high OGDI clusters is unable to elucidate organizational transparency. Laos and Malaysia indicate upward trends, indicating the coexistence of OGD quality and transparency. This positive correlation poses a challenge for the effective measurement of instruments and their readiness criteria in OGD ecosystems. Through CPI scores, the transparency aspect provides information about the country's corruption from 13 surveys (Transparency International, 2024). However, its results lack an explanation for operational improvement. While other e-government maturity models contain OGD evaluation as at minor part of digital service delivery, their progression captures the quantity dimension of successful dataset dissemination (Digital Government Development Agency, 2020), process redesign's readiness (Valdés et al., 2011), and preparation of information technology support (Amalia et al., 2024). Consequently, the threefold growth rate of OGD dissemination in the Thailand portal, which increased from 10,877 to 30,442 datasets in 2024 and 2025, overpasses the oversight layers of the OGD lifecycle, dataset utilization, and transparency circulation. The broad milestones embedded in e-government mandates fail to account for the critical institutional reality of OGD utility. The public sector satisfies compliance metrics by generating an environment of information overload, which decreases the monitoring of operational performance and maintains workforce capabilities (Roetzel & Fehrenbacher, 2019). Consequently, this OGD obesity is unable to reveal government transparency, with lacking organizational capability of both user comprehension and wide usability.

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

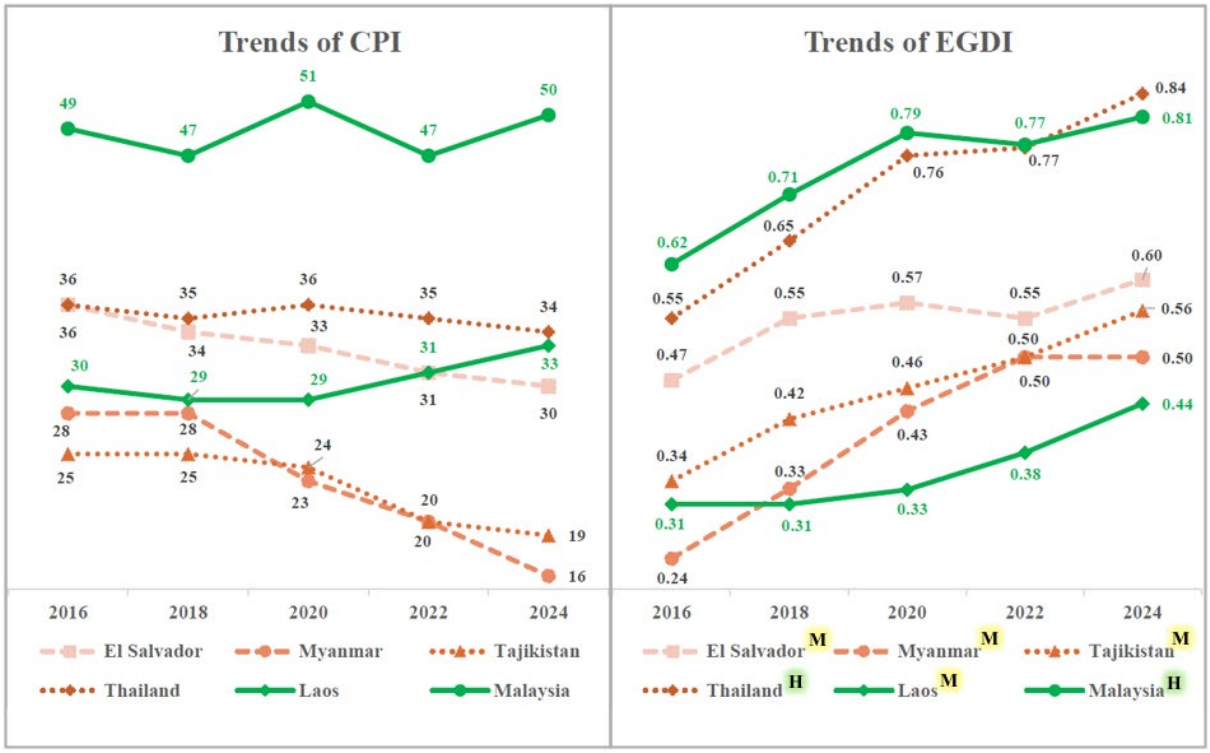
Accordingly, existing standard tools provide a useful measure of OGD maturity, which places emphasis on the evaluation of data availability or technology readiness. However, these previous models are deficient assessment criteria for the integrity of organizational capability, transparency mechanisms, and diagnostic improvement through OGD implementation. Therefore, the absence of practical tools to enforce transparency mechanisms within OGD motivates the following research question:

Which organizational capabilities are required to approach the transparency assessment for open government data?

To address these issues, this study aims to develop transparency assessment maturity in open government data (TAM-OGD). The specific model proposes a practical tool that translates the transparency mechanism in OGD to its performance measurement, along with focus areas, capturing indispensable elements for the exposure of organizational behaviors for OGD implementation. In addition to bridging theoretical compliance and operationalized execution, the novelty of this model transcends binary results to diagnostic outputs, indicating a descriptive analysis of the current agency's capabilities, a prescriptive analysis for weakness improvement, and a comparative analysis through organizational benchmarking (Adrodegari & Saccani, 2020). Interestingly, the Digitalization of Public Administration and Services Delivery Act (B.E. 2562) and additional regulations encourage OGD dissemination in Thailand with high OGDI. However, the explicitly wide gap between CPI and OGD performance contributes to listing Thailand as a practical case for this maturity model development. This progressive path provides a basis for cross-country validation to the public sectors at the departmental level and can be scaled up into a policy design tool. Its impacts provide an evidence base for long-term organizational strategies to deliver quality public services, allocate limited resources effectively, and boost agency performance. The TAM-OGD model scores an agency's strengths and areas for improvement to conceptualize citizen empowerment as a direct function of institutional capability. By transitioning passive transparency into an active operational mode, the framework enables citizens to participate more directly in governance by converting conventional OGD into actionable assets within the interactive platform. Ultimately, the achievement of these advanced maturity stages actively fosters political engagement to sustain a meaningful e-democracy. This gradual improvement facilitates organizations' readiness to confront digital transformation, particularly the paradigm shifts of redundant administrative tasks by artificial intelligence (AI), which enhances citizen trust and government transparency (Zhao et al., 2025). Furthermore, a mature transparent OGD is essential for AI implementation.

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Figure 1: Trends of CPI and EGDI between 2016 and 2024.



Note: OGDI clusters are symbolized as M: middle level and H: high level.

2. Literature Review

This section provides a foundation for transparency in OGD, including the theoretical pillars and literature, to conceptualize the structure of transparency assessment. Key stakeholders' requirements are extracted to ensure alignment with digital transparency principles and existing maturity models. Consequently, the initial set of transparency domains and their corresponding subdomains are indicated.

2.1. Theoretical foundation of Transparency Circulation in the Open Government Data

Government openness was a critical pillar for transferring government transparency to the public (Bauhr & Grimes, 2012). The mechanism generated transparency, including the transparency of the input, output, and process (Brunswicker et al., 2019; Meijer, 2009). In the context of OGD, the transparency flow in its lifecycle stemmed from the identification of transparent datasets and oversight of data manipulation, ensuring effective processing and interpretation (Janssen & van den Hoven, 2015) for citizens who obtained OGD from publishers through a portal. Proactive openness generated government transparency (Bertot et al., 2010) by eliminating information asymmetry (Chen & Chang, 2020; Hang & Junfa, 2009). This contributed to a situation in which citizens could not obtain complete and accurate information on internal government activities (Jain, 2001). Thus, a two-tier hierarchical problem between publishers and users (Lněnička & Nikiforova, 2021; Wang et al., 2022)

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

was demonstrated by principal-agent theory seeking the major contributors for problem resolution (Kofman & Lawarree, 1993). Agent-controlled transparency on the supply side shaped users' trust, publishers' accountability, and compliance with publishers' regulations (Hosseini et al., 2017) through publishing procedures (e.g., creation, collection, and disclosure) (Matheus et al., 2021). To continue the transparency loop, the released datasets were unable to drive transparency without dataset availability, distribution of results, and practical utilization. Demand-side transparency depended on the individual personality, which was perceived by information usability, unbiased decision support, and freedom of communication channels (Portes et al., 2020) to guarantee the quality, accessibility, and understandability of dataset disclosure. Moreover, this transparency mechanism was aligned with the principle of digital transparency that Matheus et al. (2021) outlined as a transparent way to integrate technology into government organizations from dataset generation to the distribution of their insights.

Moreover, the effective delivery of this public service is ensured by the collaboration of two key contributors through the co-production principle of a shift from a central publisher to a product partnership. It provided a service design strategy to improve traditional top-down public services obstructed by institutional factors (Parks et al., 1981). Participating individuals and collaborative effort became two interconnected elements of this principle (Sorrentino et al., 2018), which dissolved boundaries on both sides through the development and delivery of the product (Boyle et al., 2010). Co-delivery achievement relied on governments that facilitate technology feasibility, providing tools for citizens to drive change themselves, and the technological capacity of users, empowering them to contribute to the final output (Boyle et al., 2010; Sorrentino et al., 2018). In the context of OGD, the collaborative effort in OGD enabled transparency flow in the supply and demand sides from the blurred wall between publishers and users. Perceived transparency stemmed from data quality and reliable procedures through the oversight of data disclosure and OGD facilitation among various users that encourage citizen participation (Klein et al., 2018).

These theoretical foundations provided a fundamental way to explain the transparency movement in the OGD ecosystem from the perspective of key stakeholders who participated in publishing and usage.

2.2. Stakeholders' Requirements of Transparency for Open Government Data

In the context of establishing an initial maturity model, stakeholders' requirements were outlined, with the identification of relevant scholarly literature (Adrodegari & Saccani, 2020; Hausladen & Schosser, 2020). The semantic attributes were iteratively grouped into cohesive thematic clusters through the principles of digital transparency (Matheus et al., 2021), which were applied to outline the transparency flow for improving digital transparency. Consequently, this analytical progression ultimately yielded a finalized set of 12 stakeholders' requirements in the OGD ecosystem, which were shaped on a structured foundation for operationalizing transparency within the domain.

R1: Proactive availability

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

OGD dissemination eliminated the authorizer's permission, and government policies outlined the directives and guidelines for deploying the disclosure. These objectives advocated for transparency and established a foundation for inherent transparency in the OGD cycle (Janssen et al., 2017).

R2: Machine-readable format

According to the Digitalization of Public Administration and Services Delivery Act (B.E. 2562), a machine-readable format was used in the standardized OGD format to facilitate appropriate processing, summarization, comparison, and prediction (Silva & Pinheiro, 2018). Common file formats include XLS, XLSX, CSV, ODS, XML, and JSON. This characteristic enabled transparency with ease and convenience.

R3: Diverse purposes

Furthermore, OGD symbolized a fundamental right for everyone (Çaldağ & Gökalp, 2022) to freely access government data for diverse purposes (Saxena & Muhammad, 2018). This freedom facilitated the inspection of government activities and increased transparency (Williams, 2015).

R4: Different levels of accessibility

According to the government's data governance guidelines (B.E. 2563), only public data was permitted to be released to the public. The release of private, secure, and secret data that posed risks to national security, safety, and peace was prohibited from being released (Constitution of the Kingdom of Thailand, B.E. 2560, 2017; Official Information Act, B.E. 2540, 1997).

R5: Removal of personal identities

Along with government data governance (B.E. 2563), the Personal Data Protection Act (B.E. 2562) protected personal data from being disclosed to the public. Thus, OGD was filtered out from personal data, and personal identities were removed before publication.

R6: Clear procedures

Additionally, OGD life cycle management significantly reduced the deployment gap between publishers and users. Through the design of the OGD, both explicit procedures and the authorities' identification were prepared for transparency (Janssen & van den Hoven, 2015).

R7: Authority's capacity

The authorities' capacity was indispensable for overseeing successful tasks and ensuring continuous improvement (Matheus et al., 2021), which aligned with key policies and encouraged transparency in each procedure (Porumbescu et al., 2022).

R8: Portal and dataset compatibility

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

As an intermediary between publishers and users, the compatibility of the portal and dataset facilitated the dissemination of the quantitative and qualitative dimensions of OGD, thereby enhancing data transparency (Williams, 2015). The simplicity of the portal design promoted data utilization and accessibility, resulting in a transparent information environment (Saxena, 2017).

R9: Providing data exploration

The data exploration function facilitated users' comfortable exploration of OGD datasets, which allowed them to search, filter, learn, visualize, download, analyze, and view version history (Lněnička et al., 2021; Matheus et al., 2021; Nikiforova & McBride, 2021; Saxena, 2017). Portal data exploration features enhanced transparency in insight into the datasets.

R10: Communication features

The portal provided a feedback channel, and user feedback was provided through discussions, ratings, comments, sharing, and dataset requests. This facilitated the enhancement of stakeholders' engagement in OGD (Lněnička et al., 2021; Nikiforova & McBride, 2021) and positively affected transparency mechanisms in terms of information perception and understandability (Hosseini et al., 2017).

R11: Reliable data

According to the Digital Government Standard: Open Government Data Guideline (B.E. 2563), ten OGD characteristics were identified: completeness, primary, timeliness, accessibility, machine-readable format, non-discriminatory, non-proprietary, free license, permanence, and being free of charge. The released data underwent quality assurance through a Data Quality Assessment for Government Agencies (B.E. 2565). Reliable data advocated transparency, as their quality eliminated the information asymmetries that were transferred to the OGD ecosystem (Porumbescu et al., 2022).

R12: Metadata

Metadata displayed the properties of the data to facilitate comprehension of the dataset (Lněnička et al., 2022). This complement was published alongside its dataset to support the user's interpretation (Janssen et al., 2017; Zuiderwijk, Gascó, et al., 2014), which contributed to the transparency mechanisms (Hosseini et al., 2017).

Although the identification of stakeholder requirements served as a foundational resource during the initial phase of the maturity model, the strengthened structural groundwork required benchmarking from existing maturity models to effectively build upon the structure of the new model.

2.3. Existing Maturity Models for Open Government Data and Transparency

In addition to the principles of digital transparency, these stakeholders' requirements were demonstrated in existing maturity models in OGD and transparency, which critically encouraged the new model (Becker et al., 2009). By selecting existing maturity models, the first-round selection was intensively selected from specific scopes, including (1) search phrases that covered "open government data," "transparency," and "maturity model," (2) databases (e.g., Web of Science and Scopus), and

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

(3) publication years at least since 2000. Following the second filter, 26 existing maturity models that illustrated the OGD or transparency maturity model as research outcomes were screened in the research pool. The final group was assessed for quality using the Literature-Weighted Scoring (LWS) method (Pongpisutsopa et al., 2020) (Figure 2). These average scores (S1 to S5) were used to analyze stakeholders' requirements of the existing maturity models, which were dominant (Table 1), and how they corresponded to the extracted domains.

Figure 2: The key evaluated existing maturity models in the research pool.

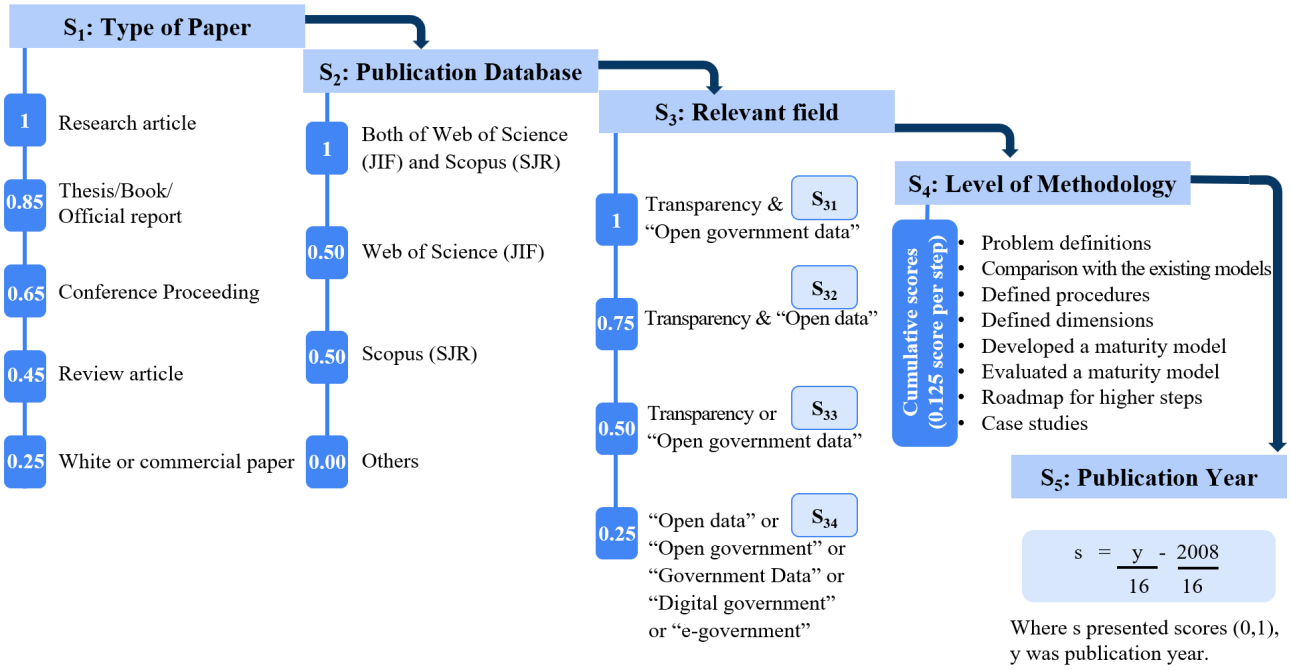


Table 1: Analysis of stakeholders' requirements in each existing maturity model.

ID	Author	Evaluated scores						Stakeholders' requirements											
		S1	S2	S3	S4	S5	Total	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
MM1	Iribarren et al. (2008)	0.65	0.50	0.25	0.38	0.00	1.78	✓	✓		✓		✓					✓	
MM2	Kalampokis et al. (2011)	0.65	0.50	0.50	0.63	0.19	2.47		✓			✓						✓	✓
MM3	Reggi (2011)	1.00	0.00	0.25	0.75	0.19	2.19		✓	✓	✓							✓	
MM4	Valdés et al. (2011)	1.00	1.00	0.25	1.00	0.19	3.44	✓	✓				✓					✓	
MM5	Lee and Kwak (2012)	1.00	1.00	0.50	1.00	0.25	3.75					✓					✓	✓	
MM6	Solar et al. (2012)	0.65	0.50	0.50	0.88	0.25	2.78	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

ID	Author	Evaluated scores						Stakeholders' requirements											
		S1	S2	S3	S4	S5	Total	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
MM7	Veljković et al. (2014)	1.00	1.00	1.00	0.75	0.38	4.13	✓	✓							✓		✓	
MM8	Dodds and Newman (2015)	0.25	0.00	0.50	0.13	0.44	1.32	✓		✓		✓		✓		✓		✓	✓
MM9	Silva and Pinheiro (2018)	1.00	0.50	0.50	0.63	0.63	3.26	✓	✓	✓		✓		✓		✓		✓	✓
MM10	Office of the Civil Service Commission (2019)	0.85	0.00	0.25	0.13	0.69	1.92			✓	✓		✓						
MM11	Rahmatika et al. (2019)	0.65	0.50	0.50	0.75	0.69	3.09	✓		✓			✓	✓	✓			✓	✓
MM12	Thomas et al. (2019)	1.00	1.00	0.50	0.50	0.69	3.69	✓						✓				✓	
MM13	Digital Government Development Agency (2020)	0.85	0.00	0.25	0.13	0.75	1.98	✓											
MM14	Zheng et al. (2020)	0.65	0.50	0.50	0.75	0.75	3.15	✓										✓	✓
MM15	Çaldağ and Gökalp (2022)	0.45	1.00	0.50	0.25	0.88	3.08						✓	✓	✓				
MM16	European Commission (2024)	0.85	0.00	0.25	0.13	0.94	2.17	✓	✓		✓		✓			✓	✓	✓	✓
MM17	Lněnička et al. (2022)	1.00	1.00	1.00	0.75	0.88	4.63		✓	✓						✓	✓	✓	✓
MM18	Park et al. (2022)	0.45	1.00	0.50	0.75	0.88	3.58			✓								✓	
MM19	Pirannejad and Ingrams (2023)	0.45	0.50	0.25	0.50	0.94	2.64	✓			✓		✓	✓	✓	✓	✓		
MM20	Amalia et al. (2024)	1.00	0.00	0.25	0.75	1.00	3.00	✓			✓		✓	✓	✓	✓	✓		
MM21	Macedo and Lemos (2024)	1.00	0.00	0.50	0.75	1.00	3.25	✓		✓			✓	✓	✓	✓	✓	✓	✓
MM22	Lourenço and Serra (2014)	0.65	0.50	0.50	0.63	0.38	2.66	✓	✓	✓					✓	✓	✓	✓	✓
MM23	Benjamin et al. (2017)	0.65	1.00	0.50	0.88	0.56	3.59	✓	✓	✓	✓		✓		✓	✓	✓	✓	

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

ID	Author	Evaluated scores						Stakeholders' requirements											
		S1	S2	S3	S4	S5	Total	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
MM24	Torii and Okada (2017)	0.65	0.50	0.50	0.38	0.56	2.59	✓	✓	✓	✓		✓					✓	
MM25	Hochstetter et al. (2021)	1.00	1.00	0.50	0.75	0.81	4.06	✓		✓	✓		✓	✓	✓	✓	✓	✓	
MM26	Hochstetter et al. (2022)	1.00	1.00	0.50	0.88	0.88	4.26	✓		✓	✓		✓	✓	✓	✓	✓	✓	
Remark: Shade of scores		0	Min		Average scores			3.0	3.0	3.1	2.8	2.7	3.0	3.1	3.2	3.2	3.3	3.1	2.9
					Frequency			19	11	14	10	5	14	11	10	13	11	21	10
		1	Max		Rank			7	7	6	11	12	9	5	2	3	1	4	10

In this evaluation, MM17, MM26, and MM7 were ranked at the top of existing OGD maturity models. There were two essential parts of domains in existing transparency maturity models. First, data transparency facilitated the availability of information, including data quality and portals. Organizational transparency focused on increasing management capabilities through organizational accountability (Williams, 2015), which included aspects such as policies, processes, communication, and accountability.

Hence, the aspects of transparency assessment for OGD covered both users' perspectives and the supply side. Furthermore, OGD maturity models concentrated on utilizing datasets to advocate data transparency for users. The transparency maturity models focused on organizational mechanisms, notably accountability, processes, and communication that supplied the flow of transparency. The theoretical contributions from existing domains in previous maturity models paved the way for developing a new assessment in the next stage.

2.4. Transparency Domains' Conceptualization for Open Government Data

The interoperation between the aforementioned transparency requirements from the literature review and the identification of existing maturity set the scene for transparency domains' conceptualization (Hausladen & Schosser, 2020) and led to the shaping of four domains in TAM-OGD.

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

2.4.1. Policy

Policy became an indispensable input for the implementation of OGD by advocating transparency and circulation through an agent-controlled mechanism. Additionally, it encouraged data publishers to proactively disseminate datasets to the public (Zuiderwijk, Helbig, et al., 2014). Explicit directives were influenced by policy alignment aimed at encompassing the overall OGD cycle (Solar et al., 2012). For instance, the Official Information Act (B.E. 2540) encouraged the dissemination of fundamental government data [R1 and R3]. The Digitalization of Public Administration and Services Delivery Act (B.E. 2562) promoted the accessibility of government data by enabling the inspection of government activities through the publication of public information in digital format [R1, R2, R8, and R11]. Guidelines for data quality control (B.E. 2565) paved the way for OGD implementation [R2 and R11]. In particular, OGD oversight of management processes and service delivery by government data governance (B.E. 2563) [R4, R5, R6, and R12] enabled publishers' trust and offered a transparent flow from data generation to utilization (Nikiforova & McBride, 2021). Furthermore, resource allocation underpinned adequate resources [R7], which were critical to the integrity of transparency in OGD procedures and overseeing the quality of the task (Matheus et al., 2021).

2.4.2. Dataset

The dataset was instrumental in the output of OGD, serving demand-side transparency. The openness property of the dataset disseminated transparency through its quality (Matheus et al., 2021) [R11], while also addressing privacy concerns [R5], standardized formats [R2], and proactive disclosure (Hosseini et al., 2017) [R1 and R3]. In addition to the quality dimension, transparency perception emphasized the objectivity of the dataset disclosure and its details (Portes et al., 2020). Under the umbrella of government transparency, three types of datasets were used to ensure transparency perception: operational capacity, organization's aims, and design of the stakeholder environment (Douglas & Meijer, 2016). This disclosure presented a neutral description and metadata that identified the fundamental details of the datasets [R12] to support comprehension. The clarity of OGD quality, quantity of transparent datasets, and appropriate details provided essential characteristics that guaranteed demand-side perception in terms of accessibility and understandability (Hosseini et al., 2017). Consequently, the insights from the dataset transferred transparent values to practical applications.

2.4.3. Portal

The portal was an intermediate platform between data publishers and users. Its features increased the transparency level through ease of use (Saxena, 2017) and stakeholder participation in feedback and dataset requests (Nikiforova & McBride, 2021) [R10]. The integration of the dataset and portal [R8] facilitated data exploration [R9] to uncover the dataset's insights, including searching, sorting, filtering, and visualization. These properties encouraged information perception and understandability for users (Lněnička et al., 2021). Therefore, the portal served as a facilitating tool for the collaboration of information flows and transparency movements by diminishing information asymmetries between key contributors (Porumbescu et al., 2022).

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

2.4.4. Accountability

Accountability was responsible for the agency's results. The achievement of the mission's institute was measured by the key transparency indicator (Veljković et al., 2014). To hold them accountable for what was happening inside the government, OGD implementation required the oversight of critical inputs to continue the successful implementation process [R7], such as the management [R1], authorities [R6], and communication [R10] (Çaldağ & Gökalp, 2022). Notably, the management level was instrumental in implementing effective management programs that align with relevant policies to eliminate corruption (Porumbescu et al., 2022). This domain engaged in agent-controlled transparency to support the oversight of the task's performance (Hochstetter et al., 2021) through executive support, communication, and the implemented process. These enforceable obligations removed the barriers of the information-sharing policy, improved data manipulation (Saxena & Muhammad, 2018), and contributed to the enhancement of transparency flow.

In addition to the structure of the four domains, each domain contained relevant subdomains, the descriptions of which were listed in Table 2. Both became indispensable parts of the initial hierarchical model in TAM-OGD (Figure 3), which included three levels (mission, four domains, and 13 subdomains).

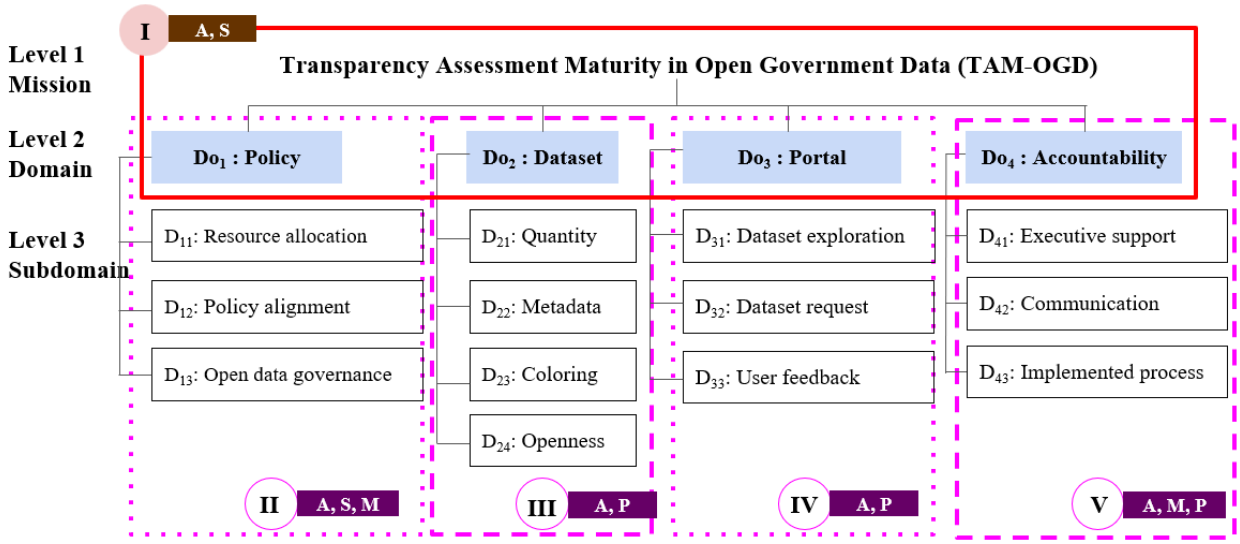
Table 2: Definition of subdomain in TAM-OGD.

Domain/Subdomain		Definition
Policy	Resource allocation	In line with the organization's mission, the agency recognized the key capability to commit its financial and human resources for its development (Chu & Chiang, 2014; Hausladen & Schosser, 2020).
	Policy alignment	The organization's strategic direction was aligned with its policy on transparency and OGD (European Commission, 2024; Gökalp et al., 2021).
	Open data governance	The data governance committee was established to supervise the execution of the OGD (European Commission, 2024).
Dataset	Quantity	Transparent datasets were accessible on the portal, that was, operational capacity, organization's aims, and stakeholder environment's design (Douglas & Meijer, 2016).
	Metadata	Information outlined the fundamental attributes of the disclosed dataset (Data Governance for Government B.E. 2563, 2020, March 31).
	Coloring	The dataset offered a completely neutral depiction. A list of the data colorings employed in terms of the success data, the failures of operational capacity, stakeholders' opinions, the optional practice, and trend expectations (Douglas & Meijer, 2016).
	Openness	The dataset was readily available for use, thereby satisfying the criteria for open data (Portes et al., 2020; Silva & Pinheiro, 2018).

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Domain/Subdomain		Definition
Portal	Dataset exploration	Portal supported users' exploring datasets (Lněnička et al., 2021; Matheus et al., 2021).
	Dataset request	Portal facilitated users' requesting datasets (Lněnička et al., 2022; Nikiforova & McBride, 2021).
	User feedback	Portal provided a communication channel for user feedback (Nikiforova & McBride, 2021).
Accountability	Executive support	The management level advocated a flow of transparency in the OGD practices (Porumbescu et al., 2022).
	Communication	Communication declared the operation of the OGD to the public (Hochstetter et al., 2022; Hochstetter et al., 2021).
	Implemented process	The clarity of procedures and relevant authorizations oversaw the OGD implementation (Janssen et al., 2017).

Figure 3: The hierarchical decision structure of initial TAM-OGD.



Note: The symbols of the expert subsets represented A: Academic, S: Senior level, M: Middle level, and P: Project level. The assignments of the group of experts were displayed in I to V.

3. Methodology

Furthermore, TAM-OGD was shaped according to the research approach presented in Figure 4. After the initial hierarchical model was constructed based on the principles of digital transparency, hierarchical decision modeling (HDM) confirmed the initial proposal's accurate representation of the intended measurements (Ayre & Scally, 2017). This approach divided complex decisions into simpler parts using a hierarchical approach (Abotah & Daim, 2017; Barham & Daim, 2020; Lavoie & Daim, 2020). It provided a method for systematically understanding the interrelationships among multiple factors that reflected the real-world priorities of public management by enabling expert panels to determine them (Shaygan & Daim, 2023). This methodology was successfully applied to

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

analyze policies that were significantly influenced by rapid technological advancements (Abotah & Daim, 2017) and brought about a structured process for turning expert opinions into a reliable assessment framework.

The experts who possessed a master's degree at the minimum education level and at least three years of data professional experience (Lněnička et al., 2021) were invited as stakeholders' representatives of the OGD ecosystem (Table A1), covering both publishers and users. Their bias and inconsistency were eliminated from the assessment process by dividing their expertise levels into subsets, including academic, senior, middle, and project (Lavoie & Daim, 2020). Based on the hierarchical decision structure (Figure 3), the assignments of each expert subset were differentiated by their varying expertise levels, which were divided into five categories (a mission (Group I) and four domains (Groups II, III, IV, and V)). The experts' judgments identified the importance level of each item (e.g., important, useful but unimportant, and unimportant), allocated 100 scores for the two items to compare the importance weights in the pairwise comparison process, and identified the boundaries of each maturity level in the desirability curve. Then, these important weights constructed the constant sum pairwise comparison judgment matrix (Equation (1)) and were transformed into the judgment quantification matrix (Equation (2)). Finally, each local weight (ω_{ds}) was computed as the row average of the normalized values within the judgment quantification matrix (Daim & Kocaoglu, 2016). Specifically, the local weight of a main domain is referred to as a domain weight (ω_d).

$$J_{E_y\text{-}E_x} = 100 - J_{E_x\text{-}E_y} \quad (1)$$

$$J_{E_x/E_y} = \frac{J_{E_x\text{-}E_y}}{J_{E_y\text{-}E_x}} = \frac{J_{E_x\text{-}E_y}}{100 - J_{E_x\text{-}E_y}} \quad (2)$$

Where

$J_{E_x\text{-}E_y}$ referred to the important weight of item x, which was compared with item y.

As the experts' opinions significantly impacted the TAM-OGD structure, the reliability of both the pairwise comparison matrices and the average quantitative scales in the desirability curve were validated. Based on the identification of importance levels, an expert consensus threshold was established to determine item inclusion in the model, requiring an acceptance rate (AR) greater than 75%, as calculated using Equation (3) (Lavoie & Daim, 2020). The saturated number of experts in each group varied according to the content validity ratio (CVR), which was computed from the total participants (N) and the number of experts who indicated the item as important (ne) using Equation (4) (Ayre & Scally, 2017; Kagias et al., 2023). Although a panel of five experts represented the lower bound for targeted expert judgment in HDM (Elhassouny & Smarandache, 2016), it satisfied the strict criteria required to ensure qualitative validity with the proportion of agreeing items equaling 1 at p-value ≤ 0.05 (Ayre & Scally, 2017). This critical point confirmed the initial proposal's accurate representation of the intended measurement (Ayre & Scally, 2017; Goncalves Filho & Waterson, 2018).

$$AR = \frac{ne}{N} \times 100 \quad (3)$$

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

$$CVR = \frac{ne - \frac{N}{2}}{\frac{N}{2}} \quad (4)$$

Based on the judgment quantification matrix and the results of the desirability curve, less than 0.1 of the consistency ratio (CR) verified the validation of systematic logic for the resulting priority by using Equation (5) (Shaygan & Daim, 2023). Moreover, before the TAM-OGD was applied to assess the transparency level, the item-level content validity index (I-CVI) was crucial in verifying objective measurements, calculated as the proportion of experts who evaluated an item as relevant by assigning a rating of 3 or 4. Consequently, the retaining items met the minimum I-CVI threshold of 0.78 (Polit et al., 2007). Subsequently, the overall quality of the model was evaluated through a structured questionnaire.

$$CR = \frac{\lambda_{ave} - n}{(n-1) \times RI} \quad (5)$$

Where

λ_{ave} denoted the mean ratio of the weighted sum value to their corresponding criteria weights within the pairwise comparison matrix.

n represented the total of evaluated dimensions.

RI referred to the random consistency index, which depended on the total number of evaluated dimensions (n) (Table 3).

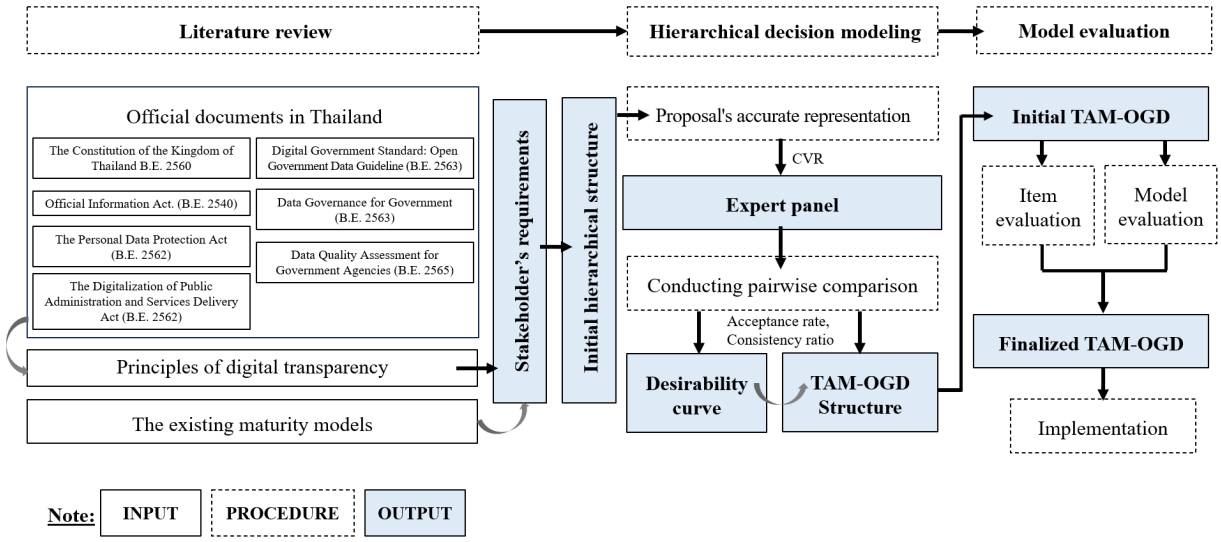
Table 3: Random consistency index (RI).

n	1	2	3	4	5	6	7	8
RI	0	0	0.5799	0.8921	1.1159	1.2358	1.3322	1.3952

Note: From "Decision making using the analytic hierarchy process (AHP); A step by step approach" by Hamed Taherdoost, 2017.

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Figure 4: Research approach.



4. Results

This section presents the outcome of the maturity model development, followed by the verification of the new model, and highlights its practical implementation across the target public sectors in Thailand.

4.1. TAM-OGD Structure

At the saturation point of the HDM, 18 Thai experts met the research qualifications and participated in this study (Table 4), including stakeholders' representatives from publishers (six government agencies and three researchers) and users (six civil society technology organizations and three information technology executives). As presented in Table 5, all evaluated items achieved a minimum acceptance rate, with more than 75% of the experts recognizing the importance of the evaluated item (Lavoie & Daim, 2020). No more than a 0.1 consistency ratio for each assignment appeared in the pairwise comparison matrix. Consequently, the global weights (Gω) of the essential elements represented how the factors emphasized transparency assessment and were used to calculate the overall maturity score (Table 6).

Therefore, TAM-OGD contained a self-assessment of the transparency level for OGD. The evaluations used a desirability curve that charted the capability maturity of each identified subdomain in five stages, as presented in Figure 5. The scoring thresholds were calibrated according to expert opinions to index a standardized score from 0 to 100 (Table A2). Subsequently, these scores were derived by multiplying evaluated scores from the implementation to yield subdomain maturity scores. The overall maturity score (M) was then calculated by applying Equation (6) as summarizing the products of each subdomain maturity score (m_{ij}) and its corresponding global weight ($G\omega_{ij}$) (Shaygan & Daim, 2023). Based on the maturity results, these determined the starting point of the

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

agency's status and carried forward the challenge goal for improvement to higher maturity, along with the TAM-OGD.

$$M = 0.118\, m_{11} + 0.112\, m_{12} + 0.092 m_{13} + 0.059\, m_{21} + 0.065\, m_{22} + 0.064\, m_{23} \quad (6)$$
$$+ 0.065\, m_{24} + 0.072\, m_{31} + 0.043\, m_{32} + 0.051\, m_{33} + 0.084\, m_{41} + 0.079\, m_{42} + 0.096\, m_{43}$$

Table 4: Expert groups and their assignments.

Group	Assignment	Academic level	Senior level	Middle level	Project level	Total
I	Mission	5	3	-	-	8
II	Policy	4	3	1	-	8
III	Dataset	8	-	-	5	13
IV	Portal	3	-	-	2	5
V	Accountability	3	-	1	1	5

Table 5: The results of the item's acceptance rate.

Group	Element	Symbol	CVR	Acceptance rate	Decision	Consistency ratio
I	Policy	Do1	0.75	87.50	Retain	0.0029
	Dataset	Do2	0.75	87.50	Retain	
	Portal	Do3	0.75	87.50	Retain	
	Accountability	Do4	1.00	100.00	Retain	
II	Resource allocation	D11	1.00	100.00	Retain	0.0088
	Policy alignment	D12	0.75	87.50	Retain	
	Open data governance	D13	0.75	87.50	Retain	
III	Quantity	D21	0.54	76.92	Retain	0.0029

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

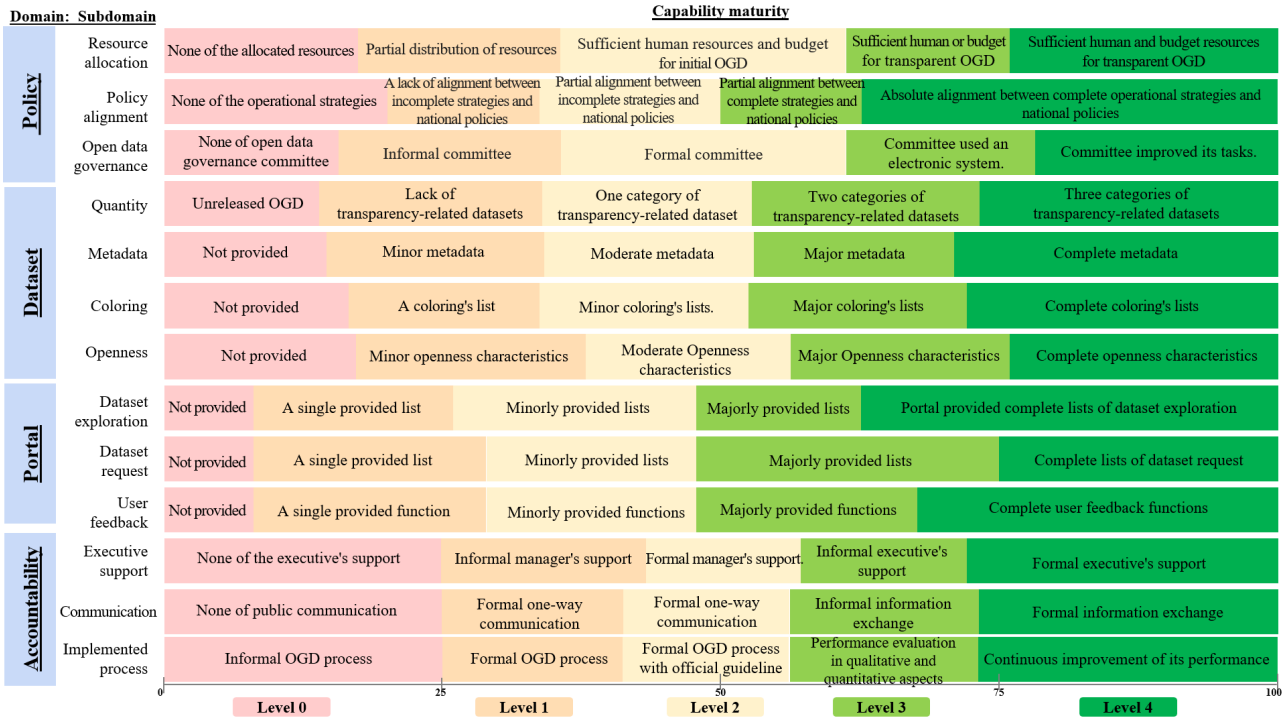
Group	Element	Symbol	CVR	Acceptance rate	Decision	Consistency ratio
	Metadata	D22	0.85	92.31	Retain	
	Coloring	D23	0.54	76.92	Retain	
	Openness	D24	1.00	100.00	Retain	
IV	Dataset exploration	D31	1.00	100.00	Retain	0.0005
	Dataset request	D32	1.00	100.00	Retain	
	User feedback	D33	1.00	100.00	Retain	
V	Executive support	D41	1.00	100.00	Retain	0.0013
	Communication	D42	1.00	100.00	Retain	
	Implemented process	D43	1.00	100.00	Retain	

Table 6: The results of the evaluated item's importance.

Domain	Domain weight (ω_d)	Subdomain	Local weight (ω_{ds})	Global weight ($\omega_d \times \omega_{ds}$)
Policy	0.3219	Resource allocation	0.3666	0.1180
		Policy alignment	0.3484	0.1121
		Open data governance	0.2850	0.0917
Dataset	0.2532	Quantity	0.2348	0.0595
		Metadata	0.2576	0.0652
		Coloring	0.2524	0.0639
		Openness	0.2552	0.0646
Portal	0.1660	Dataset exploration	0.4328	0.0718
		Dataset request	0.2588	0.0430
		User feedback	0.3084	0.0512
Accountability	0.2590	Executive support	0.3236	0.0838
		Communication	0.3066	0.0794
		Implemented process	0.3698	0.0958

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Figure 5: TAM-OGD and its desirability curve.



4.2. Model Evaluation

Before TAM-OGD was applied to assess the transparency level of OGD, quality investigation was crucial in ensuring performance by verifying objective measurements using the CVI and evaluating the overall model using a structured questionnaire. To test content validity, three experts assessed the relevance of each question to its objective. The average scale-level content validity index (S-CVI/Ave) of 135 evaluated items in the first version was 0.96. Because 13 items had an I-CVI lower than 0.78, these were removed from the model. Then, S-CVI/Ave of 122 retained items was changed to one. This meant that each item in the model was aligned with the assessment's objective (Polit et al., 2007). Moreover, five experts evaluated the overall model quality, which received average scores above 4 out of 5, and the assessment was notable in terms of uniqueness, usefulness, and consistency. Thereafter, TAM-OGD was achieved through instrument quality validation, making it a practical self-assessment tool for the transparency level of OGD.

4.3. Implementation

Furthermore, TAM-OGD was implemented by three public sectors in Thailand, namely Cases I, II, and III, which were agencies at the departmental level or equivalent and have released OGD on the national portal, comprising transparency datasets. Each organizational representative had been responsible for OGD for more than five years. The implementation evaluated the 122 items in TAM-OGD through self-assessment of the organizational representative, based on evidence including relevant policies or strategies, artifacts of OGD dissemination, portal checklists, and OGD operational

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

documentation. The final scores were determined using Equation (6). Consequently, all case studies were located at Level 3, with overall scores of 3.36, 3.04, and 3.47, respectively. However, each dimension yielded different results (Figure 6). Although Case Study I achieved a perfect score in terms of policy and accountability, openness defects confronted the disclosure of unstructured files without timeliness and primary decreased the dataset domain score to 2.97. The inconvenient features of dataset utilization obstruct the flow of transparency into public perception, including the revision history of the dataset, dataset request form, and display of user comments. These disadvantages reduced the score on the portal domain to the lowest, similar to the evaluation results for Cases II and III.

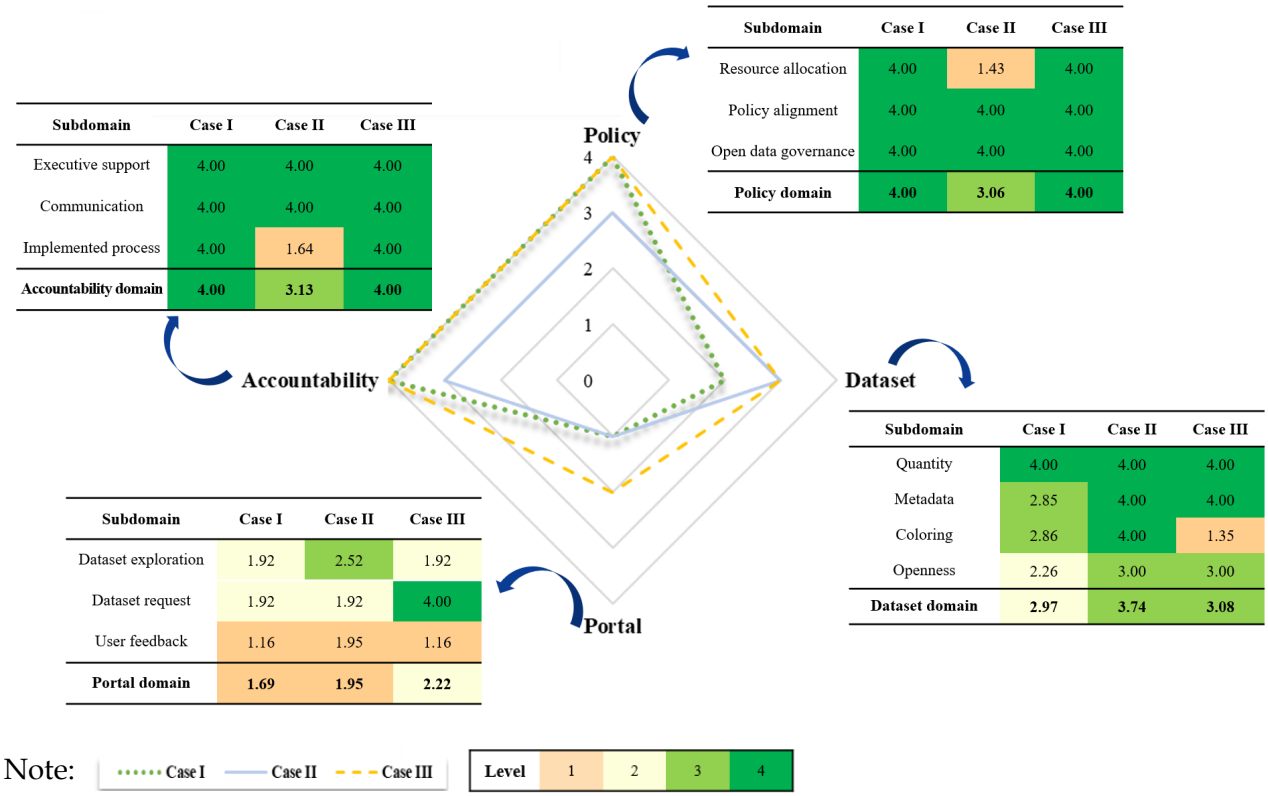
Notably, the dominant characteristic of Case II in the dataset domain received a score of 3.74. Minor disadvantages in terms of quality dimensions were related to late periodic data updates and restricted licenses for certain datasets. Its policy performance reached the lower bound of Level 3 because essential resources were insufficient to operate a transparent OGD. Although the request for additional manpower was submitted to the central government, practical procedures required a long time for approval. This resulted in the unsuccessful implementation of the OGD process, stemming from the failure to assign an operational OGD committee and identify qualitative indicators of OGD.

Case Study III was outstanding in terms of policy and accountability. However, the failure of a seamless connection between the portal and the dataset neglected the elimination of information asymmetry. In particular, Case III achieved Level 1 in the coloring aspect because the defectiveness of the disclosure of dataset descriptions underpinned transparency perceptions such as operational capacity, stakeholder opinion, optional practice, and trend expectations. Similarly, the problem of dataset quality surpassed machine-readable formats and primary diminished the openness aspect score.

There were different capabilities among Thailand’s public sector samples. The strength point was demonstrated in the policy and accountability aspects through the lens of TAM-OGD. Conversely, the dataset's compatibility with portal aspects highlighted the weakness. Thus, data quality improvement, data value enhancement, and the development of portal features increased organizational capabilities and the level of transparency for OGD.

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Figure 6: Implementation results.



Subdomain	Case I	Case II	Case III
Executive support	4.00	4.00	4.00
Communication	4.00	4.00	4.00
Implemented process	4.00	1.64	4.00
Accountability domain	**4.00**	**3.13**	**4.00**

Subdomain	Case I	Case II	Case III
Resource allocation	4.00	1.43	4.00
Policy alignment	4.00	4.00	4.00
Open data governance	4.00	4.00	4.00
Policy domain	**4.00**	**3.06**	**4.00**

Subdomain	Case I	Case II	Case III
Quantity	4.00	4.00	4.00
Metadata	2.85	4.00	4.00
Coloring	2.86	4.00	1.35
Openness	2.26	3.00	3.00
Dataset domain	**2.97**	**3.74**	**3.08**

Subdomain	Case I	Case II	Case III
Dataset exploration	1.92	2.52	1.92
Dataset request	1.92	1.92	4.00
User feedback	1.16	1.95	1.16
Portal domain	**1.69**	**1.95**	**2.22**

5. Discussion

This section provides a critical interpretation of the research results throughout the process of TAM-OGD construction and key insights from its implementation in Thailand. Additionally, the implications of these findings lead to improvements in public management practices.

TAM-OGD is developed as an effective transparency evaluation tool. Its layout aligns with the top-rank maturity models, MM17, MM26, and MM7. The similarity between TAM-OGD and MM26 is policy and agency accountability, but relevant processes in MM26 place emphasis on e-government electronic processes, which differ from OGD implementation in the new model. Moreover, MM7 used two key indicators of transparency: data and government transparency. However, their assessments uncover key elements of OGD drivers, including portals, policies, and accountability. Similarly, MM17 develops a transparency maturity model for OGD from a user's perspective. It lacks policies and accountability from the perspective of data providers. Owing to the intensive systematic literature review, four domains in this maturity model are covered, encompassing both publisher and user perspectives, to evaluate the transparency level of OGD through the principal-agent theory. The demand side plays the principal role and is unable to understand or perceive the governmental affairs of the agent aspect. Evaluation of the OGD dataset is indispensable for eliminating distinct

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

information asymmetries. Citizens demand dataset dissemination, which represents organization-wide cooperation (Rasool et al., 2022) to ensure the quality of data, systems, and services, ultimately facilitating the narrative of insight extraction from datasets by providing context, clarity, and a neutral presentation. In addition to releasing the dataset of standardized quality, the data provider offers coloring and quantities that serve as detailed descriptions, demonstrating the characteristics of clarity, objectivity, and openness. Adequately targeted details fulfill the transparency perception regarding the well-defined specifics and objectives of representing facts displayed on a portal (Douglas & Meijer, 2016). Additionally, data storytelling transforms raw operational data into public assets to improve user understanding. In these translation phases, intermediaries undertake the role of communicators and distribute complex government datasets into valuable. Because they facilitate user-friendly information, citizens can easily understand and use it (González-Zapata & Heeks, 2015). Consequently, value-oriented OGD brings usage advantages to users, and its impact fosters interdepartmental data exchange.

Additionally, portals act as intermediaries between the two contributors and advocate for comfortable dataset usage. Both the dataset and portal essentially have a part in the structure of TAM-OGD, which is paved with the fundamental layout from the top three average scores of OGD stakeholders' requirements [R10, R8, and R9]. However, these essential touchpoints do not meet user requirements in terms of comfortable usage and usefulness. Integrating the detailed dataset with the interactive portal resolves the barrier to information availability between the principal and agent. This seamless connection eliminates data silos, reduces data duplication (Saxena & Muhammad, 2018), creates efficient administrative processes (Attard et al., 2015), and reduces operational costs. To blur explicit distinctions, the supply side should shift from central providers to facilitators by providing a proactive portal that offers a positive user experience and data quality fulfilled with insight-detailed descriptions to boost OGD adoption.

Furthermore, expert opinions emphasize the importance of resource allocation, policy alignment, and the implemented process, which are involved in the policy and accountability domains, respectively. As these dominants represent the supply side that paves the way for transparent circulation of OGD implementation, publishers consider users' transparent perception from the objective of dataset generation to complete dissemination. As mentioned, transparency in OGD operations requires more than simply policy pressure to comply with the aforementioned regulations or allocate adequate essential resources (e.g., human resources and finance) (Kim & Eom, 2019; Safarov, 2018), overseeing the implementation to align with transparency principles (Porumbescu et al., 2022). The successful tasks depend on the agency's accountability through standardized procedures and assigned responsibilities, covering the entire process from dataset preparation to information use (Janssen et al., 2017). These dissimilarities conflict with the principle of co-production, which provides a participatory way to deliver public services on both sides (Parks et al., 1981). There is a discrepancy in how the public sector conducts its accountability by adhering to government policy, which is derived from top-down policy compliance through a publisher-side lens. To eliminate this distinction, the OGD governance committee should incorporate user-side metrics, including published datasets, downloads, API calls, and feedback, into its KPI governance system. This internal

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

improvement simultaneously promotes public communication through formal information exchange, which can integrate policy responsibility into accountable facilitators and reduce information asymmetry.

According to the practical cases, Thailand's implementation confronts the issue of unsuccessful OGD quality, despite multiple guidelines and standard announcements on OGD that have been published since 2023. Thus, an explicit guarantee from the central agency forces the public sector to increase the quality of released data through enhanced data management and simultaneously emphasizes the transparent dissemination of the dataset's contexts. Moreover, the organizational leader oversees the alignment with data standards facilitated by the OGD governance committee at the agency level. Their responsibilities include guaranteeing data quality, recommending practices for closing weaknesses, and assigning an outdated dataset to the data owner to update the dissemination. Notably, the significantly low score on portal maturity from the case studies lacks key stakeholders' interactions through incomplete essential features, including a transparent flow of dataset exploration, dataset requests, and user feedback. The evaluation results provide evidence that the portal represents a data warehouse to support the storage and dissemination of OGD, but it disregards user friendliness. This explicit disadvantage demonstrates the high administrative burden on users and the elimination of government transparency. By complying with the co-production principle, a user-centered design transforms the conventional portal into an OGD workspace. The operational policy should focus on developing the portal features' usability to enhance their friendliness and attract participation, promote data value creation (Nikiforova & McBride, 2021), and facilitate transparency flow (Lněnička et al., 2021). Therefore, an interactive platform facilitates comfortable features for exploring, filtering, visualizing, and communicating through feedback and dataset request mechanisms. Underlying the improvement in this transition phase, civic technologists take charge of software developers and designers of user experience, provide digital infrastructure, and mitigate technical barriers to dataset utility (González-Zapata & Heeks, 2015). This improvement ensures satisfied users and motivates OGD adoption through internal operations, including governing the responsible staff and engaging in a feedback loop.

Noticeably, TAM-OGD acts as a diagnostic tool to catalyze the transformation of the public sector from the supply side into a facilitator. Public managers emphasize the determination of these critical touchpoints to blur the distinction between opinions aligned with the co-production principle, as presented in Table 7. These inconsistent perspectives of publishers and users in prioritizing potential demands from Thailand's implementation are potentially applicable to other countries worldwide, demonstrating similar issues. Furthermore, this maturity model can evaluate other public sectors in Thailand and other countries to identify unachieved perspectives and specify a progressive way forward at various levels. Significant strategic improvements have translated into public policies in the long term, establishing a user-centric data standard and portal design, investing in effective resources for digital governance, and increasing agency performance. This movement encourages organizations to confront digital transformation and shift to smart governments.

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Table 7: Key findings from TAM-OGD and recommendations for public sector management.

Inconsistent issues	Governance capability	Value-oriented OGD	Interactive platform
Publisher side	Top-down compliance is overseen by policies and accountability.	OGD focuses on adhering to national policy by disseminating data to the public.	The portal represents the data warehouse.
User side	Most users are unaware of the internal governance.	OGD fulfills the context, clarity, and neutral presentation.	The portal facilitates the OGD workspace.
Implications for public sector management	The ineffective public communication leads to the unfamiliar issue and information asymmetry.	OGD lacks the narrative and context of the insight extraction.	The portal emphasizes policy compliance.
Recommendations for facilitator	The organization integrates user-side metrics into KPI governance.	Data storytelling transforms raw operational data into public assets.	The portal provides comfortable features from user-centered design.

6. Conclusion

This study constructs a TAM-OGD model using hierarchical decision modeling. The interaction between the literature review and experts' evaluations shapes the structure of transparency assessment for OGD, including policy, dataset, portal, and accountability. These indispensable elements demonstrate organizational performance in enabling transparency circulation, aligning with the principle of digital transparency, and eliminating information asymmetry through the lens of the principal-agent theory. In addition to the evaluation tool, TAM-OGD can improve its operational drawbacks and provide strategic foresight for agencies, facilitating its scale-up to the national level. Moreover, the diagnostic results highlight the gap between theoretical transparency and its implementation in public organizations. The impactful evidence-based framework elucidates strategically prioritizing critical improvements or potential benefits that pave the way for the appropriate allocation of limited resources to digital transparency initiatives and maximize the user-centric public effect. These implications raise public sector managers' awareness that TAM-OGD has become a critical mechanism for government transparency, bringing about sustained citizen trust, transforming accountability, and ensuring effective organizational capacity.

Although the findings offer deep insights into the Thai context, relying on a localized expert panel may limit the transferability of these results to different regulatory or cultural environments. However, because the underlying 12 stakeholder requirements are derived from international OGD literature, the core structural framework remains broadly applicable to other developing or emerging digital government contexts. Future studies should include an international cohort to test for global scalability. Furthermore, the HDM represents a robust methodology to verify the accuracy of the new model, replicating the construct of impact assessment models in other fields of OGD, such as

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

innovation creation, cultural transformation, and citizen engagement. Additionally, a possible opportunity may expand this maturity model to shape the OGD landscape of continuous organizational strategy to encounter digital disruptions, which leads to a shift in effective routine processes, satisfactory enhancement of public service, and collaboration across different departments or other business types. An advanced maturity model should use AI prediction algorithms that adapt the evaluated elements in the model to fluctuating situations.

References

Abotah, R., & Daim, T. U. (2017). *Towards building a multi perspective policy development framework for transition into renewable energy*. Sustainable Energy Technologies and Assessments, 21, 67-88. https://doi.org/10.1016/j.seta.2017.04.004

Adrodegari, F., & Saccani, N. (2020). *A maturity model for the servitization of product-centric companies. Journal of Manufacturing Technology Management*, 31(4), 775-797. https://doi.org/10.1108/jmtm-07-2019-0255

Amalia, E., Hamdani, D., & Nugraha, U. (2024). *E-Government Maturity Model Based on SPBE at Department of Spatial Planning and Development*. International Journal of Engineering Continuity, 3(2), 22-33. https://doi.org/10.58291/ijec.v3i2.262

Attard, J., Orlandi, F., Scerri, S., & Auer, S. (2015). *A systematic review of open government data initiatives*. Government Information Quarterly, 32(4), 399-418. https://doi.org/10.1016/j.giq.2015.07.006

Ayre, C., & Scally, A. J. (2017). *Critical Values for Lawshe's Content Validity Ratio*. Measurement and Evaluation in Counseling and Development, 47(1), 79-86. https://doi.org/10.1177/0748175613513808

Barham, H., & Daim, T. (2020). *The use of readiness assessment for big data projects*. Sustainable Cities and Society, 60, 12. https://doi.org/10.1016/j.scs.2020.102233

Bauhr, M., & Grimes, M. (2012). *What is government transparency? New measures and relevance for quality of government*. The quality of government institute, 1-27.

Becker, J., Knackstedt, R., & Pöppelbuß, J. (2009). *Developing Maturity Models for IT Management.* Business & Information Systems Engineering, 1(3), 213-222. https://doi.org/10.1007/s12599-009-0044-5

Benjamin, K., Cappelli, C., & Santos, G. (2017). Organizational Transparency Maturity Assessment Method. In *Proceedings of the 18th Annual International Conference on Digital Government Research*, (pp. 477-484).

Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). *Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies*. Government Information Quarterly, 27(3), 264-271. https://doi.org/10.1016/j.giq.2010.03.001

Boyle, D., Slay, J., & Stephens, L. (2010). *Public services inside out. Putting co-production into practice*. London: NESTA.

Brunswicker, S., Pujol Priego, L., & Almirall, E. (2019). *Transparency in policy making: A complexity view*. Government Information Quarterly, 36(3), 571-591. https://doi.org/10.1016/j.giq.2019.05.005

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Çaldağ, M. T., & Gökalp, E. (2022). *The maturity of open government data maturity: a multivocal literature review*. Aslib Journal of Information Management, 74(6), 1007-1030. https://doi.org/10.1108/ajim-11-2021-0354

Chen, Y.-C., & Chang, T.-W. (2020). *Explaining Government's Online Transparency on Collaborative Policy Platforms: Risk Management and Configurational Conditions*. Public Performance & Management Review, 43(3), 560-586. https://doi.org/10.1080/15309576.2019.1574591

Chu, P.-y., & Chiang, S.-y. (2014). *A Study of Establishing Evaluation Indices for Open Government Data*. In 14th European Conference on eGovernment, (pp. 393-401).

Constitution of the Kingdom of Thailand B.E. 2560. (2017, April 6). *Government Gazette. No. 134 Section 40A. page 1-90*.

Daim, T. U., & Kocaoglu, D. (2016). *Hierarchical decision modeling*. Essays in Honor of Dundar F. Kocaoglu.

Data Governance for Government B.E. 2563. (2020, March 31). *Government Gazette. No. 137 Section 74 D. page 47-48*.

Digital Government Development Agency. (2020). *Digital Government Maturity Model*. Retrieved from https://www.dga.or.th/policy-standard/policy-regulation/dg-readiness-survey/readinesssurvey63/59801/

Digital Government Development Agency. (2021). *Government data catalog guideline (B.E. 2564).* Retrieved from https://standard.dga.or.th/standard/

Digital Government Development Agency. (2022). *Data Quality Assessment for Government Agency*. Retrieved from https://standard.dga.or.th/standard

Digital Government Standard: Open Government Data Guideline B.E. 2563. (2020, June 24). *Government Gazette. No. 137 Section 148 D. page 26-28.*

Digitalization of Public Administration and Services Delivery Act B.E. 2562. (2019, May 22). *Government Gazette. No. 136 Section 67 A. page 57-66.*

Dodds, L., & Newman, A. (2015). *Open Data Maturity Model*. London: Open Data Institute.

Dos Santos Brito, K., Silva Costa, M. A., Garcia, V. C., & Romero de Lemos Meira, S. (2014). Experiences Integrating Heterogeneous Government Open Data Sources to Deliver Services and Promote Transparency in Brazil. In *2014 IEEE 38th Annual Computer Software and Applications Conference*, (pp. 606-607).

Douglas, S., & Meijer, A. (2016). *Transparency and Public Value – Analyzing the Transparency Practices and Value Creation of Public Utilities*. International Journal of Public Administration, 39(12), 940-951. https://doi.org/10.1080/01900692.2015.1064133

Elhassouny, A., & Smarandache, F. (2016). *Multi-criteria decision making method for n-wise criteria comparisons and inconsistent problems*. Infinite Study.

Electronic Performance of Administrative Functions Act B.E. 2565. (2022, October 12). *Government Gazette. No. 139 Section 63 A. page 1-9.*

European Commission. (2024). *Open Data Maturity Report 2024*. https://doi.org/10.2830/8656811

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Gökalp, M. O., Gökalp, E., Kayabay, K., Koçyiğit, A., & Eren, P. E. (2021). *The development of the data science capability maturity model: a survey-based research*. Online Information Review, 46(3), 547-567. https://doi.org/10.1108/oir-10-2020-0469

Goncalves Filho, A. P., & Waterson, P. (2018). *Maturity models and safety culture: A critical review*. Safety Science, 105, 192-211. https://doi.org/10.1016/j.ssci.2018.02.017

González-Zapata, F., & Heeks, R. (2015). Understanding multiple roles of intermediaries in open government data. In *13th International Conference on Social Implications of Computers in Developing Countries*, (pp. 1-10).

Hang, W., & Junfa, D. (2009). An Information Transparency Evaluation Method Based on SVM. In *2009 Third International Symposium on Intelligent Information Technology Application*, 630-633. https://doi.org/10.1109/iita.2009.153

Hausladen, I., & Schosser, M. (2020). *Towards a maturity model for big data analytics in airline network planning*. Journal of Air Transport Management, 82, 101721-101739. https://doi.org/10.1016/j.jairtraman.2019.101721

Hochstetter, J., Diaz, J., Dieguez, M., Espinosa, R., Arango, J., & Cares, C. (2022). *Assessing Transparency in eGovernment Electronic Processes.* IEEE Access, 10, 3074-3087. https://doi.org/10.1109/access.2021.3137799

Hochstetter, J., Vairetti, C., Cares, C., Ojeda, M. G., & Maldonado, S. (2021). *A Transparency Maturity Model for Government Software Tenders.* IEEE Access, 9, 45668-45682. https://doi.org/10.1109/access.2021.3067217

Hosseini, M., Shahri, A., Phalp, K., & Ali, R. (2017). *Four reference models for transparency requirements in information systems*. Requirements Engineering, 23(2), 251-275. https://doi.org/10.1007/s00766-017-0265-y

Iribarren, M., Concha, G., Valdes, G., Solar, M., Villarroel, M. T., Gutiérrez, P., & Vásquez, Á. (2008). Capability maturity framework for eGovernment: A multi-dimensional model and assessing tool. In *electronic Government: 7th International Conference*, (pp. 136-147). Berlin, Heidelberg: Springer Berlin Heidelberg.

Jain, A. K. (2001). *Corruption: A Review*. Journal of Economic Surveys, 15(1), 71-121. https://doi.org/10.1111/1467-6419.00133

Jamieson, D., Wilson, R., & Martin, M. (2019). *The (im)possibilities of open data?* Public Money & Management, 39(5), 364-368. https://doi.org/10.1080/09540962.2019.1611240

Janssen, M., Matheus, R., Longo, J., & Weerakkody, V. (2017). *Transparency-by-design as a foundation for open government*. Transforming Government: People, Process and Policy, 11(1), 2-8. https://doi.org/10.1108/tg-02-2017-0015

Janssen, M., & van den Hoven, J. (2015). *Big and Open Linked Data (BOLD) in government: A challenge to transparency and privacy?* Government Information Quarterly, 32(4), 363-368. https://doi.org/10.1016/j.giq.2015.11.007

Kagias, P., Sariannidis, N., Garefalakis, A., Passas, I., & Kyriakogkonas, P. (2023). *Validating the Whistleblowing Maturity Model Using the Delphi Method.* Administrative Sciences, 13(5), 120. https://doi.org/10.3390/admsci13050120

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Kalampokis, E., Tambouris, E., & Tarabanis, K. (2011). Open government data: A stage model. In *Electronic Government: 10th IFIP WG 8.5 International Conference, EGOV 2011, Delft, The Netherlands, August 28–September 2, 2011., Proceedings 10* (pp. 235-246). Springer Berlin Heidelberg.

Kim, J. H., & Eom, S.-J. (2019). *The Managerial Dimension of Open Data Success: Focusing on the Open Data Initiatives in Korean Local Governments*. Sustainability, 11(23), 6758-6773. https://doi.org/10.3390/su11236758

Klein, R. H., Klein, D. C. B., & Luciano, E. M. (2018). *Identification of mechanisms for the increase of transparency in open data portals: an analysis in the Brazilian context*. Cadernos EBAPE.BR, 16(4), 692-715. https://doi.org/10.1590/1679-395173241

Kofman, F., & Lawarree, J. (1993). *Collusion in hierarchical agency*. Econometrica: Journal of the Econometric Society, 629-656.

Lavoie, J. R., & Daim, T. (2020). *Towards the assessment of technology transfer capabilities: An action research-enhanced HDM model*. Technology in Society, 60, 13. https://doi.org/10.1016/j.techsoc.2019.101217

Lee, G., & Kwak, Y. H. (2012). *An Open Government Maturity Model for social media-based public engagement*. Government Information Quarterly, 29(4), 492-503. https://doi.org/10.1016/j.giq.2012.06.001

Lněnička, M., Machova, R., Volejníková, J., Linhartová, V., Knezackova, R., & Hub, M. (2021). *Enhancing transparency through open government data: the case of data portals and their features and capabilities*. Online Information Review, 45(6), 1021-1038. https://doi.org/10.1108/oir-05-2020-0204

Lněnička, M., & Nikiforova, A. (2021). *Transparency-by-design: What is the role of open data portals?* Telematics and Informatics, 61, 101605. https://doi.org/10.1016/j.tele.2021.101605

Lněnička, M., Nikiforova, A., Luterek, M., Azeroual, O., Ukpabi, D., Valtenbergs, V., & Machova, R. (2022). *Transparency of open data ecosystems in smart cities: Definition and assessment of the maturity of transparency in 22 smart cities*. Sustainable Cities and Society, 82, 103906-103924. https://doi.org/10.1016/j.scs.2022.103906

Lourenço, R. P., & Serra, L. (2014). An Online Transparency for Accountability Maturity Model. In M. Janssen, H. J. Scholl, M. A. Wimmer, & F. Bannister, Electronic Government, *Electronic Government: 13th IFIP WG 8.5 International Conference, EGOV 2014, Dublin, Ireland, September 1-3, 2014, Proceedings* (vol. 8653, pp. 35-46). Springer, Berlin Heidelberg. https://doi.org/10.1007/978-3-662-44426-9_3

Macedo, D. F., & Lemos, D. L. d. S. (2024). *Open government data: maturity diagnosis model for quality data published on the web*. Em Questão, 30, 1-28. https://doi.org/10.1590/1808-5245.30.132617

Matheus, R., Janssen, M., & Janowski, T. (2021). *Design principles for creating digital transparency in government*. Government Information Quarterly, 38(1), 101550-101568. https://doi.org/10.1016/j.giq.2020.101550

Meijer, A. (2009). *Understanding modern transparency*. International Review of Administrative Sciences, 75(2), 255-269. https://doi.org/10.1177/0020852309104175

Nikiforova, A., & McBride, K. (2021). *Open government data portal usability: A user-centred usability analysis of 41 open government data portals*. Telematics and Informatics, 58, 101539-101562. https://doi.org/10.1016/j.tele.2020.101539

Office of the Civil Service Commission. (2019). *Digital Government Maturity Domain and Area*. Retrieved from https://www.ocsc.go.th/sites/default/files/attachment/page/mda_220762_v3.pdf

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Official Information Act. B.E. 2540. (1997, September 10). *Government Gazette. No. 114 Section 46 A. page 1-16.*

Park, J. J., Kim, E., & Jun, H. J. (2022). *Development of an Open Government Data (OGD) Evaluation Framework for BIM*. Buildings, 12(4), 1-26.

Parks, R. B., Baker, P. C., Kiser, L., Oakerson, R., Ostrom, E., Ostrom, V., Percy, S. L., Vandivort, M. B., Whitaker, G. P., & Wilson, R. (1981). *Consumers as Coproducers of Public Services: Some Economic and Institutional Considerations*. Policy Studies Journal, 9(7), 1001-1011. https://doi.org/10.1111/j.1541-0072.1981.tb01208.x

Personal Data Protection Act B.E. 2562. (2019, May 27). *Government Gazette. No. 136 Section 69 A. page 52-95.*

Pirannejad, A., & Ingrams, A. (2023). *Open Government Maturity Models: A Global Comparison*. Social Science Computer Review, 41(4), 1140-1165. https://doi.org/10.1177/08944393211063107

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). *Is the CVI an acceptable indicator of content validity? Appraisal and recommendations*. Res Nurs Health, 30(4), 459-467. https://doi.org/10.1002/nur.20199

Pongpisutsopa, S., Thammaboosadee, S., & Chuckpaiwong, R. (2020). *Factors Affecting HR Analytics Adoption: A Systematic Review Using Literature Weighted Scoring Approach*. Asia Pacific Journal of Information Systems, 30(4), 847-878. https://doi.org/10.14329/apjis.2020.30.4.847

Portes, A., N'Goala, G., & Cases, A.-S. (2020). *Digital transparency: Dimensions, antecedents and consequences on the quality of customer relationships*. Recherche et Applications en Marketing (English Edition), 35(4), 72-98. https://doi.org/10.1177/2051570720973548

Porumbescu, G., Meijer, A., & Grimmelikhuijsen, S. (2022). *Government Transparency: State of the Art and New Perspectives.* Cambridge University Press. https://doi.org/10.1017/9781108678568

Rahmatika, M., Krismawati, D., Rahmawati, S. D., Arief, A., Sensuse, D. I., & Dzulfikar, M. F. (2019). An open government data maturity model: A case study in BPS-statistics Indonesia. In *2019 7th International Conference on Information and Communication Technology (ICoICT)*, (pp. 1-7). IEEE.

Rasool, T., Sajid, M., & Warraich, N. (2022). *Factors Influencing the Citizens' Satisfaction Towards the Use of Open Government Data: A Systematic Literature Review*. JeDEM - eJournal of eDemocracy and Open Government, 14(2), 167-196. https://doi.org/10.29379/jedem.v14i2.705

Reggi, L. (2011). *Benchmarking open data availability across europe: The case of eu structural funds*. European Journal of ePractice, 12, 17-31.

Roetzel, P., & Fehrenbacher, D. (2019). *On the role of information overload in information systems (IS) success: Empirical evidence from decision support systems*. Fortieth International Conference on Information Systems, Munich 2019.

Safarov, I. (2018). *Institutional Dimensions of Open Government Data Implementation: Evidence from the Netherlands, Sweden, and the UK*. Public Performance & Management Review, 42(2), 305-328. https://doi.org/10.1080/15309576.2018.1438296

Saxena, S. (2017). *"Usage by stakeholders" as the objective of "transparency-by-design" in open government data.* Information and Learning Science, 118(7/8), 420-432. https://doi.org/10.1108/ils-05-2017-0034

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Saxena, S., & Muhammad, I. (2018). *The impact of open government data on accountability and transparency*. Journal of Economic and Administrative Sciences, 34(3), 204-216. https://doi.org/10.1108/jeas-05-2017-0044

Shaygan, A., & Daim, T. (2023). *Technology management maturity assessment model in healthcare research centers*. Technovation, 120, 102444-102466. https://doi.org/10.1016/j.technovation.2021.102444

Silva, P. N., & Pinheiro, M. M. K. (2018). *DGABr: Metric for evaluating Brazilian open government data*. Informação & Sociedade, 28(3), 225-243.

Solar, M., Concha, G., & Meijueiro, L. (2012). A model to assess open government data in public agencies. In *Electronic Government: 11th IFIP WG 8.5 International Conference, Norway* (pp. 210-221). Springer.

Sorrentino, M., Sicilia, M., & Howlett, M. (2018). *Understanding co-production as a new public governance tool*. Policy and Society, 37(3), 277-293. https://doi.org/10.1080/14494035.2018.1521676

Taherdoost, H. (2017). Decision making using the analytic hierarchy process (AHP); A step by step approach. International Journal of Economics and Management Systems.

Thomas, M. A., Cipolla, J., Lambert, B., & Carter, L. (2019). *Data management maturity assessment of public sector agencies*. Government Information Quarterly, 36(4), 101401-101413. https://doi.org/10.1016/j.giq.2019.101401

Torii, T., & Okada, Y. (2017). *Achieving Evidence-Based Improvement and Transparency in Higher Education: The Current Status and Challenges Regarding Data Utilization and Disclosure in Japan*. Higher Education Forum, (Vol. 14, pp. 35-49). Research Institute for Higher Education, Hiroshima University.

Transparency International. (2024). *Corruption Perceptions Index*. Retrieved from https://www.transparency.org/en/cpi/2024

United Nations. (2024). *E-Government Survey 2024. Department of Economic and Social Affairs, United Nations*. Retrieved from https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2024

Valdés, G., Solar, M., Astudillo, H., Iribarren, M., Concha, G., & Visconti, M. (2011). *Conception, development and implementation of an e-Government maturity model in public agencies*. Government Information Quarterly, 28(2), 176-187. https://doi.org/10.1016/j.giq.2010.04.007

Veljković, N., Bogdanović-Dinić, S., & Stoimenov, L. (2014). *Benchmarking open government: An open data perspective*. Government Information Quarterly, 31(2), 278-290. https://doi.org/10.1016/j.giq.2013.10.011

Wang, D., Richards, D., Bilgin, A. A., & Chen, C. (2022). *The Development of Open Government Data: Connecting Supply and Demand Through Portals.* Emerald Publishing Limited.

Williams, A. (2015). *A global index of information transparency and accountability*. Journal of Comparative Economics, 43(3), 804-824. https://doi.org/10.1016/j.jce.2014.10.004

Zhao, X., Huo, Y., Abedin, M. Z., Shang, Y., & Alofaysan, H. (2025). *Intelligent government: The impact and mechanism of government transparency driven by AI*. Public Money & Management, 1-12. https://doi.org/10.1080/09540962.2025.2500093

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Zheng, L., Kwok, W.-M., Aquaro, V., Qi, X., & Lyu, W. (2020). Evaluating global open government data. In *Proceedings of the 13th International Conference on Theory and Practice of Electronic Governance*, (pp. 381–391). ACM.

Zuiderwijk, A., Gascó, M., Parycek, P., & Janssen, M. (2014). *Special issue on transparency and open data policies: Guest editors' introduction*. Journal of theoretical and applied electronic commerce research, 9(3), 1-9.

Zuiderwijk, A., Helbig, N., Gil-García, J. R., & Janssen, M. (2014). *Special issue on innovation through open data-A review of the state-of-the-art and an emerging research agenda: Guest editors' introduction.* Journal of theoretical and applied electronic commerce research, 9(2), 1-13.

Author Contributions

Both authors collaborated on the conceptualization, methodology, investigation, and formal analysis. Ratsuda Sakolkittinapakul managed data curation, visualization, and initial drafting, while Asst. Prof.Dr.Sotarat Thammaboosadee led manuscript revision and editing. All authors have read and approved the final manuscript.

About the Authors

Ratsuda Sakolkittinapakul

PhD student at Information Technology Management Program, Faculty of Engineering, Mahidol University, Thailand and she also has worked as accounting and financial system consultant. She had master's degrees in business administration from Panyapiwat Institute of Management, Thailand. Her research focuses on transparency assessment.

Sotarat Thammaboosadee

Assistant Professor and Assistant Dean for Organisational Digital Transformation at the Faculty of Engineering, Mahidol University, Thailand. He received his doctoral degree in Information Technology from King Mongkut's University of Technology Thonburi (KMUTT), Thailand. His research focuses on Artificial Intelligence Governance, Data Governance, Data Protection Law and Compliance, Data Science, and Health Informatics. His recent research works have been published in leading international journals such as IEEE Access, Results in Engineering, International Journal of Advanced Computer Science and Applications, International Journal on Advanced Science, Engineering and Information Technology, and Cogent Social Sciences. He actively contributes to both academic and government sectors as an expert fellow in AI governance, data governance, and data protection professional roles. Asst. Prof. Dr. Sotarat Thammaboosadee is the corresponding author and can be contacted at: sotarat.tha@mahidol.ac.th

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Appendix

Table A1 Expert profiles.

ID	Education level			Job position level			Work experience (years)	Representative role	
	Master's degree	Doctor of Philosophy	Aca-demic	Senior	Middle	Project		Publisher	User
1		✓	✓				20	✓	
2		✓	✓				23	✓	
3	✓					✓	7		✓
4	✓		✓				12	✓	
5		✓		✓			35		✓
6	✓			✓			16		✓
7	✓				✓		20		✓
8		✓				✓	10		✓
9		✓	✓				26	✓	
10		✓	✓				4	✓	
11	✓		✓				20	✓	
12	✓		✓				8	✓	
13	✓		✓				4	✓	
14		✓				✓	15		✓
15		✓	✓				10	✓	
16	✓			✓			22		✓
17		✓				✓	19		✓
18	✓					✓	3		✓

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Table A2 TAM-OGD metrics.

Domain	Sub domain	Level	Desirability Metric	Scoring thresholds
Policy	Resource allocation	0	None of the resources were allocated to initial OGD implementation or transparency mechanisms.	0-17
		1	Partial resources were allocated to the OGD implementation (either financial or human resources).	18-36
		2	Financial and human resources were restricted in the initial OGD implementation, remaining insufficient for the transparency mechanism.	37-61

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

Domain	Sub domain	Level	Desirability Metric	Scoring thresholds
		3	Either financial resources or human resources were sufficient[1] for the transparent OGD.	62-75
		4	Both financial and human resources were sufficient for the transparent OGD.	76-100
Policy	Policy alignment	0	None of the operational strategies focused on transparent OGD.	0-20
		1	Incomplete operational strategies of transparent OGD lacked alignment with the national policies.	21-34
		2	Incomplete operational strategies of transparent OGD aligned with the national policies.	35-49
		3	Complete operational strategies of transparent OGD partially aligned with the national policies.	50-63
		4	Complete operational strategies absolutely aligned with the national strategies.	64-100

Domain	Sub domain	Level	Desirability Metric	Scoring thresholds
Policy	Open data governance	0	None of the open data governance committees had been established.	0-16
		1	Open data governance committees had been informally[2] established.	17-36
		2	Open data governance committees had been formally[3] established.	37-61
		3	Data governance committees used electronic systems for data management.	62-79
		4	Data governance committee consistently refined its governance processes.	80-100
Dataset	Quantity	0	OGD was not made publicly accessible.	0-14
		1	Transparency-related datasets[4] were not made publicly available.	15-34

[1] The sufficient resources encompassed both an adequate volume for the task and the required qualitative competencies (Hausladen & Schosser, 2020).

[2] Informal status operated without official documentation or established protocols.

[3] Formal status operated under practices codified through administrative channels, such as written directives, official announcements, or departmental orders issued by unit leadership.

[4] There were three types of transparency-related datasets, including (1) task capacity, (2) agency's aims, and (3) stakeholder environment (Douglas & Meijer, 2016).

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

		2	Only a single category of transparency-related datasets was made publicly available.	35-53
		3	Two categories of transparency-related datasets were made publicly available.	54-73
		4	Three categories of transparency-related datasets were made publicly available.	74-100
Dataset	Metadata	0	OGD lacked standardized metadata[5].	0-15
		1	OGD was accompanied by minor metadata, containing only 1 to 2 attributes.	16-34
		2	OGD was accompanied by moderate metadata, containing 3 to 7 attributes.	35-53
		3	OGD was accompanied by major metadata, containing 8 to 11 attributes.	54-71
		4	OGD was accompanied by complete metadata, containing 12 to 14 attributes.	72-100

Domain	Sub-domain	Level	Desirability Metric	Scoring thresholds
Dataset	Coloring	0	OGD lacked any data-coloring list[6].	0-17
		1	OGD disclosure encompassed only the data-coloring list.	18-34
		2	OGD disclosure encompassed the minority of data-coloring lists (2 lists).	35-53
		3	OGD disclosure encompassed the majority of data-coloring lists (3-4 lists).	54-72
		4	OGD disclosure encompassed the completeness of data-coloring lists (5 lists).	73-100
Dataset	Openness	0	OGD disclosure lacked any openness characteristics[7].	0-17
		1	OGD disclosure encompassed a minority of openness characteristics (1-2 lists).	18-38

[5] Complete metadata attributes primarily comprised dataset type, dataset title, ownership, coordinator name, coordinator e-mail, keywords, purpose, update frequency, description, coverage, its resource, file format, category, and licensing (Data Governance for Government B.E. 2563, 2020).

[6] Five data-coloring lists comprised (1) the achievement information, (2) failure details, (3) stakeholder perspectives, (4) optional approaches, and (5) expected future trends (Douglas & Meijer, 2016).

[7] There were ten openness characteristics, including (1) primary, (2) timeliness, (3) accessibility, (4) machine readability, (5) non-discriminatory, (6) non-proprietary format, (7) URIs, (8) linked data, (9) completed dimension, and (10) license (Digital Government Standard: Open Government Data Guideline B.E. 2563; Reggi, 2011; Silva & Pinheiro, 2018; Veljković et al., 2014).

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

		2	OGD disclosure encompassed moderate openness characteristics (3-5 lists).	39-56
		3	OGD disclosure encompassed the majority of openness characteristics (6-8 lists).	57-75
		4	OGD disclosure encompassed completeness of openness characteristics (9-10 lists).	76-100
Portal	Dataset exploration	0	The portal lacked any list of dataset exploration[8].	0-8
		1	The portal provided only a list of dataset exploration.	9-26
		2	The portal provided minor lists of dataset exploration (2-3 lists).	27-48
		3	The portal provided major lists of dataset exploration (4 lists).	49-63
		4	The portal provided complete lists of dataset exploration (5 lists).	64-100

	domain		Desirability Metric	thresholds
Portal	Dataset request	0	The portal lacked any list of dataset request functions[9].	0-8
		1	The portal provided only a list of dataset request functions.	9-29
		2	The portal provided minor lists of dataset request functions (2 lists).	30-48
		3	The portal provided major lists of dataset request functions (3 lists).	49-74
		4	The portal provided complete lists of dataset request functions (4 lists).	75-100
Portal	User feedback	0	The portal lacked any user feedback functions.	0-8
		1	The portal provided only a user feedback function, containing an input opinion channel.	9-29
		2	The portal provided minor user feedback functions, containing an input opinion channel with displaying opinions for users.	30-48

[8] Five lists of dataset exploration included searching and filtering, dataset categories, visualization, version history, and guideline documentation (Lněnička & Nikiforova, 2021.

[9] Dataset request functions comprised request form, request status, responsible staff, and dissemination of the requested dataset (Nikiforova & McBride, 2021).

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026

		3	The portal provided major user feedback functions, containing an input opinions channel with tracking and responding to opinions users.	49-68
		4	The portal provided complete user feedback functions, containing officially designated personnel for process improvement.	69-100
Account-ability	Executive support	0	Complete absence of executive sponsorship for transparent OGD.	0-24
		1	Transparent OGD operations maintained through informal manager support.	25-43
		2	Transparent OGD operations maintained through formal manager support.	44-57
		3	Transparent OGD operations were sustained through informal executive support.	58-72
		4	Transparent OGD operations were sustained through formal executive support.	73-100

domain				thresholds
Account-ability	Communi-cation	0	Complete absence of public communication for transparent OGD.	0-24
		1	One way of informal communication regarding transparent OGD occurred.	25-41
		2	One way of formal communication regarding transparent OGD occurred.	42-56
		3	Informal information exchange of transparent OGD occurred.	57-73
		4	Formal information exchange of transparent OGD occurred.	74-100
Account-ability	Imple-mented process	0	The OGD process was defined informally without standardized procedural guidelines.	0-24
		1	The OGD process was defined formally without standardized procedural guidelines.	25-41
		2	The OGD process was documented formally with standardized procedural guidelines.	42-56
		3	The quantitative and qualitative indicators of the OGD process were evaluated.	57-73
		4	The OGD process was consistently refined in its performance.	74-100

 CC BY-NC 4.0 DEED Attribution-NonCommercial 4.0 International, 2026