

Conceptual Framework on Open Government Data Usage and Work Productivity Among Public Sector Managers in Malaysia

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Abstract. The intent of this study was to investigate and comprehend the usage of open government data (OGD) and to take a look at the ways those roles affect public sector managers' work productivity. Regardless of its novel reputation in the usage of OGD literature, past research has revealed that Malaysian public sector organisations have not entirely embarked on user OGD initiatives extensively. The main feature to note is that the data and information collected, maintained and kept by the government are national assets. The conceptual structure is composed of up of five independent variables: system quality, information quality, data availability, trust factor and voluntariness as well as two dependent: OGD usage and work productivity. There were six proposed hypotheses developed. The well-designed research notion provides the researcher with adequate trust to proceed to examining variables such as research design and data collection technique. It is believed that this proposal will enlighten relevant information on user of OGD among public manager and overall public sector ecosystem.

Keywords: Open data, open government data, work performance, public sector manager, public sector, knowledge management.

1 Introduction

The Malaysian Administrative Modernization and Management Planning Unit (MAMPU) established and launched the Public Sector Open Data Portal (data.gov.my). The portal performs the role of a One Service Center, accessing and downloading online public data to share data with several users' types, improve the openness of government services, and give users a digital platform to receive information from the official sources of the government and to provide opinions. Malaysia has taken the initial steps

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toward changing from a consumer nation to a well-educated, a high-income, data-driven producing nation which leverages information to support decisions. Increased data implies more opportunities for growth and original thought or innovation. To make this happen, however, users—including those in the private sector, academics, and stakeholder must accept OGD in order to support both the government and their own interests as beneficiaries.

OGD may increase the effectiveness of public administrations, promote private sector economic growth, establish new data-driven goods, and contribute to public policy-making, thereby facilitate to benefit the general stakeholders. Contemporary study has focused about how OGD is accepted and utilized by the public, commercial sector, and governmental bodies (Zuiderwijk, Janssen, & Dwivedi, 2015). However, given Malaysia's dearth of understanding surrounding OGD initiatives and utilization, this phenomenon needs to be addressed. The majority of them view data as being insignificant and ordinary. Furthermore, OGD in Malaysia is still in its infancy, which creates numerous obstacles and difficulties during the application stage. According to previous studies, there are obstacles centered on technical, behavioural, and legal aspects of OGD. However, this study only examined technological and behavioural obstacles from the viewpoint of the public sector managers as OGD users.

Inconsistent information and format standards, as well as high resource and talent demands, are examples of technological barriers. Users could not be conscious of all the ways that data can be used. Other challenges include issues with job complexity, such as a lack of metadata or a challenge finding data, or deficiencies in the quality of the information (Janssen, Charalabidis & Zuiderwijk, 2012). The amount of OGD use is significantly influenced by data quality. Accuracy, timeliness, accessibility, and understandability are similar ways to characterize data quality (Zhao, & Fan 2021). Data quality problems such as metadata compliance, duplication, consistency, and completeness of values are among the issues revealed by dataset analysis. Users will misunderstand data, find it difficult to acquire raw data, and find it difficult to process it if there is uncertainty concerning the quality of the data.

The user's willingness, competency, and intention to use OGD will be influenced by the complexity of the data. The fact that the data has been published in ODP does not guarantee that consumers will take advantage of it. The primary OGD's success is determined not by the volume of data but rather by the adoption and acceptance of OGD. Data providers will make their data available to the public, however quite few datasets are being downloaded (Zuiderwijk, Janssen, & Dwivedi, 2015). This problem is a result of user behaviour including a lack of time, interest, and support from data suppliers in resolving background information. In addition, users may encounter obstacles to OGD usage due to a lack of knowledge and technical capabilities. In accordance with the OD Barometer's data, Malaysia's adoption of OGD is still quite low.

Despite the MAMPU's efforts, such as the introduction of the Public Sector Open Data Portal, the OD Barometer report claims that there has been little progress in the public sector regarding the publication of data (data.gov.my). A majority of Malaysian government agencies presently are entitled to open knowledge and are cognizant of open data. The OD Barometer's results, however, show that users are not utilizing OGD

to their full potential. Therefore, research on the causes of the poor usage of OGD and the variables that might have an impact on users' adoption of OGD in Malaysia is necessary. In order to maximize open data adoption and help the nation reach its goal of becoming an open society, OGD adoption challenges must be resolved.

Beside above point, a closer look at the evidence reveals a number of gaps and shortcomings research activities. Only a few qualitative case studies have explored how relationships between OGD actors such as user are likely to develop to this date and only a few of these studies have investigated at the potential drivers of OGD development (Slobodova & Becker, 2020). This drawback is acknowledged by de Souza, d'Angelo, and Lima Filho (2022), that OGD studies primarily utilise qualitative research methods and less quantitative measures.

Furthermore, most studies on OGD are conducted in Western settings, with only a few studies conducted in developing countries. This body of literature concentrates on case research conducted countries where OGD initiatives have been executed at the national, state, or local levels (Liu et al., 2015). Therefore, research on the causes of the low utilisation of OGD and the variables that can have an impact on usage of OGD in Malaysia is necessary. In order to promote usage of OGD and help the nation reach its goal of being an open country, OGD issues must be resolved (Husin, Zakaria, & Dahlan, 2019).

Considering the probable advantages for the policies making development from OGD, a number of nations have dedicated funds and resources to the development of technical infrastructures and the creation of OGD portals, which improve public data accessibility (Nikiforova & McBride, 2021) which include Malaysia as well. Despite the fact that OGD is now more accessible, previous studies has demonstrated that usage of OGD is currently low in practice and that few organizations are employing OGD due to lack the resources, competence, and opportunity necessary to further utilize the datasets. OGD rests on its related purposes, which become extremely beneficial when users understand how to use them, as opposed to having limited value in and of themselves (Ruijer, Porumbescu, Porter, and Piotrowski, 2023; Chen, Cao, & Liang, 2023). Consequently, an additional review of OGD use, from which value stems, will be needed to figure out whether OGD meets its expectations (Begany, & Gil-Garcia, 2021). This previous research and report warrant voluntariness aspect of OGD user from public sector manager to be investigated.

2 Literature Review

OGD initiative has been valued by various governments as a critical policy around the world and in general it refers to the opening government-related data to the stakeholder which include public, social agencies or business affiliation. According to Ruijer group (2023) OGD has been associated with three main exercise which is to promote transparency and accountability measure on government operation, public deliberation on policy alternatives, and public concerted on government services activities. Beside the potential to prevent corruption and accountability of government operations that OGD

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is acknowledge of, other crucial benefit is the cocreation of new and innovative services, allows for new services to be created by external, and Zhao and Fan (2021) provide public with more information to capacitate them make better decisions. Hence, the ultimate value of OGD initiatives is dependent on usability of OGD by universal participation highlighted by OECD report.

Many governments have taken proactive measures to increase their data availability and productivity. However, the pertinent challenges are to increasing stakeholders' interest in using OGD. It has been shown in Susha et al., 2015 that the challenges in the data publication constitute key element but still important difficulties are also experienced on the side of data users inside and outside government. The general challenges associated with user of OGD include lack of knowledge to make sense of the data (Janssen et al., 2012), lack of user-centred design platforms (Zuiderwijk, Janssen, & Dwivedi, 2015), not have the required related technical skills, awareness of existence of OGD platform (Martin, & Begany, 2018), understanding of OGD practice (Kawashita, Baptista, & Soares, 2022). and lack of trust and confidence in OGD (Ruijer et. al, 2023). Furthermore, these challenges are associated with an unfamiliar idea to use OGD for service delivery system by public sector manager.

OGD is crucial to organisations such as the public institutions, thus exploring the determinants that effect the OGD extension perceived as important due to public sector managers which had been recognised as the main agents of OGD. This unique understanding on public sector managers usage of OGD including intention behaviour is an intricate circumstance that need more advance model. Furthermore, comprehensive guide toward strengthens the significance and predictably of the results derive from OGD would enhance the public institution competitive advantages and innovation capability. Besides, public institutions play major role in developing and provides valuable information freely without limitations or restrictions thru OGD initiative to the public at large and not restricted within the borders of public sector.

In recent years OGD initiative has emerged as a particularly attractive technology for Malaysia government to improve public service delivery performance. However, previous studies conducted in the public sector is biased toward administrative issues such as data collection, enacting relevance law on public information and formulating regulatory constraints. Beside provide high-quality data availability, the data made available to the public are underutilized.

Since 2014, the Malaysian government has begun its road toward open data. Malaysia Administrative Modernization and Management Planning Unit (MAMPU), a key organisation under the Prime Minister Department, is in charge of overseeing national projects and setting the global agenda. According to the Open Data Barometer's report, Malaysia's OGD usage is still relatively low (Husin, Zakaria, & Dahlan, 2019). In comparison to Korea and Indonesia, which is positioned higher, Malaysia is currently in position 53 for 2016 and is not on the list for 2017 (Husin, Zakaria, & Dahlan, 2019). Despite MAMPU's measures, such as the establishment of the Public Sector Open Data Portal, there has been relatively little development in the public sector's data dissemination, according to the OD Barometer survey (data.gov.my). Almost all Malaysian

public institutions currently have access to open knowledge and are aware of OGD (Husin, et. al, 2019).

In the Twelfth Malaysia Plan 2021-2025 (12th MP) report, a total of 12,632 data sets were published in the Public Sector Open Data portal in accordance with the Open Government initiatives to make information available to the general public. The OGD is expected to promote inter-agency data exchange and increase the value of the data in order to empower the data-driven government, which is a continuation from the Eleventh Malaysia Plan 2016-2020 (11th MP) report. The creation of value from OGD is largely underappreciated. As a result, the Malaysian government's open data sharing infrastructure would be enhanced to allow digital information to be accessed by the public and private sectors, academics, and general public. In the meantime, norms and regulations on personal data protection and data sharing will be reinforced to protect data from cyber-attacks and immoral uses. To ensure responsible use of technology, an ethical framework and standards for technology development, implementation, and utilisation will be created.

According to the Public Sector Digitization Strategic Plan 2021–2025 (PSPSA 2021–2025), the Malaysia Open Data User Group (MODUG) was established on November 14, 2017, as a Special Interest Group for Open Data, bringing together data providers and users from government organisations, academic institutions, businesses, non-governmental organization (NGO) and related stakeholder.

In order to produce variety of data innovations, whether in the form of applications, data products or research, OGD platform has established an open data ecosystem that links data owner organisations with open data consumers, which includes government organisations, academia, industry, and individuals. Through accurate, timely, and appropriate data sharing, the government especially Malaysian Government may improve the transparency of government service delivery. Additionally, by involving citizens and the business community in new sectors or innovations, the government can boost the productivity of the nation's digital economy. With this move, Malaysia is now on par with other nations participating in the Digital Government project.

The fact that OGD in Malaysia is still in its early stages, which creates numerous obstacles and difficulties throughout the implementation phase. According to previous studies, the obstacles and difficulties are centred on individual behavioural aspects of OGD. These obstacles include inconsistent information and formats, high resource and expertise needs issues with the complexity of the activity, such as a lack of metadata, difficulties finding data, or poor information quality, lack of time and interest in resolving background information, lack of help from data providers will result in users misinterpreting data, having difficulty accessing raw data, and having trouble processing available data, lack of knowledge and technical abilities may also act as a deterrent to users' adoption of OGD.

Furthermore, a government institution with an open, innovative, and risk-taking mindset is more likely to encourage OGD practise among its members and increase productivity well (Martin & Begany, 2018). Two critical factors in the execution and performance generation of OGD among public sector managers are law and policy linked to OGD. Because OGD is a complex undertaking that includes data licensing,

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data reuse, data ownership, personal privacy, data security protection, and possible liability due to data usage, specific laws and regulations must be created. According to some research, the legal and policy viewpoint is the most important factor that government agencies evaluate (Ruijer et. al, 2023). As a result, users use these data sets to improve their businesses or professional success in addition to providing significant contributions to these data sets. Implicitly, the OGD is known to foster invention through cooperation between the government and users.

Scholars are currently interested in the research of OGD adoption. The OGD adoption research, like any other invention or technology, can be investigated using a variety of approaches and theories. References to prominence scholar that look at the variables affecting OGD usage from the government's perspective, while research from other examines at it from the private organization's perspective. From the viewpoint of data users, the research by Zuiderwijk, Janssen, and Dwivedi, (2015) determined factors that influenced data users to embrace OGD. Other researcher investigated the sociotechnical determinants of open data release in Taiwanese government organizations using a variety of theories.

Researchers adopt theories and models linked to that goal in measuring behavioural to use technologies. Many research has employed the Theory of Acceptance Model (TAM), Theory of Planned Behaviour (TPB), and Theory of Reasoned Action (TRA) to identify the factors affecting the adoption of technology. Moreover, the Information System Success Model (ISSM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) are relevant theories being studied to determine the way individuals behave when using technology.

3 Proposed Framework Development

As independent factors in this research, five factors of the OGD usage were identified: System Quality, Information Quality, Data Availability, Trust Factor and Voluntariness on OGD Usage. Meanwhile, Work Productivity is the contingent factors. This part is based on different journals and articles to develop the important variables of the research that are related to the conceptual framework. It is critical in nature and concentrates on the idea of variables from the standpoint of prior studies. This chapter concluding with the development of the research framework for independent and dependent variables. In that situation, the suggested framework is intended to establish a complete scheme for further study.

3.1 Effect of System Quality

System quality is defined as the absence of bugs, the uniformity of the user interface, simplicity of use, documentation quality, and maintainability. Some researchers, like Earlier studied emphasised that system quality measures how well a system handles information from an engineering perspective. System quality, on the other hand, was described as a characteristic associated with system effectiveness that is assessed by

human perceptions. However, that system quality has no meaningful connection with OGD use from the developers' and journalists' viewpoints. Yet, earlier studies showed that the willingness to utilise an e-filing tax system has a significant link with system quality. According to Wang, Cao, and Yang (2010), one of the key elements influencing user trust in the setting of e-commerce is system quality which is similar to OGD setting. On the contrary, other reports emphasised that trust allows users to think that e-government can provide the finest service possible. However, Wang, et al. (2010) stated that the presence of system quality, such as dependability and quickness of access, can enhance users' confidence in e-government. Similarly, local studies stated that system quality is likely to increase customer faith in the system such as OGD. This is confirmed by the results of another research by Mohammadi (2015), which revealed that system quality is crucial and needs further investigation.

3.2 Effect of Information Quality

Information quality is defined as the calibre of knowledge provided by an information technology. Several researchers have examined the quality of information in the context of open data as of the present. These investigations of similarity highlighted a few common characteristics of information quality. In another report showed how information quality and trust are strongly correlated in the context of e-government. According to Wang, et al. (2010), the public evaluates the accuracy and thoroughness of the e-government system and the quality of the material in their report. Earlier studies showed that information quality can increase trust in the OGD platform as a result. Additionally, high-quality information should have an impact on trust. Researchers modified the ISSM to evaluate the quality factors that influence the willingness to utilise OGD in the context of open government data. They emphasised how important it is to employ OGD for its accuracy, relevance, quantity, and authenticity.

3.3 Effect of Data Availability

Researchers discovered that data access is a critical factor influencing OGD (Janssen et al., 2012). This also agreed with another group of researchers who stated that prior studies from the viewpoint of public big data providers emphasised the role of data availability management or indicated the need for offering customised data to respond to user requirements. Concerns about data access also impede the use of OGD (Ruijter et al., 2023). According to researchers, usability is directly related to data availability issues, which drive lack of participation with OGD, for example, if data quality is low and unusable, there is no desire to work with OGD, and if there is no desire to work with OGD, there is no need to make it usable, and so on. Data access is limited due to incompleteness, accuracy, and other problems associated with its initial gathering (Martin & Begany, 2018).

3.4 Effect of Trust Factors

Beside trust in government, trust in technology have been demonstrated to be critical success elements in e-government usage. Previous studies contend that people are more likely to use e-government services when they have faith in technology. Furthermore, the trusted party is also expected to behave morally in public in order to live up to expectations set by both parties. Previous studies found a negative correlation between the desire to use open data and internet confidence. Trust in government and confidence in technology both greatly impact trust in the OGD website in the context of open data. There are two different kinds of trust: trust in technology and trust in institutions of power or the government. Users' opinions on the government entity that provides services to the nation might be characterised as their level of trust in it. A strong government-nation relationship can also increase people's trust in the government (Wang, Cao, & Yang) (2010). People are more inclined to trust the government in the context of OGD if they think it can keep its promises to provide them with the greatest service. Similarly, if consumers think that internet technology is secure, they are more inclined to trust the open data website. In general, trust in open data can be defined as a shared belief in the trustworthiness of government agencies and technology. In the OGD context, there is a significant link between trust and the open data website. This is also consistent with previous research in fields such as e-government and online banking.

3.5 Effect of Voluntariness

Voluntariness is suggesting the extent to which individuals believe that implementing and complying with open data technologies is voluntary or of their own accord, and that people are more inclined to accept and make use of OGD technologies if they are used without any obligation. Hassan and Abeam (2020) showed that the voluntariness of use is about individual willingness to utilize something reflects their readiness as user is to start utilizing new technologies for work productivity, such as employing OGD. According to some researchers, voluntariness of use broadens the model's scope and increases its potential for use in different contexts. Sadly, the literature particularly in the setting of OGD currently lacks of investigations that have looked into the interaction between different aspects on voluntariness of use and actual use behaviour. Previous research reported that OGD platform must provide what many social media users consider the ability to engage, interact, and establish a reputation online to be sufficient compensation to attract voluntariness among user. In addition, Izuagbe group (2019) asserted that even in a forced context, OGD users would not be coerced into using a system if they directly experience its flexibility and efficiency potential. In the context of government setting, public sector manager whose consider social media usage to be optional is thus described as voluntariness. This statement concurred with report done by Izuagbe et. al (2019) for librarians. Despite the aforementioned, Izuagbe et. al (2019) further mentioned that there are a number of reasons why user can be reluctant to utilize social media, even if doing so is required by their organization and this worried if the same behavioural in the usage of OGD within government sector.

3.6 Effect of OGD Usage on Work Productivity

In particular, the role of Government Institution and its members is being emphasized more because it is essential toward delivery system to the public or other stakeholder and in need to maximize the productivity, and efficiency utilising new technology such as OGD. According to Park, Kim, and Jun (2022), when most important data sources are heavily siloed, or data collected from disparate sources are unstructured, it thus causing productivity lags. Furthermore, it is believed that service delivery made by the member of government institution can achieve productivity improvement using OGD only if they cannot only simply acquire the data, but also reprocess data (Park, Kim, & Jun, 2022). Previous report made for private sector shown firms defined as being ‘data-driven’ were on average five per cent more productive than their competitors. Other scholars concurred in governments are increasingly aware of how the better use of data can support a response to unpredictable challenges and create policy on evidence-based, while also improving the productivity, performance and inclusiveness of policies and services. Better integration and analysis of current, diverse, and comprehensive performance data could boost public sector output by allowing policy reviews to shift from one-time judgements in the moment to more continuous performance development.

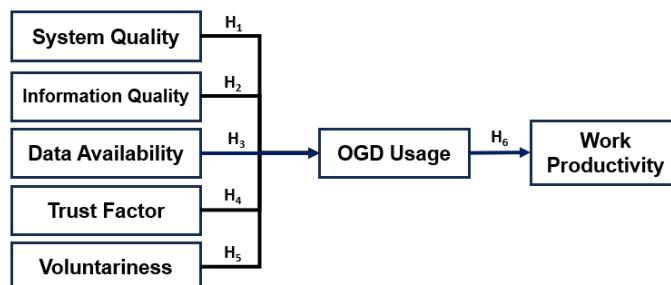


Figure 1: Conceptual framework

Figure 1 suggests the effect of independent variables, namely System Quality, Information Quality, Data Availability, Voluntariness and Trust Factor on the dependent variables, namely OGD Usage and Work Productivity. As mentioned in above chapter, selected independent variables have meaningful connection with OGD use. Firstly, Wang, et. al, (2010) concurred that the presence of system quality, such as dependability and quickness of access, can enhance users' confidence in e-government. Wang, et. al (2010) further continue that the individual evaluates the accuracy and thoroughness of the e-government system and the quality of the material presented. High-quality information should have an impact on trust with modified the ISSM to evaluate the quality factors that influence the willingness to utilise OGD with emphasised on OGD for its accuracy, relevance, quantity, and authenticity. Furthermore, usability is directly related to data availability issues. If data quality is low and unusable, there is no desire to work with OGD, and if there is no desire to work with OGD, there is no need to make it usable, and so on. Next, people are more inclined to trust the government in the context of OGD if they think it can keep its promises to provide them with the greatest service. In the OGD ecosystem, trust and the open data website are reported to have

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strong link. Finally, in the event of forced context, OGD users would not be coerced into using a system if they directly experience its flexibility and efficiency potential. Thus, above statement has warrant research to be conducted and showed how selected independent variables related to OGD usage and Work Productivity. As far as the OGD Usage variable is concerned, the researcher intends to investigate the level of influence of factors on Work Productivity.

4 Conclusions

In conclusion, the above proposed framework will be tested and scrutinized for it worthy to serve as a guide and facilitation in understanding OGD user among public manager. Thus, concurred with the masterplan provide by MAMPU that spearhead the OGD or open data for the Malaysia public consumption. The framework is exhaustive and incorporates all essential and fundamental OGD user practices components. The framework is intended to ensure the application of the most effective OGD user methods. By using this approach, organizations will be able to attract, develop, and retain outstanding individuals, contributing to their long-term success, viability and productivity.

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