

## Barriers to Openly Sharing Government Data Towards an Open Data-adapted Innovation Resistance Theory

Nikiforova, Anastasija; Zuiderwijk, Anneke

**DOI**

[10.1145/3560107.3560143](https://doi.org/10.1145/3560107.3560143)

**Publication date**

2022

**Document Version**

Final published version

**Published in**

Proceedings of the 15th International Conference on Theory and Practice of Electronic Governance, ICEGOV 2022

**Citation (APA)**

Nikiforova, A., & Zuiderwijk, A. (2022). Barriers to Openly Sharing Government Data: Towards an Open Data-adapted Innovation Resistance Theory. In L. Amaral, D. Soares, & L. Zheng (Eds.), *Proceedings of the 15th International Conference on Theory and Practice of Electronic Governance, ICEGOV 2022* (pp. 215-220). (ACM International Conference Proceeding Series). Association for Computing Machinery (ACM). <https://doi.org/10.1145/3560107.3560143>

**Important note**

To cite this publication, please use the final published version (if applicable).  
Please check the document version above.

**Copyright**

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

**Takedown policy**

Please contact us and provide details if you believe this document breaches copyrights.  
We will remove access to the work immediately and investigate your claim.

***Green Open Access added to TU Delft Institutional Repository***

***'You share, we take care!' - Taverne project***

***<https://www.openaccess.nl/en/you-share-we-take-care>***

Otherwise as indicated in the copyright section: the publisher is the copyright holder of this work and the author uses the Dutch legislation to make this work public.

# Barriers to Openly Sharing Government Data: Towards an Open Data-adapted Innovation Resistance Theory

Anastasija, AN, Nikiforova

University of Tartu, Faculty of Science and Technology,  
Tartu, Estonia

Nikiforova.Anastasija@gmail.com

Anneke, AZ, Zuiderwijk

Delft University of Technology, Faculty of Technology,  
Policy and Management, Delft, Netherlands

a.m.g.zuiderwijk-vaneijk@tudelft.nl

## ABSTRACT

Open Government Data (OGD) is a fundamental source for sustainability-oriented and data-driven innovation by citizens, companies, and other actors. However, many government agencies are reluctant to openly share their data with the public. While the resistance of public organizations to openly share government data has been investigated in previous research, most of these studies are focused on the reuse of open government data by companies and citizens. There is a paucity of research applying theoretical models to study the provision of OGD, and more specifically, the resistance of public organizations to make government data publicly available. We argue that Innovation Resistance Theory (IRT), which considers both functional and psychological factors, can be used to study OGD barriers, where OGD is seen as a source of innovation. This study aims to develop an OGD-adapted IRT model to empirically identify predictors affecting public agencies' resistance to openly sharing government data. Based on a review of the literature on both IRT research and barriers associated with open data sharing by public agencies, we develop an initial version of the model. In our future research, we plan to conduct exploratory interviews in multiple countries to refine the model. Ultimately, we will validate the refined model to study the resistance of public authorities to openly sharing government data in a quantitative study.

## CCS CONCEPTS

• **Government technology policy**; • **Computing / technology policy**; • **Social and professional topics**;

## KEYWORDS

Open Government Data, Innovation Resistance Theory, Open data, OGD, Barrier

### ACM Reference Format:

Anastasija, AN, Nikiforova and Anneke, AZ, Zuiderwijk. 2022. Barriers to Openly Sharing Government Data: Towards an Open Data-adapted Innovation Resistance Theory. In *15th International Conference on Theory and Practice of Electronic Governance (ICEGOV 2022)*, October 04–07, 2022, Guimarães, Portugal. ACM, New York, NY, USA, 6 pages. <https://doi.org/10.1145/3560107.3560143>

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org).

ICEGOV 2022, October 04–07, 2022, Guimarães, Portugal

© 2022 Copyright held by the owner/author(s). Publication rights licensed to ACM.

ACM ISBN 978-1-4503-9635-6/22/10...\$15.00

<https://doi.org/10.1145/3560107.3560143>

## 1 INTRODUCTION

Open Government Data (OGD) is considered an essential source for sustainability-oriented and data-driven innovation by citizens, companies, researchers, and public organizations [1–3]. OGD are structured, machine-readable data that governments collect and actively publish on the internet with the aim to have the data freely reused by the public without restrictions [4–6]. Using OGD, companies are expected to create new, innovative products and services [2, 3]. Moreover, researchers may use publicly available data to combine various datasets, test new hypotheses, develop models (e.g., the SARS-CoV-2 transmission model [7]) and derive ground-breaking insights [8–10]. Furthermore, public organizations may reuse other public agencies' OGD, which could stimulate collaboration and knowledge exchange [11, 12].

In the past two decades, research on OGD has started to thrive. In particular, many studies on the drivers and inhibitors for the adoption of OGD have been conducted [e.g., 2, 3], both from the data providers' and data users' perspectives. From the data user perspective, the acceptance of OGD by different user types has been investigated using various theoretical models. For example, the Technology Acceptance Model (TAM) has been used to examine the determinants of OGD use [13], the Unified Theory of Acceptance and Use of Technology (UTAUT) has been used to study the behavioural intention to accept and use OGD in different countries (India, Czech Republic, Latvia, Bangladesh) [14–16], and gamification theory has been applied to examine how playful interfaces can help tailor OGD portals for lay citizens [17]. Several other studies focused on the perspective of the OGD provider, i.e., the public organizations, in their resistance to openly sharing government data. For example, Wang & Lo [18] used the Technology–Organization–Environment (TOE) to investigate factors influencing the adoption of OGD among government agencies and Hossain et al. [19] proposed a model that incorporates seven context-specific TOE variables to understand the underlying factors that influence OGD initiatives.

Although various studies have applied theoretical models to investigate open data, most of them are focused on the reuse of these data by companies and citizens e.g., [13, 20]. There is a paucity of research applying theoretical models to study the provision of OGD, and more specifically, the resistance of public organizations to make government data publicly available. Moreover, most studies on OGD barriers were carried out before the COVID-19 pandemic. However, previous research on OGD in relation to COVID-19 suggests that the pandemic affected the mind-set of citizens, researchers, and governments on the role of OGD and the benefits of these data for these stakeholders [9, 10, 21, 22]. Previous research suggests that the behavioural patterns of both OGD users and, more importantly, OGD providers may have changed their attitude towards OGD,

perhaps moving towards a more open paradigm. At the same time, several new issues were identified because of a more scrupulous analysis of data being opened by public agencies and their value [9]. Therefore, new insights might be gained through an OGD barrier study conducted after the COVID-19 pandemic.

One theory that may particularly be valuable to studying barriers to OGD provision is Innovation Resistance Theory (IRT). This theory, developed by Ram & Sheth [23], claims that resistance to innovation depends on three sets of factors that lead to adoption, rejection, or modification of innovation if it is amendable to changes. It considers both functional and psychological (sometimes called behavioural) barriers. **Functional barriers** refer to “*product usage patterns, product value, and risks associated with product usage*” [23, p.7] and usually arise if consumers face significant changes from adopting the innovation, where we assume that data publishers can be considered as customers to some extent. **Psychological barriers** arise due to (1) the traditions and norms of the customer and (2) the perceived product image as a result of conflict with the previous beliefs of customers. The division into functional and psychological barriers allows IRT to explore both active resistance by means of functional barriers proposed by IRT, while psychological barriers refer to the analysis of passive resistance. Previous OGD barrier research reveals the importance of factors in both categories [15]. This study aims to develop an OGD-adapted IRT model to empirically identify predictors affecting public agencies’ resistance to openly sharing government data. Based on a literature overview of both IRT research and barriers associated with data opening by public agencies, we develop an initial version of the model, which we plan to refine in future research.

Throughout the entire paper, we use the terms OGD, openly sharing government data, government data openness, and government data sharing interchangeably.

## 2 BACKGROUND AND RELATED WORK

In this section, we provide a background on IRT and barriers to openly sharing government data. This should constitute the input to our OGD-adapted IRT model, which will use the IRT as a theoretical framework.

### 2.1 Innovation Resistance Theory

Resistance to change was defined by Zaltman and Wallendorf [24] as “*any conduct that serves to maintain status quo in the face of pressure to alter the status quo*”. According to Ram [25], it is associated with the degree to which individuals feel threatened because of the need to make changes to the typical process of doing something. Innovation Resistance Theory was initially proposed by Ram [25]

and then modified in 1989 [23] as a special version of ‘*resistance to change*’ widely discussed in (social) psychology in behavioural science concluding that resistance is a normal response of consumers when faced with innovation. More precisely, consumers experience resistance to changes imposed by innovation to the extent that they may suffer from changes that affect the typical process of obtaining information, purchase, use or dispose of new products. The main claim of IRT is that resistance to innovation depends on three sets of factors that lead to one of three – adoption, rejection, or modification of innovation, if it is amendable to changes. These factors are (1) **perceived innovation resistance**, which may be (a) **consumer dependent** and (b) **consumer independent** (e.g. trialability, divisibility, communicability, reversibility), (2) **consumer characteristics** – (a) **psychological variables** and (b) **demographics variables**, (3) **propagation mechanism** divided into (a) **type**, e.g., marketer controlled vs. non-marketer controlled, personal vs. impersonal, and (b) **characteristics** described by clarity, credibility, source similarity and informativeness. The decision on the adoption is achieved by considering both functional and psychological barriers, where Ram and Sheth [23] categorize functional barriers into product (1) **usage** patterns, (2) **value**, and (3) **risks** associated with its usage. These barriers are typically caused by significant changes that consumers face when adopting an innovation. Psychological barriers, however, arise due to (1) **traditions** and norms of the customer and (2) the perceived product **image** because of conflict with the previous beliefs of customers (Table 1). In the light of the above, and given the specificity of the OGD nature, we assume that not only end-users, but also data publishers can be considered as customers to some extent.

To identify relevant literature in which IRT was the primary research object, we conducted a systematic literature review (SLR) by searching Scopus and Web of Science (WoS). We queried these databases using the keywords (“*Innovation Resistance Theory*” OR (“*IRT*” AND “*innovation*” AND “*resistance*”)) in the search item’s title, keywords, and abstract. We only considered English peer-reviewed papers and book chapters. This search resulted in 52 articles in Scopus and 34 in WoS. After comparing the results and eliminating duplicates, 54 studies remained for their further examination.

The search results reveal that a vast majority of scholars used the IRT as the basis for the empirical evaluation of consumer resistance to innovations [30]. Huang et al. [31] found that digital financial services such as mobile payments, mobile banking, and e-commerce, including mobile social commerce, mobile website shopping, online shopping, are the two main research contexts for

**Table 1: The Innovation Resistance Theory (IRT) model and its elements.**

Resistance factors	Resistance sub-factors	Definition and source
Functional Barriers	Usage Barrier	The degree to which an innovation is perceived as requiring changes in consumers’ routines [23, 26]
	Value Barrier	The degree to which an innovations’ value-to-price ratio is perceived in relation to other product substitutes [26, 27]
	Risk Barrier	The degree of uncertainty in regard to financial, functional, and social consequences of using an innovation [26, 28]
Psychological Barriers	Tradition Barrier	The degree to which an innovation forces consumer to accept cultural changes [26, 29]
	Image Barrier	The degree to which an innovation is perceived as having an unfavorable image [23, 26]

IRT-applications. Our search results confirm this finding [32–35]. Huang et al. [31] found that there is a growing focus on food innovations such as organic food [36], the internet of things [37], and the collaborative consumption or sharing economy [26]. Huang et al. [31] and Talwar et al. [30] emphasize the need for the exploration of innovation resistance in emerging trends, which can be associated with some degree of risk or uncertainty, especially with regard to cutting-edge innovations such as Artificial Intelligence, smart services, genetic engineering techniques, 5G, virtual and augmented reality, blockchain, cryptocurrencies, and innovations that are associated with social and environmental benefits. Although IRT is rather domain-agnostic, it allows and even requires adaptations to the concerned topic and its specificities not only in terms of defining measurement items constituting the model but also their list and nature and, in some cases, even in relation to barriers. As an example, Leong et al. [35] investigated a consumer resistance to mobile wallet adoption extending the IRT model with “perceived novelty” and “mobile wallet resistance”, and socio-demographic variables such as education, age, and income. This allowed them to find significant effects of education, usage barrier, risk barrier, value barrier, tradition barrier, and perceived novelty on m-wallet innovation resistance, but not for age, income, and image barriers. Ma et al. [38] investigated the barriers to the use of MOOCs, where the “individual level barrier” including self-control and attitude with reference to “procrastination”, “distraction” and “concentration”, and “environmental level barrier” with reference to “promotion” and “circumstance” extended the IRT model. Several other scholars also adapted the IRT model to make it better fit the context of their research [34, 39–42]. In some cases, IRT is also used in combination with other theories

such as TAM [40], UTAUT framework [32, 44–46], and Distrust Theory [40]. Our literature review suggests that most studies using IRT adopt a quantitative approach, while the number of qualitative studies applying IRT is limited to a few exceptions (e.g., [38, 47, 48]).

## 2.2 Barriers to openly sharing government data

Previous studies already identified various types of barriers to openly sharing government data, which we assume can lead to resistance in OGD adoption. Table 2 presents these barriers in the IRT barrier categories.

## 3 OGD-ADAPTED INNOVATION RESISTANCE MODEL

IRT suggests to define five hypotheses, one for each barrier type, and to test and validate those using quantitative research (see Figure 1). Each hypothesis is developed as “[Construct ∈ {Usage barrier; Value Barrier; Risk barrier; Tradition Barrier; Image Barrier}] has a positive effect on public agencies’ resistance toward openly sharing government data”.

Table 3 provides the measurement items for each of the five hypotheses depicted in Figure 1. We defined the measurement items by drawing from existing IRT models and the corresponding measurement items found in the literature (Section 2.1), combined with the insights obtained on OGD-specific barriers (Section 2.2). In total 36 measurement items were defined.

We will refine and validate these measurement items in a round of interviews with public agencies. We expect that the validation interviews will also provide more insight in possible control variables

**Table 2: Examples of barriers to openly sharing government data that can lead to resistance.**

Resistance sub-factors	Examples of barriers to openly sharing government data, leading to resistance
Usage barriers	OGD often suffer from quality issues [9, 15, 21] Openly sharing government data is a complicated process [49] Open government data portals suffer from low ease of use [50] Insufficient user-friendliness of the data [51]
Value barriers	Open government data do not always provide value to users [52] Datasets may be incomplete [15, 53, 55] There may be concerns about the quality of open data [9, 15, 21, 51, 54, 56–58] Openly sharing government data requires resources, including time and costs [12, 55, 59] Impossible to sell the data when it is openly available [51, 60] Data providers are usually the ones who invest the most effort and time in publishing data, while businesses and citizens as data users profit the most [52]
Risk barriers	Organizations’ fear that openly shared government data will be misused [52] Organizations’ fear of open data users drawing false conclusions [49, 60] Organizations fear that (privacy) sensitive data will be shared openly [49, 51, 55, 57, 58, 61] Organizations fear making mistakes when preparing data for publication [53] Organizations fear being liable for data quality [49, 54, 55]
Tradition barriers	The risk-averse culture of governmental organizations avoids openly sharing the data [58, 62] Organizations are reluctant to change their processes [12, 60, 61] Incompatible routines and processes of organizations [12, 61] Civil servants may lack the skills required for openly sharing government data [12, 61, 63]
Image barriers	Organizations’ fear that their reputation will be damaged due to the publication of low-quality data [53] Organizations’ fear that they will be associated with incorrect conclusions drawn from OGD analysis [53]

**Table 3: The OGD-adapted Innovation Resistance Theory (IRT) model and its elements.**

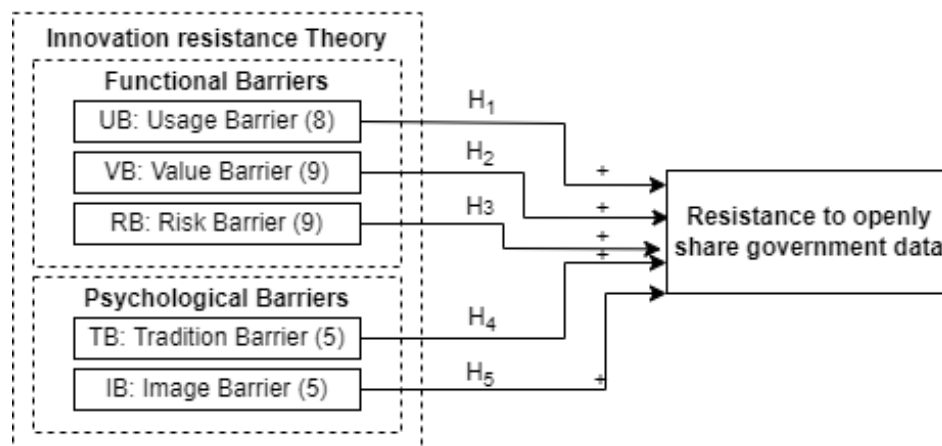
Barrier	Measurement item
Usage Barrier (UB)	UB1: It is difficult to attain the appropriate quality level for open government data to be shared openly UB2: It is difficult to prepare data for publication so that they comply with OGD principles UB3: It is difficult to prepare data for publication so that they become appropriate for reuse UB4: Data are difficult to publish on the OGD portal due to the complexity of the process UB5: Data are difficult to publish on the OGD portal due to the unclear process UB6: Data are difficult to publish on the OGD portal due to their limited functionality UB7: Open government data portals often do not allow for semi-automation of the publishing process UB8: It is difficult to maintain openly shared government data
Value Barrier (VB)	VB1: My organization believes that openly sharing government data is often not valuable for the public VB2: Many open government datasets are not appropriate for reuse VB3: Many open government datasets suffer from data quality issues (completeness, accuracy, uniqueness, consistency etc.) VB4: The public gains of openly sharing government data are often lower than the costs VB5: My organizations' gains of openly sharing government data are often lower than the costs VB6: Data preparation is too resource-consuming for my organization VB7: Open government data do not provide any value to my organization VB8: Open data that my organization can openly share will not provide value to users VB9: The amount of resources to be spent to prepare, publish and maintain open government data outweigh the benefit my organization gains from it
Risk Barrier (RB)	RB1: My organization fears the misuse of openly shared government data RB2: My organization fears the misinterpretation of openly shared government data RB3: My organization fears that openly shared government data will not be reused RB4: My organization fears violating data protection legislation when openly sharing government data RB5: My organization fears that sensitive data will be exposed as a result of opening its data RB6: My organization fears making mistakes when preparing data for publication RB7: My organization fears that users will find existing errors in the data RB8: My organization fears that openly sharing its data will reduce its gains (otherwise the organization could sell the data or use it in another beneficial way) RB9: My organization fears that openly sharing its data will allow its competitors to benefit from this data
Tradition Barrier (TB)	TB1: Freedom of information requests are sufficient for the public to obtain government data TB2: My organization is reluctant to implement the culture change required for openly sharing government data TB3: Employees in my organization lack the skills required for openly sharing government data TB4: Employees in my organization lack the skills required for maintaining openly shared government data TB5: My organization is reluctant to radically change the organizational processes that would enable openly sharing government data
Image Barrier (IB)	IB1: My organization has a negative image of open government data IB2: My organization believes that open government data is not valuable for users IB3: My organization fears that openly sharing government data will damage the reputation of my organization IB4: My organization fears that the accidental publication of low-quality data will damage the reputation of my organization IB5: My organization fears that associating them to incorrect conclusions drawn from OGD analysis by OGD users will damage the reputation of my organization

that need to be included, such as organization size, the existence of OGD legislation and policies, and the available funding.

#### 4 CONCLUSIONS AND FUTURE WORK

This study aims to develop an OGD-adapted IRT model to empirically identify predictors affecting public agencies' resistance to openly sharing government data. Based on the literature review concerning both IRT research and barriers associated with open data sharing by public agencies, we develop an initial version of the model. Compliant with the IRT literature, our conceptual model consists of five main constructs, including user barriers, value barriers, risk barriers, tradition barriers, and image barriers. Based on these barriers we defined five hypotheses to study the resistance of public authorities to openly share government data. For each of these constructs, we defined a list of measurement items specific

to the context of OGD. This study is conceptual, and we did not validate the created model yet. In our future research, we plan to refine the model by conducting exploratory interviews in countries with different maturity levels of OGD initiatives. Ultimately, we will validate the refined model in a quantitative study of public agencies' resistance to OGD provision. Considering the context of this model and the current rise in popularity of the Business-to-Government (B2G) data sharing, in light of which the European Commission is taking regulatory action and is preparing the Data Act to set the rules and conditions, thereby changing the current voluntary model to a more mandatory data sharing [65], we believe that the proposed model can become a reference model to analyse predictors affecting resistance to share data in this subdomain.



**Figure 1: Research model and proposed hypotheses (the numbers in brackets refer to the number of measurement items in Table 3)**

## ACKNOWLEDGMENTS

This research has been financed/supported by European Social Fund via "ICT programm" measure.

## REFERENCES

- [1] Thorhildur Jetzek, Michel Avital, and Niels Bjorn-Andersen. 2014. Data-driven innovation through open government data. *Journal of theoretical and applied electronic commerce research*, 9(2), 100-120.
- [2] Iryna, Åke Grönlund, and Marijn Janssen. 2015. Driving factors of service innovation using open government data: An exploratory study of entrepreneurs in two countries. *Information polity*, 20(1), 19-34.
- [3] Yang Zhenbin, Atreyi Kankanhalli, Sangwook Ha, and Giri K. Tayic. 2020. What drives public agencies to participate in open government data initiatives? an innovation resource perspective. *Information & Management*, 57(3), 103179.
- [4] European Commission. (2003). Directive 2003/98/EC of the European Parliament and of the council of 17 November 2003 on the re-use of public sector information. Retrieved March 16, 2015, from [http://ec.europa.eu/information\\_society/policy/psi/rules/eu/index\\_en.htm](http://ec.europa.eu/information_society/policy/psi/rules/eu/index_en.htm).
- [5] Open Knowledge Foundation. (2015). Open Definition version 2.0. Retrieved February 17, 2015, from <http://opendefinition.org/od/>.
- [6] Christian Philipp Geiger, and Jörn von Lucke, J. (2012). Open government and (linked) (open) (government) (data). *Journal of e-Democracy and Open Government*, 4(2), 265-278.
- [7] Victoria López, and Milena Čukić. 2021. A dynamical model of SARS-CoV-2 based on people flow networks. *Saf. Sci.* 2021, 134, 105034.
- [8] Fabio Dell'Acqua, and Daniele de Vecchi. 2017. Potentials of active and passive geospatial crowdsourcing in complementing sentinel data and supporting copernicus service portfolio. *Proc. IEEE* 2017, 105, 1913-1925.
- [9] Nikolaos Yiannakoulis, Catherine E. Slavik, Shelby L. Sturrock, and J. Connor Darlington. 2020. Open government data, uncertainty and coronavirus: An infodemiological case study. *Social Science & Medicine*, 265, 113549.
- [10] Oliver Benning, Jonathan Calles, Burak Kantarci, B., and Shahzad Khan. 2021. Transit Networks, Social Contacts, and Open Data Meet Public Transportation Plans for Post-COVID-19: A Canadian Case Study. *IEEE Engineering Management Review*, 49(3), 30-41.
- [11] Johan Linåker, and Per Runeson. 2021. How to enable collaboration in open government data ecosystems: A public platform provider's perspective. *JeDEM-eJournal of eDemocracy and Open Government*, 13(1), 1-30.
- [12] Maarja Toots, Keegan McBride, Tarmo Kalvet, and Robert Krimmer. 2017. Open data as enabler of public service co-creation: Exploring the drivers and barriers. In 2017 Conference for E-Democracy and Open Government (CeDEM) (pp. 102-112). IEEE.
- [13] Bernd W. Wirtz, Jan Weyerer, and Michael Rösch. 2019. Open government and citizen participation: an empirical analysis of citizen expectancy towards open government data. *International Review of Administrative Sciences*, 85(3), 566-586.
- [14] Stuti Saxena, and Marijn Janssen. 2017. Examining open government data (OGD) usage in India through UTAUT framework. *foresight*.
- [15] Martin Lněnička, Anastasiya Nikiforova, Stuti Saxena, and Purnima Singh. 2022. Investigation into the adoption of open government data among students: the behavioural intention-based comparative analysis of three countries. *Aslib Journal of Information Management*.
- [16] Md Shamim Talukder, Liang Shen, Md Farid Hossain Talukder, and Yukun Bao. 2019. Determinants of user acceptance and use of open government data (OGD): An empirical investigation in Bangladesh. *Technology in Society*, 56, 147-156.
- [17] Anthony Simonofski, Anneke Zuiderwijk, Antoine Clarinval, and Wafa Hammedi. 2022. Tailoring open government data portals for lay citizens: A gamification theory approach. *International Journal of Information Management*, 65, 102511.
- [18] Hui-Ju Wang, and Jin Lo. 2016. Adoption of open government data among government agencies. *Government Information Quarterly*, 33(1), 80-88.
- [19] Mohammad A. Hossain, Shams Rahman, Mohammed Quaddus, Elsie Hooi, and Abdus-Samad Olanrewaju. (2022). Factors Affecting Performance of Open Government Data Initiatives: A Multi-Method Approach Using Sem and FSQCA. *Journal of Organizational Computing and Electronic Commerce*, 1-20.
- [20] Muhammad M. Khurshid, Nor H. Zakaria, Muhammad I. Arfeen, Ammar Rashid, Saffi U. Nasir, and hafiz M.F. Shehzad. 2022. Factors influencing citizens' intention to use open government data—A Case study of pakistan. *Big Data and Cognitive Computing*, 6(1), 31.
- [21] Anastasiya Nikiforova. 2020. Timeliness of open data in open government data portals through pandemic-related data: a long data way from the publisher to the user. In 2020 Fourth International Conference on Multimedia Computing, Networking and Applications (MCNA) (pp. 131-138). IEEE.
- [22] Robert Viseur. 2021. Open data in digital strategies against COVID-19: the case of Belgium. In 17th International Symposium on Open Collaboration (pp. 1-10).
- [23] Sundaresan Ram, Jagdish N. Sheth. 1989. Consumer resistance to innovations: the marketing problem and its solutions. *Journal of consumer marketing*.
- [24] Gerald Zaltman, and Melanie Wallendorf. 1979. Consumer behavior, basic findings and management implications. Wiley.
- [25] Sundaresan Ram. 1987. A model of innovation resistance. *ACR North American Advances*.
- [26] Marius C. Claudy, Rosanna Garcia, and Aidan O'Driscoll. 2015. Consumer resistance to innovation—a behavioral reasoning perspective. *Journal of the Academy of Marketing Science*, 43(4), 528-544.
- [27] Mike Molesworth, and Jukka-Petteri Suortti. 2002. Buying cars online: the adoption of the Web for high-involvement, high-cost purchases. *JConsumBehav*, 2(2), 155-168.
- [28] Michal Posavac, Steven. S., Joško J. Brakus. 2007. Adoption of New and really New products: the effects of self-regulation systems and risk salience. *JMarkRes*, 44(2), 251-260.
- [29] Paul A. Herbig, Ralph L. Day. 1992. Customer acceptance: the key to successful introductions of innovations. *Mark Intell Plan*, 10(1), 4-15.
- [30] Shalini Talwar, Manish Talwar, Puneet Kaur, and Amandeep Dhir. 2020. Consumers' resistance to digital innovations: A systematic review and framework development. *Australasian Marketing Journal (AMJ)*, 28(4), 286-299.
- [31] Dan Huang, Alexandra Coghlan, and Xin Jin. 2021. Crossing the chasm: resistance to and adoption of Airbnb by Chinese consumers. *Journal of Travel & Tourism Marketing*, 38(6), 597-621.
- [32] Giacomo Migliore, Ralf Wagner, Felipe S. Cechella, and Francisco L. Liébana-Cabanillas. 2022. Antecedents to the Adoption of Mobile Payment in China and Italy: an Integration of UTAUT2 and Innovation Resistance Theory. *Information Systems Frontiers*, 1-24.

- [33] Jiunn-Woei Lian, and David C. Yen. 2014. Online shopping drivers and barriers for older adults: Age and gender differences. *Computers in human behavior*, 37, 133-143.
- [34] Puneet Kaur, Amandeep Dhir, Naveen Singh, Ganesh Sahu, Mohammad Almotairi. 2020. An innovation resistance theory perspective on mobile payment solutions. *Journal of Retailing and Consumer Services*, 55, 102059.
- [35] Lai-Ying Leong, Teck-Soon Hew, Keng-Boon Ooi, and June Wei. 2020. Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach. *International Journal of Information Management*, 51, 102047.
- [36] Shiksha Kushwah, Amandeep Dhir, and Mahim Sagar. 2019. Understanding consumer resistance to the consumption of organic food. A study of ethical consumption, purchasing, and choice behaviour. *Food Quality and Preference*, 77, 1-14.
- [37] Inès Chouk, I., and Zied Mani. 2019. Factors for and against resistance to smart services: role of consumer lifestyle and ecosystem related variables. *Journal of Services Marketing*.
- [38] Long Ma, and Chei Sian Lee. 2019. Understanding the barriers to the use of MOOCs in a developing country: An innovation resistance perspective. *Journal of Educational Computing Research*, 57(3), 571-590.
- [39] Mohd Sadiq, Mohd Adil, and Justin Paul. 2021. An innovation resistance theory perspective on purchase of eco-friendly cosmetics. *Journal of Retailing and Consumer Services*, 59, 102369.
- [40] Ashish Viswanath Prakash, and Saini Das. 2022. Explaining citizens' resistance to use digital contact tracing apps: A mixed-methods study. *International Journal of Information Management*, 63, 102468.
- [41] Savantan Khanra, Amandeep Dhir, Puneet Kaur, Rojers P. Joseph. 2021. Factors influencing the adoption postponement of mobile payment services in the hospitality sector during a pandemic. *Journal of Hospitality and Tourism Management*, 46, 26-39.
- [42] Peng-Ting Chen, and Shu-Chen Kuo. 2017. Innovation resistance and strategic implications of enterprise social media websites in Taiwan through knowledge sharing perspective. *Technological Forecasting and Social Change*, 118, 55-69.
- [43] Chih-Wei Lin, Su-Shiang Lee, Kai-Yu Tang, Yue-Xuan Kang, Chih-Chien Lin, and Yu-Sheng Lin. 2019. Exploring the users behavior intention on mobile payment by using TAM and IRT. In *Proceedings of the 2019 3rd International Conference on E-Society, E-Education and E-Technology* (pp. 11-15).
- [44] Edi Purwanto, Rachman Sjarief, and Chaerul Anwar. 2021. Driving and Restricting Factors of the Behavior Intention of the Digital Fishery Platform Adoption in New Normal: Combine UTAUT-IRT Model. *Review of International Geographical Education Online*, 11(8), 1089-1103.
- [45] Yoo Jung Oh, Hee Sun Park, and Young Min. 2019. Understanding location-based service application connectedness: Model development and cross-validation. *Computers in human behavior*, 94, 82-91.
- [46] Pick Yan Soh, Hui Bao Heng, Ganeshsree Selvachandran, Le Quynh Anh, Hoang Thi Minh Chau, Le Hoang Son, Mohamed Abdel-Baset, Gunasekaran Manogaran, and R. Varatharajan. 2020. Perception, acceptance and willingness of older adults in Malaysia towards online shopping: a study using the UTAUT and IRT models. *Journal of ambient intelligence and humanized computing*, 1-13.
- [47] Niklas Eriksson, Attes Gökhan, and Minna Stenius. 2021. A qualitative study of consumer resistance to mobile payments for in-store purchases. *Procedia Computer Science*, 181, 634-641.
- [48] Aditi Dang, Sayantan Khanra, and Muneza Kagzi. 2022. Barriers towards the continued usage of massive open online courses: A case study in India. *The International Journal of Management Education*, 20(1), 100562.
- [49] Emily Barry and Frank Bannister. 2014. Barriers to open data release: A view from the top. *Information Polity* 19: 129-152.
- [50] Anneke Zuiderwijk. 2015. Open data infrastructures: The design of an infrastructure to enhance the coordination of open data use.
- [51] Ruiqu Ma and Patrick Lam. 2019. Investigating the barriers faced by stakeholders in open data development: A study on Hong Kong as a "smart city". *Cities* 92: 36-46.
- [52] Bastiaan Van Loenen, Anneke Zuiderwijk, Glenn Vancanwenberghe, Francisco J. Lopez-Pellicer, Ingrid Mulder, Charalampos Alexopoulos, Rikke Magnussen, Mubashrah Saddiq, Melanie Dulong de Rosnay, Joep Crompvoets, Andrea Polini, Barbara Re, and Cesar Casiano Flores. 2021. Towards value-creating and sustainable open data ecosystems: A comparative case study and a research agenda. *JeDEM - eJournal of eDemocracy and Open Government*, 13(2), 1-27.
- [53] Anneke Zuiderwijk, Marijn Janssen, Ronald Meijer, Sunil Choenni, Yannis Charalabidis, and Keith Jeffery. 2012. Issues and guiding principles for opening government judicial research data. In *International Conference on Electronic Government* (pp. 90-101). Springer, Berlin, Heidelberg.
- [54] Antonio Vetro, Lorenzo Canova, Marco Torchiano, Camilio O. Minotas, Raimondo Iemma, Federico Morando, F. (2016). Open data quality measurement framework: Definition and application to Open Government Data. *Government Information Quarterly*, 33(2), 325-337.
- [55] Claudio Sonaglio Albano, and Nicolau Reinhard. 2014. Open Government Data: Facilitating and Motivating Factors for Coping with Potential Barriers in the Brazilian Context. In *Proceedings of the 13th IFIP WG 8.5 International Conference, EGOV 2014*. Dublin, Ireland, 181-193.
- [56] Martin Beno, Kathrin Figl, Jürgen Umbrich, Axel Polleres. 2017. Perception of Key Barriers in Using and Publishing Open Data. *JeDEM - eJournal of eDemocracy and Open Government* 9: 134-165.
- [57] Silja Eckartz, Wout Hofman and Anne Fleur Van Veenstra. 2014. A Decision Model for Data Sharing. In *Proceedings of the 13th IFIP WG 8.5 International Conference, EGOV 2014*. Dublin, Ireland, 253-264.
- [58] Chris Martin. 2014. Barriers to the open government data agenda: taking a multi-level perspective. *Policy & Internet* 6: 217-240.
- [59] Sharon Dawes, Lyudmila Vidasove, and Olga Parkhimovich. 2016. Planning and designing open government data programs: An ecosystem approach. *Government Information Quarterly*, 2016, 33.1: 15-27.
- [60] Peter Conradie and Sunil Choenni. 2014. On the barriers for local government releasing open data. *Government Information Quarterly* 31: S10-S17.
- [61] Jocelyn Cranefield, Olivier Robertson, and Gilian Oliver. 2014. Value in the mash: Exploring the benefits, barriers and enablers of open data apps.
- [62] Bernd Wirtz, Robert Piehler, Mark-Julian Thomas M-J, and Peter Daiser. 2016. Resistance of Public Personnel to Open Government: A cognitive theory view of implementation barriers towards open government data. *Public Management Review* 18: 1335-1364.
- [63] Sébastien Martin, Muriel Foulonneau, Slim Turki, and Madjid Ihadjadene. 2013. Open data: Barriers, risks and opportunities. In *Proceedings of the 13th European Conference on eGovernment: ECEG* (pp. 301-309).
- [64] Anne Fleur Van Veenstra and Tijs Van den Broek. 2013. Opening Moves – Drivers, Enablers and Barriers of Open Data in a Semi-public Organization. In *Proceedings of the 12th IFIP WG 8.5 International Conference, EGOV 2013*. Koblenz, Germany, 50-61.
- [65] Iryna Sussha, Jakob Schiele, and Koen Frenken. "Business-to-Government Data Sharing for Public Interests in the European Union: Results of a Public Consultation." *International Conference on Electronic Government*. Springer, Cham, 2022.