9. Open Government Data (OGD) usage in India: A conceptual framework using TOE & UTAUT frameworks

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Abstract:

Open Government Data (OGD) is considered as an important constituent of e-government where the notions of transparency, collaboration and participation are being envisaged. This paper is a step in this direction where the OGD platform (https://data.gov.in/) is being probed using a qualitative and quantitative lens. Research hypotheses are being derived following the popular TOE and UTAUT models and multiple regression informs the quantitative analysis to ascertain OGD usage by end-users. The study shows that OGD usage is popular among the end-users in terms of the number of views and downloads of the datasets. Future research might undertake the empirical investigation of the research hypotheses advanced in the paper.

Keywords:

Open Government Data, India, TOE, UTAUT

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1. Introduction

With the increasing impetus to the "open government data" (OGD) across several countries (Linders, 2013), there have been numerous challenges before the government vis-à-vis the implementation of OGD initiatives (Bates, 2014; Ohemeng & Ofosu-Adarkwa, 2015; Wang & Lo, 2016). However, despite increasing attention on OGD at different levels of government, there is little knowledge regarding the associated benefits, costs and barriers (Conradie & Choenni, 2014). OGD has been defined as the free availability of public sector information in open formats such that public access and exploitation thereof is enabled (Kalampokis, Tambouris, & Tarabanis, 2011; Ubaldi, 2013). OGD is also referred to as open Public Sector Information (PSI) which facilitates greater interaction, self-empowerment and social inclusion between the government and the citizens (Zuiderwijk & Janssen, 2014). OGD may be raw or processed; assume diverse forms; located in different parts of the government or related to public services or internal processes (Zeleti, Ojo & Curry, 2016). Eight principles characterize OGD: data should be complete, primary, timely, accessible, machine-processable, non-discriminatory, non-proprietary and license-free. OGD may be related to diverse sectors such as tourism, education, science and technology, agriculture or even war (Whitmore, 2014). The growing impetus on OGD is attested by the interest of both researchers and practitioners from various disciplines like information systems, management sciences, political and social sciences, and law (Charalabidis, Alexopoulos & Loukis, 2016). OGD are regarded as ""innovations that result from new government services that are offered via information technology (IT) platforms" (Wang & Lo, 2016: 80). For the present study, the technology-organization-environment (TOE) framework (Tornatzky & Fleischer, 1990) shall be employed for understanding the factors which impact OGD usage by citizens. Another model that would be deployed for the present study is that of Unified Theory of Acceptance and Use of Technology (UTAUT). For the present study, two factors from the former model (perceived benefits, perceived barriers) and three factors from the UTAUT model are being deployed.

The present study pertains to India where the government has launched its OGD initiative (https://data.gov.in/). Also, e-government initiatives have been spearheading over the years which churn out more OGD. Further, Indian public sector organizations have been in the forefront as far as "opening" their "data" and "information" are concerned. Since India is still in its early stages on both the parameters, the present study seeks to fill the gap by underscoring the prospects and challenges while pursuing the path of OGD. The paper follows a mixed methodology wherein multiple regression

shall inform the extent of "usage" of the OGD in terms of the number of "views" and the number of "downloads". Research hypotheses shall be advanced in the qualitative section wherein the adapted model covering TOE and UTAUT will be covered.

This paper shall follow the course of discussing about OGD and the models in Section 2 followed by the research model in Section 3, research methodology in Section 4 and discussion in Section 5.

2. Background

2.1 Open government data

"Open government" is an evolving field of research with its focus on three pillars: transparency, participation and collaboration (Wirtz & Birkmeyer, 2015). "Open government" has been defined in terms of the information technologies which generate a participatory, collaborative dialogue between policymakers and citizens (Evans & Campos, 2013) and the most apt evidence in this regard pertains to OGD. The assumption behind OGD is that "the state has claims on our personal information" (Keen et al., 2013: 229). Whether OGD should be addressed as "data" or "information" remains ambiguous owing to an unclear demarcation between the two terms (Borglund & Engvall, 2014). The governmental open data project may be defined as "an official web-portal launched at the federal or local level aimed at making certain types of governmental datasets publicly accessible via internet in a machine readable format" (Kassen, 2013: 508). OGD should be "transparent, reusable, standardized, and updated" (Sanoval-Almazan & Gil-Garcia, 2016). According to Lourenco (2015), OGD has seven components: quality; completeness; access and visibility; usability and comprehensibility; timeliness; value and usefulness and granularity. There are five main categories of OGD use activities; searching for and finding OGD (browsing, querying and exploring datasets); OGD analysis (statistical analysis; transforming data; viewing data online; downloading data); OGD visualization (generating plots, maps, graphs; interactive dataset representations); interaction about OGD (the use of feedback from end users as training input; collaboration through discussion forums, messaging, user groups and other functionalities); and OGD quality analysis (analysis and assessment of the dataset quality) (Zuiderwijk et al., 2016). Parallel to these categories are the barriers to OGD use: data fragmentation, terminology heterogeneity, search support, information overload; data context, data interpretation support, data heterogeneity, data analysis support; data visualization support; lack of interaction, interaction support and tools; dependence on the quality of open data, poor data quality, quality variation and changes.

Four perspectives (Bureaucratic, Technological, Political and Economic) on OGD have been derived (Gonzalez-Zapata & Heeks, 2015). The bureaucratic perspective envisages a policy of data regulations, strategies and processes within government and the benefits are improvements in public

services through greater efficiency and effectiveness of data management; the technological perspective emphasizes upon a technological innovation within government data systems where the main driver is improvement of government data infrastructure; the political perspective relates to a right of free access to public sector data and the benefits accrued to the citizens are in the form of better governance through increased transparency, accountability, participation and empowerment, and the economic perspective which lays down that OGD is a mechanism to generate data-based economic value by providing new products, services, revenue, profits and jobs. Countries across the globe have been initiating OPD programmes. Elements of OGD are (Ubaldi, 2013: 6): business information (including Chamber of Commerce information, official business); registers; patents; trademark information, and public tender databases; geographic information (including address information, aerial photos, buildings, cadastral information, geodetic networks, geology, hydrographical data, and topographic information); legal information (including decisions of national, foreign, and international courts and national legislation and treaties); meteorological information (including climate data and models and weather forecasts); social data (including various types of statistics on economics, employment, health, population, and public administration); and transport information (including information on traffic congestion, work on roads, public transport, and vehicle registration). Notwithstanding the above, there are quality concerns linked with OGD (Vetro et al., 2016). There are issues of accuracy, aggregation and precision in OGD (Allison, 2010).

The concept of OGD was inspired by the Obama administration in 2009 when the open government strategy of the US was launched to "ensure the public trust and establish a system of transparency, public participation, and collaboration" (The White House, 2012). Chile created an OGD portal in 2011 and joined the Open Government Partnership in 2012 (OGP, 2015). The Danish Basic Data Program (BDP) was initiated in 2012. South Korea enacted the "Open Data Law" in 2013 through which the national government and public organizations have made available their machine-readable data to firms and citizens free of charge for any appropriate purpose (Jung & Park, 2015). Among the developing nations, Ghana commenced its own Ghana Open Data Initiative (GODI) project.

There are four objectives behind OGD initiatives (World Bank, 2014): to promote economic growth including business innovation and the creation of firms and jobs; to ensure closer and more inclusive citizen engagement in improving on standards of provision and service performance; to increase transparency and accountability and to improve efficiency and operation of public services themselves through better decision-making processes based on fuller access to public data from other agencies. OGD may be explored by throwing light on three dimensions: policy-making; implementation and impact. In terms of policy-making, studies have underlined how OGD is being perceived in terms of independent policy being adopted by different countries (Zuiderwijk & Janssen,

2014; Jung & Park, 2015). Among the studies which focus on the challenges and opportunities while implementing OGD, issues such as predictors of OGD adoption (Zuiderwijk, Janssen, & Dwivedi, 2015), evaluation of OGD initiatives (Attard, Orlandi, Scerri, & Auer, 2015) and strategic frameworks (Jetzek et al., 2012) have been propounded. Finally, vis-à-vis the impact of OGD, studies are wanting in terms of what are the economic and social implications of OGD. For instance, one of the benchmarks for OGD is participation (Veljkovic et al., 2014). Despite the theoretical advantages underlying OGD, OGD is not being exploited for use to the extent anticipated (Whitmore, 2014).

Implicitly, this is a constituent of "participatory governance" wherein the publication of government data facilitates citizens' participation in governance processes like decision-making and policy-making (Attard et al., 2015). Participatory governance has been defined in terms of a democratic engagement of individuals and groups in the policy-making process (Yishai, 2012). Also, participatory governance may be defined in terms of the engagement of those who are affected by a problem in the process of solving it (Lee, 2013). Participatory governance impacts the development of communication skills, citizen empowerment and community capacity-building (Fischer, 2012). The downside of participatory governance has been listed as the capture of public power by private interests, the evasion of accountability, and the deepening subordination of already marginalized communities (Lee, 2013), lack of political support and information and inadequate resources among local stakeholders (Fischer, 2012). The proponents of OGD avow that the aforementioned issues may be tackled by open data initiatives through discussion, dialogue and participation in decision-making (Davies, 2010). Saxby (2011: 4) affirms that OGD is symbolic of a shift in government thinking because it invites broader public participation in delivery of policy. This has been substantiated in the affirmation that OGD strengthens democratic participation (Huijboom & Van den Broek, 2011). Furthermore, citizens are able to learn more about the government activities as well as gives them the opportunity to hold the government accountable for its actions and spending (Janssen, 2011).Also, OGD fosters trust-building between the government and the citizens (Dawes et al., 2016) and helps in keeping the citizens more informed thereby enabling them to make better decisions (Rojas et al., 2014). Research -linking participatory governance with OGD- is sparse (Bertot et al., 2014; Chan, 2013; Solar et al., 2012; Sheffer Correa et al., 2014; Yang & Kankanhalli, 2013). Likewise, studies covering stakeholder feedback have remained few and far between, however (dos Santos Brito et al., 2014; Jetzek et al., 2014; Parycek et al., 2014; Vasa & Tamilselvam, 2014). Since there is a lack of consumers exploiting existing open data portals, there is a need for understanding what factors influence participation in open data (Attard et al., 2015). Therefore, it is important that consumers (including citizens, end users and benefeciaries) must be made aware of the published data, as also of its relevance and usefulness (Mutuku & Colaco, 2012). OGD provides a platform for citizens to give their feedback which would improve service delivery and facilitate citizen participation (Johnson & Robinson, 2014).

2.2 Models of OGD

This section deals with the models of OGD forwarded by Sieber and Johnson (2015) with Table 1 providing the key points:

Model	Features	Benefits	Costs
Data over the wall: Government publishing of open data	Acts as a unidirectional conduit from government to the end-user; Provides access via direct downloads of complete data sets provided in popular formats or through establishing programmatic access via a software interface.	Standardize organizational data and realize other efficiencies; reduce requests for data; promote economic development; increase transparency and trust; limit role of government to open data provision.	Technical maintenance; licensing, confidentiality; release of easiest data only; vulnerable to neoliberalism; difficulty in development of metrics and no guarantees for realizing value.
Code exchange: Government as open data activist	Government produces open data as an end (i.e., to deliver data) and also directs the use of data for the benefit of citizens, the private sector, or government itself; Government encourages the deveopment of saleable or internally useful products based on its provision of open data; Model may be accompanied by promotional or other	Actively engage in local economic development; reduce costs of app development; reduce/shift service delivery; benefit from customized innovation.	Possible misappropriation; privatization; increased difficulty for analytics; data flows aligned with private interests; participation re-envisioned as consumption and limited to entrepreneurs; duplication of services where citizen reports do

	forms of supportive activity and is often framed in the context of an application "app" contest.		not flow to government.
Civic issue tracker: Data from citizen to government	Government opens itself to citizen contributions of data, and the acknowledgement by government of this contribution; Citizens report problems (e.g., potholes and noise complaints) and crises (e.g., floods or fires), in the style of 'municipal 311' issue reporting or service monitoring.	Obtain more immediate data and citizen feedback from citizen sensors; ease citizen reporting; promote social networking.	Reliance upon data of suspect accuracy and provenance; loss of expert staff; increased requests for services; increase digital inequity; disrupt organizational routines.
Participatory open data: Open data as open government	Government enters into a participatory two-way exchange with citizens; Open data is reciprocal, both data provision from authoritative sources and a request for new, citizen generated data that can support service delivery and open a new channel for discussions about policy; Open Data is seen as a formalized conduit between citizen and government where citizen contributions are integrated into decision-making, with government	Explicitly promote transparency, rights and democratic objectives; increase trust with civil society; provide check on government; promote social connectedness.	Exposure of government errors or malfeasance; declining public trust; participation reduced to image management, public venting or public consultation.

	required to fill demand-side requests for not only existing data, but for structuring the why, when and how of future data collection.		

Table 1: Models of OGD

2.3 Open government data adoption: an innovation perspective

OGD may be clubbed under the heading "innovations" because any idea, practice or object which is viewed as new by an individual or other unit of adoption is called an "innovation" (Rogers, 1995) and OGD is a government service which is delivered via new technology applications. Extant literature invokes five models for studying individuals' intentions to adopt innovative IT systems: Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1989), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh,Morris, Davis, & Davis, 2003), and Diffusion of Innovation (DOI) (Rogers, 1995). Following a cognitive theory, OGD implementation barriers have been demarcated as perceived legal barriers, perceived bureaucratic decision barriers, perceived organizational transparency, perceived hierarchical barriers and perceived risk-related attitude of administrative empoyees (Wirtz et al., 2015). For the present study, the TOE framework proposed by Tornatzky and Fleischer (1990) is being invoked which comprises of three elements: technological context; organizational context and external environment context. The technological context is linked with the technologies that are available to the organization where the focus is on how technological characteristics influence adoption processes; the organizational context pertains to the characteristics of an organization where the focus is on structures and processes of an organization which obstruct or facilitate innovation adoption and implementation; the external environment is related to the sphere in which an organization conducts business. "Perceived benefits" refers to the anticipated benefits that OGD can offer to government agencies (Chwelos et al., 2001). "Perceived barriers" implies the obstacles in adopting OGD. "Organizational readiness" implies the extent to which top management supports government agencies to adopt OGD and the extent to which there are robust IT infrastructures to support OGD initiatives by government agencies (Yang et al., 2015). "External pressures" refer to the formal external forces which are exerted upon the government agencies by other organizations as well as the demands from the public in line with their expectations (DiMaggio & Powell, 1983). The TOE framework has been extensively used for appreciating the adoption of technological innovations like electronic data interchange (EDI) (Kuan &

Chau, 2001), information and communication technologies (ICT) (Srivastava & Teao, 2010), open systems (Chau & Tam, 1997), etc.

2.4 Open government data usage: a technology perspective

The present study adopts the UTAUT framework in line with the work by Zuiderwijk and his colleagues (Zuiderwijk et al, 2015). UTAUT was proposed based upon the literature on acceptance of technology and the predictors of this acceptance (Venkatesh et al., 2003). The underlying dimension of UTAUT is that a number of factors lead to the behavioral intention to accept and use a system or technology, while its behavioral intention in combination with facilitating conditions leads to the actual use of this system or technology (Sykes, Venkatesh & Gosain, 2009). UTAUT is being regarded as an appropriate theory for examining the acceptance and use of open data technologies because it takes into account the factors which influence Information Technology (IT) surrounding open data apart from social factors. Our main concern for the present shall be on the social factors or the behavior of open data users which influence the interaction between the open data available and the users. The significance of investigating social factors in research on technology adoption has been researched earlier too (e.g. Gwebu & Wang, 2011). Further, UTAUT has been used to probe the factors which influence the intention to use open government (Jurisch, Kautz, Wolf & Krcmar, 2015). The UTAUT model has four constructs which directly predict the behavioral intention to use Information Technologies (IT), namely Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions besides four moderators on Gender, Age, Experience and Voluntariness of Use. Behavioral intention implies an individual's intention, prediction or plan to use a technology in the future. Performance expectancy is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003: 447). In terms of the usage of open data, it may be deduced that people are more likely to use traditional ways of working if they believe that open data technologies and applications are not going to help them with performing better or making more money. It is posited that with the availability of open data technologies, such as open data platforms, software, tools and interfaces, an individual's expectancy to perform better would increase. Effort expectancy is linked with the degree of ease associated with the use of a technology (Venkatesh et al., 2003) and the extent to which a person believes that using an open data technology will be free of effort (Gwebu & Wang, 2011). Factors such as location of OGD (Ding, Peristeras & Hausenblas, 2012); formats of OGD (Jeffery, Asserson, Houssos, Brasse & Jorg, 2014; Verma & Gupta, 2012); semantics and diversity of OGD; quality levels of OGD (Petychakis, Vasileiou, Georgis, Mouzakitis & Psarras, 2014); accessibility or availability of OGD (Conradie & Choenni, 2014) impact an individual's propensity to use OGD. Skills to use internet are not uniform among citizens (Parycek & Sachs, 2010). Citizens' capabilities to interpret open data may vary (Raman, 2012). Specialist knowledge is lacking to interpret the open data (Martin, 2014).

Furthermore, people have different capacities to access and use open data (Davies & Bawa, 2012). Social influence implies the extent to which an individual perceives that significant others believe that he/she should use the new system (Venkatesh et al., 2003 451). In the present study's context, it might be possible that the influence of colleagues, supervisors and others could propel an individual to use the OGD. Facilitating conditions are the organizational and technological infrastructures which exist to support use of the system by an individual (Venkatesh et al., 2003: 453). Facilitating conditions could be in the form of networks, connection to internet or the availability of sufficient and appropriate open data infrastructures which might influence an individual's intention to use OGD. Further, since access to internet may vary across citizns, an individual's usage of OGD might vary (Parycek & Sachs, 2010). Finally, voluntariness of use implies the extent to which individuals believe that the use and acceptance of open data technologies are perceived as voluntary or of free will. Individuals perceive that they can create value with open data (Jetzek, Avital & Bjorn-Andersen, 2014). It is posited that when an individual is not obligated to use open data technology, he or she is less likely to actually use open data technology.

3. Research model

Two models (TOE & UTAUT) inform the present research. Following the TOE and UTAUT frameworks, the research model for the present study is being depicted in Figure 1. The technological context has been delineated into perceived benefits and perceived barriers. Perceived benefits refer to the anticipated advantages of an innovation for an organization (Chwelos, Izak, & Dexter, 2001). In the case of OGD, such benefits may be in the form of increased transparency, economic growth, public relations improvements, more favorable views of governments, improved government data and processes, increased data value, minimized errors when working with government data, etc. (Kucera & Chlapek, 2014). Perceived barriers may be underscored through dimensions such as institutional barriers, task complexity of handling data, uses of open data and participation in the open data process, legislation, information quality, technical barriers (Janssen et al., 2012). Likewise, from the user's perspective, barriers are linked with the availability and access, fundability, usability, ease of comprehension, quality, data linking and combining capacity, comparability and compatibility, metadata quality, interactions with data providers and opening and uploading experiences (Zuiderwijk et al., 2012). From the UTAUT framework, we are invoking “Social influence”, “Voluntariness of use” and “Facilitating conditions”. Following research propositions emerge from the research model:

H1: Perceived benefits are positively linked with OGD usage.

H2: Perceived barriers are negatively linked with OGD usage.

H3: Social influence is positively linked with OGD usage.

H4: Voluntariness to use is negatively linked with OGD usage.

H5: Facilitating conditions are positively linked with OGD usage.

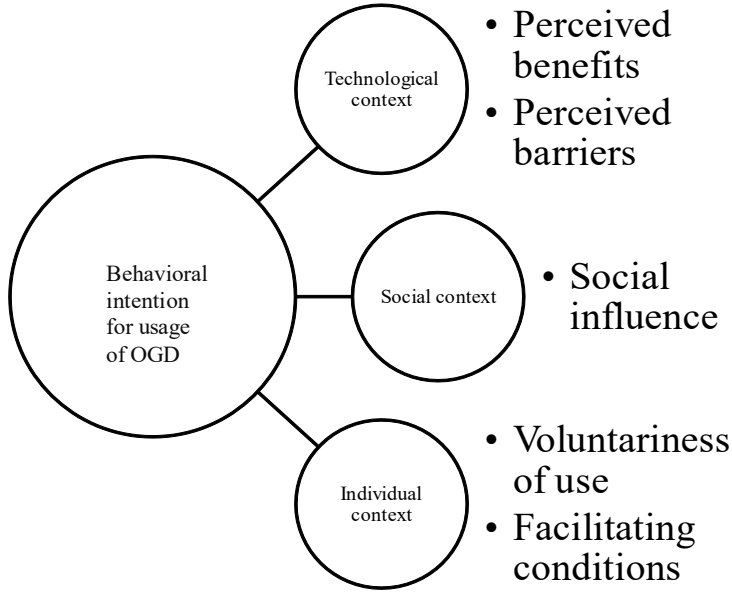

Figure 1: Proposed model for evaluating the behavioral intention for usage of OGD

4. Research methodology

4.1 Sample

Open Government Initiative (Open Government Data (OGD) Platform (https://data.gov.in/)) was launched in October 2012 with the aim of proactive dissemination of data by Government Ministries, Departments and other organizations. OGD has been defined as "A dataset is said to be open if anyone is free to use, reuse, and redistribute it – Open Data shall be machine readable and it should also be easily accessible" and data has been defined as "a representation of information, numerical compilations and observations, documents, facts, maps, images, charts, tables and figures, concepts in digital and/or analog form" and dataset has been defined as "a named collection of logically related

features including processed data or information" (National Data Sharing and Accessibility Policy (NDSAP) Implementation Guidelines, 2014[1]). The initiative provides a platform for publishing datasets/applications by authorized users from Ministries/Departments/organizations. A snapshot of the OGD Platform is provided in Table 2. The Platform allows an individual to suggest a data set. Implicitly, as per the models given by Sieber and Johnson (2015) , India's OGD Platform falls in the "Participatory open data" model.

Resources	23855	Catalogs	3817
Departments	101	Times viewed	6.37 million
Times downloaded	2.55 million	Chief Data Officers	111
APIs	327	Visualizations	765

Table 2: Key indicators of OGD Platform

For the present purpose, a multiple regression is being attempted where 341 out of a total of 3814 catalogs (https://data.gov.in/catalogs) are being surveyed in terms of the number of "views" and the number of datasets as the independent variables and the number of "downloads" as the dependent variable.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.790[a]	.625	.622	719.903

a. Predictors: (Constant), Number of Views, Number of Datasets

With multiple correlation coefficient as 0.79, the model is well-predicted. The coefficient of determination (R-Squared) is 62.5% which implies the proportion of variance explained by the independent variables.

[1] National Data Sharing and Accessibility Policy (NDSAP) Implementation Guidelines, Available at https://data.gov.in, accessed on 29th April, 2016)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	292363984.442	2	146181992.221	282.063	.000[b]
	Residual	175690406.953	339	518260.787		
	Total	468054391.395	341			

The F-ratio is indicative of the overall regression model which shows that the model is a good fit for the data. The results show that the independent variables statistically predict the dependent variable, $F(2,339)=282.063$, $p<0.0005$. Both the independent variables predict the dependent variable quite well. For every increase in the number of datasets, the number of downloads increases by 36.9%. Likewise, for every increase in the number of views, the number of downloads increases by 97.1%. Both the variables are statistically significant which increases the predictive power of the model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.369	46.429		.008	.994
	Number of Datasets	4.665	.793	.199	5.880	.000
	Number of Views	.971	.045	.730	21.559	.000
Dependent Variable: Number of Downloads						

5. Discussion

There is quality issues linked with the OGD usage. For instance, there is a lack of metadata which can hinder the retrieval of relevant information in public sector information systems (Christian, 2001; Quam, 2001; Whitmore, 2012). Users complain about the useless or inconsistent formats of OGD

(Kerschbeerg, 2011). Information is incomplete or only a part of the information is provided covering a certain time range (Janssen et al., 2012). Second, there is over classification of information which makes it difficult to obtain records (Feinberg, 2004; Strickland, 2005). Third, data are not always current and there is a lack of opportunity for public participation in the delivery of the open data (Lee & Kwak, 2012). Fourth, users lack the requisite domain knowledge to tap OGD to their advantage (King, Liakata, Lu, Oliver & Soldatova, 2011). Fifth, there is a lack of interoperability between datasets (Mclaren & Waters, 2011). Sixth, there is a shortage of the statistical knowledge which is required to successfully work with the datasets (Janssen et al., 2012). Nonetheless, mere publicizing of data or thinking that open data will result in open government is fallacious (Janssen, Charalabidis & Zuiderwijk, 2012). It has been observed that OGD efforts have remained data- and supply-driven, unidirectional (lacking feedback mechanisms) and utilitarian (suffering from technological determinism) which hampers citizen engagement (Evans & Campos, 2013). Further, the "digital divide" (Gurstein, 2011), in terms of the inequalities between those with the resources to use open data and those without the same, creates difficulty in citizen engagement. Finally, there are concerns between providing comprehensive data sets and meeting the requirements of users with different levels of knowledge background and skills (Susha, Gronlund & Janssen, 2015). Further, the socio-technical impediments may be in various forms (availability and access, findability, usability, understandability, quality, linking and combining data, comparability and compatability, metadata, interaction with the data provider, opening and uploading) from the users' perspectives (Zuiderwijk et al., 2012). For making the open data more user-friendly, a number of steps may be taken: e.g. providing background information on the data sets; paying attention to the design and presentation of data, including data set hierarchy, prioritization and navigation; and creating communication links between data holder and potential users via freedom of information request form (Davies, 2012). In a comparative study on open data policies from UK, USA, Netherlands, Kenya, Indonesia; five lessons for open data policies were drawn: the need for a robust legal framework to regulate the process of publishing government data and addresses the concerns of the government entities when publishing government data online; defining generic operational policies which regulate the everyday operations of publishing data and also ensuring the reusability of the data for data users by addressing the formats and standards of the data sets; facilitating the interaction between data providers and data users to stimulate the supply and demand chain of published data sets and to ensure the quality of the data that is published which creates mechanisms to update the data regularly; the creation of a designated agency of taskforce in-charge for the nation's open data processes; and creation of initiatives and incentives stimulating the demand for data (Nugroho et al., 2015). It is posited that these lessons are applicable for Indian context as well where OGD is in its growth phase.

This paper sought to undertake a study of OGD-one of the significant stages of e-government. Mixed methodology was adopted in the study where a conceptual framework was derived using TOE and UTAUT models. Research propositions were advanced, thereafter. Thereafter, a quantitative analysis was done where multiple regression was done using 341 catalogs were picked out of 3814 catalogs available on the OGD platform (https://data.gov.in/). It was deduced that the number of downloads of datasets was contingent upon the available datasets and the number of views which is indicative of the popularity of the OGD among end-users. Future research may be conducted to test the research propositions advanced in this paper. Further, a comparative perspective may be drawn regarding the Indian versus other developing countries in terms of OGD.

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