Nature and Scope of Open Government Data (OGD) in Oman

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Abstract. With the transition of governments to e-governments, the latest measure of ensuring transparency and accountability is through providing more and more access to government data which was hitherto reserved in "silos". This is the process entailed in "Open Governments" and the data thus opened freely is called "Open Government Data" (OGD). The transition of traditional governments to e-governments has been amply covered in extant literature. However, Open Government is regarded as the final culmination of e-government in a bid to restore public accountability and promote transparency in government besides forging government-citizen ties. In this paper, the nature and scope of OGD of Oman is being investigated. Also, the facilitating and hindering factors in tapping OGD are being discussed in the paper. The paper concludes with directions for further research and academic-cum-practitioner implications. The originality of the paper lies in the fact that the nature and scope of OGD has not been investigated in detail as far as Oman is concerned-the present study seeks to plug this gap.
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JEL. H10, H50, H55.

1. Introduction

Governments around the globe have been tapping information technology for providing services to the people. Therefore, internet has been amply used for providing services to the citizens which would help in improving ties with the citizens (Sivarajah *et al.,* 2016). Furthermore, it is anticipated that there would be greater engagement, participation and cooperation between the government and the citizens' post-adoption of e-government initiatives. The culminating stage of e-government is that of "Open Government" wherein a number of national and local governments have implemented "Open Government Data" (OGD) policies (Martin, 2014). OGD offers many possibilities for ensuring public accountability and transparency. However, there are challenges associated with the same as well (Conradie, & Choenni, 2014). For instance, there are privacy concerns veering around the process of opening up data sets. Likewise, there are infrastructural issues which impede the process of opening the data sets. For instance, it is understandable that developing countries face more challenges than the developed countries as far as initiating OGD initiative in a robust manner. The most essential part of the OGD is its re-use by different stakeholders (Janssen, Charalabidis & Zuiderwijk, 2012; Safarov, Grimmelikhuijsen & Meijer, 2017). Furthermore, usage may be promoted only when the data sets are of good quality and there are user-friendly interfaces of tapping these data sets (Torchiano, Vetro & Iuliano, 2017). In the present study, we will investigate the nature and scope of

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OGD in Oman. Hitherto, Oman's PGD has been investigated in a marginal manner (Saxena, 2016; Saxena, 2017). The originality of the present study lies in its detailed investigation of the open data sets. Furthermore, we will underline the barriers in tapping the data sets by investigating select data sets. The paper shall sketch the background of Oman and explore the data sets of Oman. Finally, the paper shall conclude with future research directions, limitations and implications for practitioners and academicians.

2. Related research

In this section, we will underline the rationale for conducting the present study. As such, OGD is an emerging phenomenon and a number of scholars have evinced interest in this area very recently. A number of studies have been conducted to assess the broad features of OGD. For instance, Attard and her colleagues investigate the OGD initiatives in the context of the United States of America and underline the major defining features of OGD (Attard *et al.,* 2015). Single case-studies have also been conducted on OGD and different themes have been identified in a similar manner. For instance, Bates has underscored the significance of OGD for the United Kingdom (Bates, 2014). Gerunov (2016) has taken up the OGD policy of Bulgaria and underlined the features of the country's policy. OGD nature and scope has been investigated in the context of Ghana (Ohemeng & Ofosu-Adarkwa, 2015). In the context of Spain, OGD of Municipal body has been explored and the possibilities have been underlined therein (Carrasco & Sobrepere, 2015). Kassen (2013) has probed the OGD initiative in Chicago. Finally, Jung & Park (2015) have investigated the OGD initiative in South Korea using a semantic (TRIZ) network analysis. Furthermore, the barriers in OGD use and the overall nature and scope of OGD initiative in China has been investigated elsewhere (Piotrowski *et al.,* 2009). Studies in the Middle East context have been few and far between. However, Oman's OGD has been examined in a cursory manner in few studies (Saxena, 2017). The present study seeks to further explore the OGD initiative in Oman and therein lies the originality of this study.

3. Oman: A brief background

Oman is a country located in the Arabian Peninsula. As a Sultanate-meaning kingdom-Oman shares borders with Saudi Arabia, the United Arab Emirates (UAE) and the Republic of Yemen. Oman has the total area of 309,500 sqkm. Primarily, the country rests its economic growth on the success of the oil and gas sectors. However, of late, the recent plummeting of the oil prices has adversely impacted the country's economy. Therefore, the country is diversifying into non-hydrocarbon sectors. Some of the key indicators of the country are provided in Table 1.

Table 1. *Key statistical indicators of Oman*

	GDP (USD million)	Population (million)	Gross enrolment ratio, primary education (both sexes) (%)	Gross enrolment ratio, secondary education (both sexes) (%)	Mobile cellular subscriptions (per 100 people)	Internet users (per 100 people)	Merchandise trade (% of GDP)
2015	70,255	4.49	110.3	100	157.8	70.2	70

Source: [Retrieved from].

4. Open Government Data (OGD) in Oman: Nature and scope

OGD of Oman [Retrieved from] is designed such that the country expresses its commitment to "Open Data Initiative" in line with the Royal Decree 40/2014. Oman's Open Data policy envisages making "explicit the Sultanate of Oman Government's commitment to open data", helping "agencies in understanding community and industry priorities for open data", simplifying and facilitating the

"release of data by Goverment agencies in Sultanate of Oman", creating a "practical policy framework that enables high-value datasets to be released to the public", defining "principles of open data to promote information based culture", increasing "opportunities for this raw data being used creatively to build innovative applications with a positive economic and social benefit to the public". The principles on which the open data are being administered are that: data sets should be complete in all respects; data sets should be primary and there should be as much granularity as possible; data sets should be timely and real-time information should be provided; data sets should be available permanently; data sets should be easily accessible; data sets should be machine processable in machine-friendly formats (CSV, XLS, JSON, XML, etc.); data sets should be digitally attested to ensure their authenticity and integrity; data sets should be documented; data sets should be non-discriminatory and they should be made available to anyone without any need for identification or registration; data sets should be non-proprietary such that data can be accessed without any requirement for a software license; and finally, data sets should be made available in a free manner and there should be no restraint in terms of any copyright, patent, trademark or trade secret regulation.

As per the official policy (Royal Decree 118/2011 and Royal Decree 42/2015), two kinds of data are not meant for being openly shared: personal data (data which has information about specific individual) and government data which is classified as sensitive (for national security purposes). The target users of the data sets are citizens, investors, researchers and developers. As of now, there are 17 data providers, 56 data sets and 3 mobile apps. The 3 mobile apps relate to NCSI Geo (which provides socio-economic statistical information about the Sultanate of Oman with interactive maps), Waqudi (which provides the end users with the requisite tools to search, locate and navigate petrol stations) and Banki (which provides the facility of searching and locating bank branches). Data sets pertain to sectors like Education, Health, Budget, Energy, Social Development, Employment, Labor, Procurement, Local Planning, Transportation, Journalism, Higher Education, Housing, Security, Public Safety, Consumer Price, Corruption, Vulnerable groups, Investment opportunities, e-Services Usage Survey and Job seekers. These data sets pertain to 12 sectors. There is a Chief Data Officer from the National Center for Statistics and Information (NCSI) which is the main regulatory body of the official statistics which is disseminated at the national, regional and local levels. The functions of the Chief Data Officer have been laid down in the Royal Decree 40/2014 and the same have been listed in Table 2.

Table 2. *Functions of the Chief Data Officer (CDO)*

Functions of the Chief Data Officer
1. Providing supervision over the management and organization of statistical and informational work in the Sultanate.
2. The proposal and implementation of statistical and informational strategy.
3. The coordination with the state agencies in this area.
4. The collection of data used to be utilized whenever the need arises.
5. Ensuring there is harmony between the statistical and informational work and the national development objectives.
6. The conduction of national censuses.
7. The creation and publishing social, economic, environmental and cultural indicators.
8. The publishing and making the information and the official national statistics available on both the national and international levels.
9. The establishment and management of an integrated system of social and economic information on the national level to meet the various development requirements.
10. The establishment of indicators in order to measure the development performance in the Sultanate.

5. Barriers in tapping OGD in Oman's context

First off, the number of open data sets is quite less. Therefore, it is important that more departments should be encouraged to share the data which might have been stored in silos. Second, real-time data sets are not there at all. Inclusion of real-time data sets is a major step in any OGD initiative and governments require

the R&D infrastructure coupled with a sophisticated IT platform to ensure the sustainability of the OGD initiative. Oman is yet to come up with a robust IT infrastructure to support the provision of OGD on a real-time basis. There are some problems in the data sets which are being offered at present. This is the third challenge for the users to tap the data sets. For instance, if we look up for data sets pertaining to "Energy", we are being directed to the main portal [Retrieved from]. Likewise, if we probe the data sets of Higher Education, we are being provided with a zip file containing two excel sheets and none of these have the information about the period for which the data has been recorded. There are missing values in these data sets and this incomplete nature of data sets poses a serious challenge to tap these data sets. In one of these excel sheets, it is unclear as to how should one interpret the term "active students". Moreover, other vital statistics about enrolment are missing (drop-out rates, number of girls and boys, branches and disciplines, etc.).

Another set of data sets pertain to "Investment opportunities" wherein there are nine files (eight are excel sheets and one is csv). If we look at the "Total number of registered enterprises by legal type", there is data for 2013 till 2017 and the data has been updated on 4th May, 2017. However, there is missing data in this data set. For instance, "House Trade Business" has data for only 2015; "Commercial Representative Office" does not provide data for 2017 and 2016. In the data set for the "Number of International Standard Industrial Classification of all economic activities register by business location", only Al-Buraimi governorate has been covered. Therefore, we have no data for this category for other governorates. Other data sets also suffer from serious drawbacks. In the "Education Portal" [Retrieved from], we have only "School count", "Students count" and "Teachers count". Evidently, this is incomplete and incomprehensive. It is important that more data sets are provided which have direct relevance for education. There are spelling errors and the OGD initiative has a long way to go. For instance, in the "Visualization of the day" [Retrieved from], the last time when a graphical representation was uploaded was on 11th April, 2017. Furthermore, these visuals are limited in their coverage of the time period. Whereas the visualization on "Financial expenses and income" covers the period between 2004 and 2015; the "Oil and gas revenues" category covers the period from 2009 till 2014 only. In the data set category of "Vulnerable Groups", there are 7 files pertaining to "The number of social security cases disaggregated by governorate type of disbursement and gender", "Number of cases of disability by type of disability", etc. While some of the entries are in English, others (especially, the legends) are in Arabic. This non-uniformity poses another problem in appreciating the data sets in terms of their interpretive value. Besides complicating the data analysis, such data sets are also problematic as far as the periodization is concerned because the data are outdated.

The inaccuracies are more glaring in other aspects too. For instance, to view a "Map" based on select indicators (Indicator: General Census of Population; Age group: 30-34; Sex: Total%; Nationality: Omani) in the Population category [Retrieved from], the error message returns as "No data: Your current selection does not contain any data. Please modify your selection to view map." Furthermore, while we may share the data set on Twitter, the link for Google + does not work. Therefore, social media connectivity is starkly missing. If we explore the data sets on "Corruption", the results are displayed without any legends and authorship or the date of publication. Only the hyperlink [Retrieved from] indicates that the results shown are of the Majlis members. In the "Public Safety" category, we have two excel files wherein one of them is labeled as "List of Police Station" and the other is labeled as "Accidents". In the "List of Police Station", only phone numbers and fax numbers are provided but some of the entries are missing. For instance, phone number is missing for "Civil Defence, Al Buraimi". Likewise, phone numbers of "A' Dukum Police Post" has been mentioned as "9381682" and phone number of "Seeb International Airport Security" has been provided as "519217". Both these entries are misleading. In the other file on

"Accidents", we have a "Table" and a "Chart" and both have missing entries, absence of legends, no date and authors. We are unsure if the accidents are caused by motor vehicles or heavy vehicles. We have no data for 2016 and 2017. Certainly, these open data sets are unfit for usage.

6. Conclusion

The main purpose of this paper is to underline the nature and scope of the Open Data initiative in Oman. Drawing examples from select data sets via the portal dedicated for the same, we deduced that Oman's Open Data Initiative is beset with a number of problems. There are many problems in these open data sets and this leads to the unsuitability of these data sets for proper usage. Therefore, the commitment of the country towards unleashing the power of OGD is questionable. Whereas studies have underlined the immense benefits which may be derived from OGD (See Saxena, 2016, for instance), Oman government is yet to appreciate the value of OGD. It is important that besides encouraging the government departments to open their data sets, the government should improve upon the IT infrastructure. Therefore, it is important that the government take serious measures for furthering and improvising the Open Data Initiative in the country. Whereas the concerned authorities espouse the OGD policy in terms of different dimensions, the actual commitment is missing. With examples in plenty where the data is missing or irrelevant or there is no mention of the authors or the date when the data was published, the credibility of the data becomes questionable. Also, with the latest technological development, Oman needs to institutionalize the OGD initiative and institute measures for providing data on a real-time basis. Conceding that the entire Middle East is reeling under pressure owing to plummeting oil prices, Oman should conceive of measures of diversifying its economy in non-oil sectors with the help of OGD. OGD may spearhead the country into economic development and generate public value through innovation. Hence, it is important that the country forge ahead in its bid to tap OGD at its best.

6.1. Limitations and future research directions

This study was a single case-study and it sought to underline the nature and scope of OGD in Oman. Therefore, the generalization of this study is not possible. Further studies are required for making a comparative assessment and identifying the benchmarks for a sustainable and robust OGD initiative in Oman. Second, we did not undertake a quantitative analysis and the study was exploratory in nature. In-depth interviews with relevant stakeholders or experimental research may inform further research. Third, we did not cover the technical dimensions of the OGD here. For instance, we did not appreciate the role of meta data, APIs, mash ups, etc. Oman does not hold any contests or hackathons for involving the citizens in the OGD initiative. Further studies may undertake a feasibility study to look into the aforesaid dimensions for promoting interest and engagement among the prospective users of OGD. Finally, OGD is known to have economic value. Further research is required to assess the utility of OGD for Non-Governmental Organizations (NGOs), private sector, entrepreneurs, Small and Medium Enterprises, etc. and how can such incentivization facilitate the economic diversification of Oman.

6.2. Implications for practitioners and academicians

The present study holds implications for practitioners and academicians alike. Policy makers should be able to appreciate the significance of OGD for the societal transformation as well as improving citizen-government interaction. Transparency holds the key to efficient government and government should strengthen its resolve to chart a robust path for the OGD policy in Oman. By opening more and more data sets, the government stands to gain by making the government truly accountable to the citizens. Therefore, OGD initiative of Oman needs to be

bolstered. Likewise, academicians are encouraged to conduct their research in a more forthcoming manner and push the agenda of OGD in Oman by underlining the prospective avenues for improvisation of government initiatives for societal betterment.

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