

Open government data intermediaries for service delivery: e-skills policy implication

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Abstract

The idea of using open government data (OGD), among others, for effective service delivery, is increasingly gaining prominence particularly in developing countries. Since OGD is delivered and accessed by the use of the contemporary information and communication technologies (ICT), notably the Internet, means that the providers of OGD (e.g. governments and agencies) and beneficiaries (e.g. citizens) must possess certain e-skills in order to provide and use OGD effectively. However, the intended beneficiaries of OGD, the neediest citizens, are not yet able to use these data independently as many of them do not possess requisite e-skills. They will, therefore, not be able to use OGD to influence much-needed service delivery in any meaningful manner. According to this study, this e-skills chasm can be temporarily bridged by introducing OGD intermediaries, who also should possess and also be able to transfer certain e-skill. As this topic has not yet been addressed by the South African e-skills agenda, this paper brings discussion regarding the place and role of intermediaries in the future e-skills policymaking.

Keywords: Open Government Data, intermediaries, e-Skills, policy implications, service delivery.

Introduction

The provision of public services remains a key occupation for governments as services underpin human welfare and drive economic growth. Services such as education, healthcare or community safety not only provide citizens' requirement but also represent an interface for shaping the self-same citizen's sense of trust in, and expectations of, government (OGP, 2017). Citizen-centric public services need to be timeously delivered with integrity while being responsive to their needs, particularly the needs of the most vulnerable communities. By enabling ordinary citizens to assess the quality, adequacy and effectiveness of basic services, to voice their needs and preferences and to allow them opportunities to offer improvements and innovation, provides an opportunity for better use of public funds, while improving service delivery. This also provides greater transparency (Ringold et al, 2013)

In this era dominated by modern information and communication technologies, citizens are connected like never before and have the passion to solve problems. Local people often possess the context-sensitive know how of what the solutions to problems in their area should be, but are rarely empowered by bureaucratic and even hierarchical processes. They instead experience inadequate public services that are impersonal, irrelevant, and inefficient (OGP, 2017).

Technology and open data engender a different kind of participation. The concept of open government data (OGD) is a subset of the notion of open data and represents the use and re-use of government data (Ubaldi, 2013) in order to empower government agents to promote a better life for citizens (Goldsmith & Crawford, 2014). Opening government data allows anyone to write a citizen-facing application using government data, creating new interfaces to

the government, and opening up new possibilities (Lathrop & Ruma, 2010).. For example, Tanzania implemented a Water Point Mapping System to make rural water supply services more efficient and accountable. This example is has high relevance to many South African regions that are, in recent years, badly affected by drought and water shortage.

However, translating data into information and, consequently, an appropriate action is still challenging for many people in developing countries (Ringold et al, 2012). It is argued that “*data alone is not knowledge*” (Ohlhausen, 2014), hence certain requisite skills are required to transfer or even transform data into usable information and knowledge (Gomez & Heeks, 2016).

On the other hand, it is widely reported that the shortage of e-skills in developing countries, such as South Africa, inhibits and regrettably excludes citizen’s participation in the information society and knowledge economies (Binsfeld, Whalley & Pugalis, 2016; Mitrovic, Sharif & Taylor, 2014). Recent studies specifically confirmed a lack of skills relevant to effective provision and use of open data (Open Data Barometer, 2015; Davies, 2014; OECD, 2014).

By addressing these issues by exploring OGD consideration and mapping them to e-skills, Mitrovic (2015) suggested that vast majority of South African citizens in need for service delivery will not be able to acquire these skills in near term – without systemic policy-making interventions. Hence, there is a current need to involve and introduce a third party, i.e. OGD intermediaries, which can help the intended beneficiaries to use of OGD in order to positively influence service delivery.

However, these intermediaries should necessarily possess certain e-skills in order to perform their work effectively. Further the intermediaries may be used as a catalyst for (up)skilling the wider public. It is critical that, for a successful intervention, the placement of OGD intermediaries and their role in the policy-making should be clarified. This paper consequently contributes to the discussion on the place and role of intermediaries in the use of OGD for effective service delivery and possible policy-making implication.

Approach to this study

This study was a part of a larger international project dedicated to the building open data capacity through e-skills acquisition. As in the other phases of the project, this study deployed a qualitative, exploratory Case Study Methodology (Yin, 2009; Baxter & Jack, 2008). The decision for selecting this approach was supported by the facts that the intermediaries role in OGD is a recent phenomenon in an early stage of development (Janssen, Charalabidis & Zuiderwijk, 2012) and that e-skilling in the developing countries, such as South Africa, is very much contextually dependent (Mitrovic et al., 2012).

The sample consisted of 11 government officials (ICT professionals, middle-level managers and the departmental executives) and 40 citizens (ranged from small business owners and students to social workers, engineers, ICT professionals and legal advisors).

The ‘case’ or ‘unit of analysis’ (Miles & Huberman, 1994) in this study was the interviewee’s answer perceived to contain information relevant to the role of OGD intermediaries. The data were analysed using the Grounded Theory Methodology (GTM) method of identification and constant comparison of the emerging patterns as well as the ‘memoing’ technique for recording and comparing findings.

E-skills classification used in this study

Although e-skills are essential survival skills for the 21st century (Chinien & Boutin, 2011), there is still no commonly accepted definition of this concept. Hence, this study adopted South African National e-Skills Plan of Action (NeSPA, 2010) definition which sees e-skills as “...the ability to develop and use ICT within the context of a knowledge environment and associated competencies that enable the individual to participate in a world in which ICT is a requirement for advancement in business, government and civil society”.

As with the definition, there are also various classifications of e-skills, ranging from e-Literacy, Technological Literacy, Information Literacy to Media Literacy and professional ICT skills. After considering many sources, this study has adopted the classification of e-skills shown in Table 1.

Table1: Classification of e-Skills (Source: Mitrovic, 2015)

e-Skill	Description
<i>e-Awareness</i>	Relates to user’s awareness of ICT and appreciation of the relevance of these technologies in the information-based society. It is the capability to understand and adopt the lifelong-learning paradigm and the use of ICT as a medium to facilitate the individual or collective development of knowledge, skills and new capabilities in both social and professional life.
<i>e-Literacy Requisites</i>	Skills related to: (i) using hardware, software, networks and various ICT devices, (ii) identifying, accessing, organising, evaluating, interpreting, analysing, synthesising and applying information from all kinds of sources, (iii) understanding and dealing with the content of a variety of digital and non-digital formats.
<i>Data Literacy</i>	Skill related to finding, manipulating, managing, and interpreting data (including reading graphs and charts appropriately), draw correct conclusions from data in order to make informed decisions.
<i>e-User Skills</i>	Skills focusing on enhancing the efficiency of public and private sector knowledge workers.
<i>e-Business Skills</i>	Skills aimed at increasing organizational efficiency and productivity.
<i>e-Practitioners Skills</i>	Skills aimed at enhancing the capacity of public and private sectors to manage, support and service ICT. The detailed description of these, the highest level skills in this classification) skills can be, for example, found in the Skills Framework for Information Age (SFIA).
<i>e-Leadership skills</i>	Skills needed to understand trends and impacts in the virtual environment; develop appropriate organisational responses in order to maximise opportunities, efficacy and effectiveness; establish collaborative platforms within and across stakeholder boundaries; articulate need and opportunities to increase understanding and commitment.
<i>E-Astuteness</i>	The capacity to continuously appropriate ICT and e-skills into personal work, education, business, social and family contexts in order to take personal advantage of the use of ICT and information.

This classification was used by Mitrovic (2015) for mapping e-skills against the OGD considerations and identifying the place and role of intermediaries in this context. Table 2 shows e-skills needed to address the identified OGD provision and usage considerations.

Table 2: Mapping e-Skills to OGD Considerations (Source: Mitrovic, 2015)

OGD Area of Consideration	Needed e-Skills
Open Government Data Provision	
<i>Strategy and Policy-making</i>	<i>e-Awareness e-Leadership skills e-User Skills</i>
<i>Data management</i>	<i>e-Practitioners Skills Data Literacy e-Business Skills</i>
<i>Quality aspect of data</i>	<i>e-Practitioners Skills Data Literacy</i>
<i>Standards</i>	<i>e-Leadership skills Data Literacy</i>
<i>Ecosystem</i>	<i>e-Leadership skills e-Practitioners Skills Data Literacy e-User Skills</i>
<i>Data Maturity</i>	<i>e-Practitioners Skills Data Literacy</i>
<i>Benchmarking and evaluation</i>	<i>Data Literacy e-User Skills</i>
<i>Issues and Challenges</i>	<i>e-Leadership skills e-Practitioners Skills Data Literacy</i>
<i>Barriers and negative sides</i>	<i>e-Leadership skills e-Practitioners Skills Data Literacy</i>
<i>Legal issues</i>	<i>e-Leadership skills</i>
Open Government Data Usage	
<i>Search and Access</i>	<i>e-Awareness e-Literacy Requisites skills</i>
<i>Interpretation</i>	<i>e-Literacy Requisites Data Literacy</i>
<i>Application</i>	<i>e-User Skills e-Astuteness</i>

As seen in the above table, the use of OGD for service delivery requires awareness of existence and benefits of OGD as well as the awareness of needed e-skills for an effective use of OGD. The beneficial use of OGD also requires basic e-literacy skills as well as data literacy, e-user skills and the astute approach to the technology and its application. In other words, insufficient data literacy and e-skills can affect the development of OGD agendas (Piovesan, 2017). However, all these skills are still unobtainable by vast majority needing service delivery, hence requiring the involvement of a third-party - OGD intermediaries.

The place and role of intermediaries in the OGD and e-skills context

The notion of ICT intermediaries appeared in the 1980s. These intermediaries are nowadays seen as the party positioned between data providers and users (Janssen & Zuiderwijk, 2014), which help users access information that is publicly available by locating these resources, integrating various sources on a specific topic, structuring these findings into a form understandable by interested users and disseminating it back to them (Sein and Furoholt, 2012).

In the context of this study, intermediaries are seen as one of the key stakeholders in the OGD ecosystem. They can also be labelled as *users* of OGD since intermediaries are best suited to connect other two key stakeholders: (i) government agencies and department, which can be regarded as the *providers* of these data, and (ii) citizens needing effective service delivery, which are considered as *beneficiaries* of OGD initiatives (Diani, 2013).

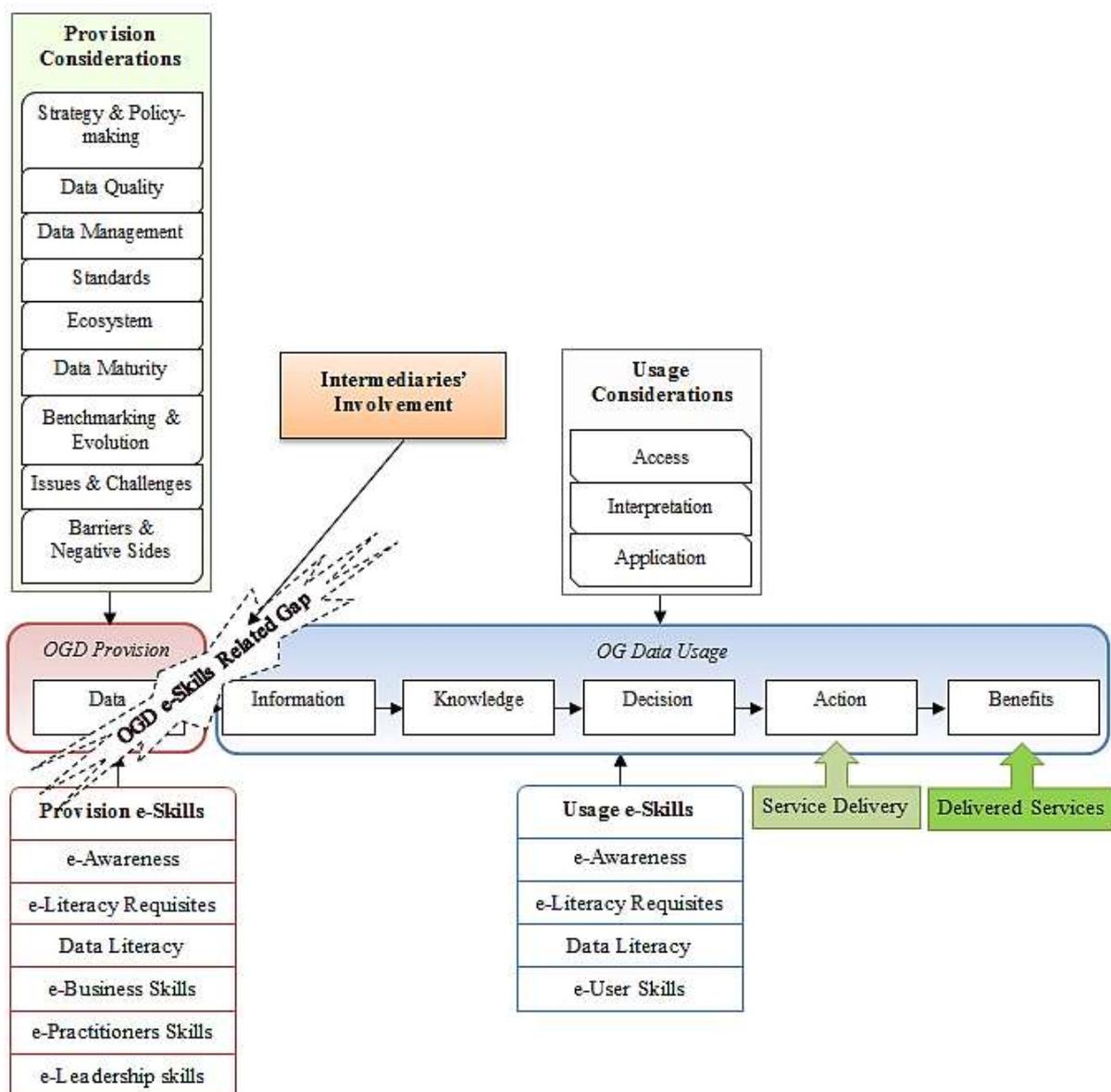


Figure 1: Intermediaries e-skills bridge for effective service delivery (Source: Authors, based on Mitrovic, 2015)

The role of OGD intermediaries is to create a symbiosis between the data providers, provided data and data users and beneficiaries. It is, however, obvious that those intermediaries must be e-skilled, possessing, at least, sound e-Literacy Requisite skills as well as Data Literacy skills.

Since data literacy in many developing countries, such as South Africa, is low, the continued advancement of open data intermediaries can be seen as a key area of capacity building in developing economies (Verhulst & Young, 2017). The absence of the e-skills can severely impact on what people are able to do (Sen, 1980) so it will inevitably contribute to a widening of the Data Divide chasm, represented as 'OGD e-Skills Related Gap' (Figure 1).

To avoid such a development, the role of intermediaries with skills to convert data into information is seen as highly significant: "...most open data initiatives are designed in a way that end-users either need technical skills or need to rely on an intermediary, in order to extract information from datasets" (Davies, 2014). Converting complex numerical data into easily comprehensible visualizations is an example of intermediaries helping ordinary citizens to beneficially use OGD for influencing service delivery (Verhulst & Young, 2017). The KZN e-Skills CoLab, refer to "comprehensible visualisations" as cognitive data. They recognise that cognitive data achieves knowledge transfer in a far more intuitive manner than equations and graphs and has created a course towards this goal.

Exploring the role of OGD intermediaries in South African universities, Van Schalkwyk et al. (2014) found that they can play important roles in the OGD ecosystem by (i) increasing the accessibility and utility of data; (ii) assuming the role of a 'keystone species' in a data ecosystem; and (iii) having the potential to democratise the impacts and use of open data.

The real-life role of intermediaries in unleashing value from open data is nicely illustrated through the story of the Medicine Price Registry Application (MPRApp) used in South Africa, which was enabled by South Africa's legislative framework that promotes and enacts transparency in medicine pricing. Such a framework compels the Department of Health to collect and publish data on medicine prices in South Africa, ensuring that the supply side of the MPRApp will continue to be made accessible, allowing the intermediary organisation 'Code for South Africa' to focus on improving the tool and getting it into the hands of its intended users (Verhulst & Young, 2017). Using already built trust with their patients (social capital) doctors and pharmacists helped to alert citizens to the database and the potential for identifying much cheaper generic drugs to treat their ailments.

Intermediaries e-skills related policy implications

This study has shown that the OGD intermediaries are a necessity if we are to overcome not only the resource disparity between those more affluent and disadvantaged communities, but also being able to help and equip such community members with e-skills that will help them to make sense of OGD and, hopefully, positively affects their lives. With the support of intermediaries, which are able to develop new skills and tools, aimed at translating raw data into information for a broader constituency (UN, 2014), citizens, particularly those in need for service delivery, will become better informed about the value, influence and latent power of OGD.

The OGD intermediaries will also help in raising the awareness of citizens about both OGD and e-skills needed for an effective use of OGD for service delivery. The increased awareness

can motivate citizens to become involve in and support advocacy initiatives related to joined OGD and e-skills interventions.

Furthermore, the OGD intermediaries can not only help citizens in making sense of already provided OGD and sharing this information with wider public (Halonen, 2012) but also in determining needs for future OGD ((Davies, 2014; Nugroho, 2013). In this regard, Mitrovic (2015) suggests that the role of intermediaries does not end with the use of the provided and demand for future OGD – the intermediaries’ role can be extended to help e-skilling beneficiaries of OGD in community most needing service delivery.

However, in order to provide OGD-related skills to a very large number of citizens in South Africa, a more systemic approach is needed. Since this task is voluminous and too complex for solitary work of government, business or civil society (‘in-silo approach. Instead, a multi-stakeholders collaboration is needed, as it is described in the South African National e-Skills Plan of Action (NeSPA 2010 and NeSPA 2013). The reports on OGD also suggest that such a complementary, coordinated method that involves many stakeholders is likely to yield higher returns (Tanriverdi & Ruefli, 2004; Kuk & Davies, 2011). Hence, it can be concluded that this amalgamation of OGD stakeholders, including OGD intermediaries, is likely to effectively influence the beneficial use of OGD for service delivery.

Furthermore, intermediaries that are trusted by actors in different networks (such as previously mentioned doctors and pharmacists) are able to bridge discreet networks thereby creating new linkages. They are, hence, regarded as a proxy for enhancing social capital (Van Schalkwyk et al., 2016; Verhulst & Young, 2017) and, in turn, social cohesion (Mitrovic, 2010). This corresponds with the NeSPA (2013) recommendation for “*the use of ICT and e-skills for connecting people and helping them to maintain and strengthen social ties between family members, friends and communities; assessing the appropriation of e-skills for participation (e.g. e-Participation and e-Democracy), which has an important contribution to make in the evaluation of the readiness of individuals and communities to cohesively support the national, provincial and local development agendas*”.

On the same topic, Thakur (2015) suggests that e-voting, which uses technology to capture a vote and technology to tally the votes, requires a change in the law, and a huge initial capital injection. This may be a long way off, given the relatively peaceful and scandal free elections, and the recession. However, Thakur and Singh (2017) suggest that e-participation is an enticing engagement method to recreate Town square democracy using pervasive mobiles, by offering e-referendums which may well reengage and involved citizens. This participative decision making reinforces democracy and reduces hierarchy and bureaucracy as alluded to before.

Mitrovic (2015), however, warned that OGD intermediaries cannot be a substitute for e-skilling citizens for beneficial use of open data, in general, and OGD, in particular. If not considered temporal, there would be a risk of intermediaries doing the work ‘for’ or ‘to’ the beneficiaries, rather than helping them to do it by their own (Twidale, Blake & Gant, 2013). The concern of ‘doing for’ also includes possible bias or unintentionally inaccurate interpretation of data by intermediaries.

In the South African e-skills context, it is also recognised that “*in democracies and in most centrally managed societies, no amount of provision (doing to), or support (doing for) can succeed without a social, cultural and economic contract (doing with)*” (NeSPA 2013). As it

is further elaborated in NeSPA (2013), “*at the centre of this contract lies individual and collective capability to maximise current circumstances in ways that are responsive to both: current and future individual and collective needs*”.

Intermediaries, hence, should only be an initial go-between, bringing communities into knowing and learning about the OGD agenda. In this relationship, intermediaries’ role should be to help citizens build the capacity to use and extract value from OGD by their own. In other words, OGD intermediaries should not be a substitute for e-skilling citizens but rather a party that help them to become independent in accessing, adopting and appropriating open data of any kind.

Conclusion

Being an integral part of OGD ecosystem, intermediaries represent an important link between the providers of OGD, provided OGD and beneficiaries of this initiative, particularly those in need of service delivery. Since these vulnerable communities do not have requisite skills to make sense of OGD on their own, they have to rely on intermediaries to help them to positively influence service delivery. On the other hand, these intermediaries should possess certain e-skills and social influence (social capital) in order to perform their helping role. Furthermore, OGD intermediaries can be a catalyst in e-skilling wider population but, for that, certain policies that link e-skills and OGD initiatives must be in place. In that regard, we have provided several suggestions that might help the policy-makers to amalgamate these two initiatives in South Africa.

Reporting only on a part of the wider study, this paper solitary brings an embryonic discussion on the topic. Hence, we suggest that the topic is explored further in order to increase generalisation and reach of this study.

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