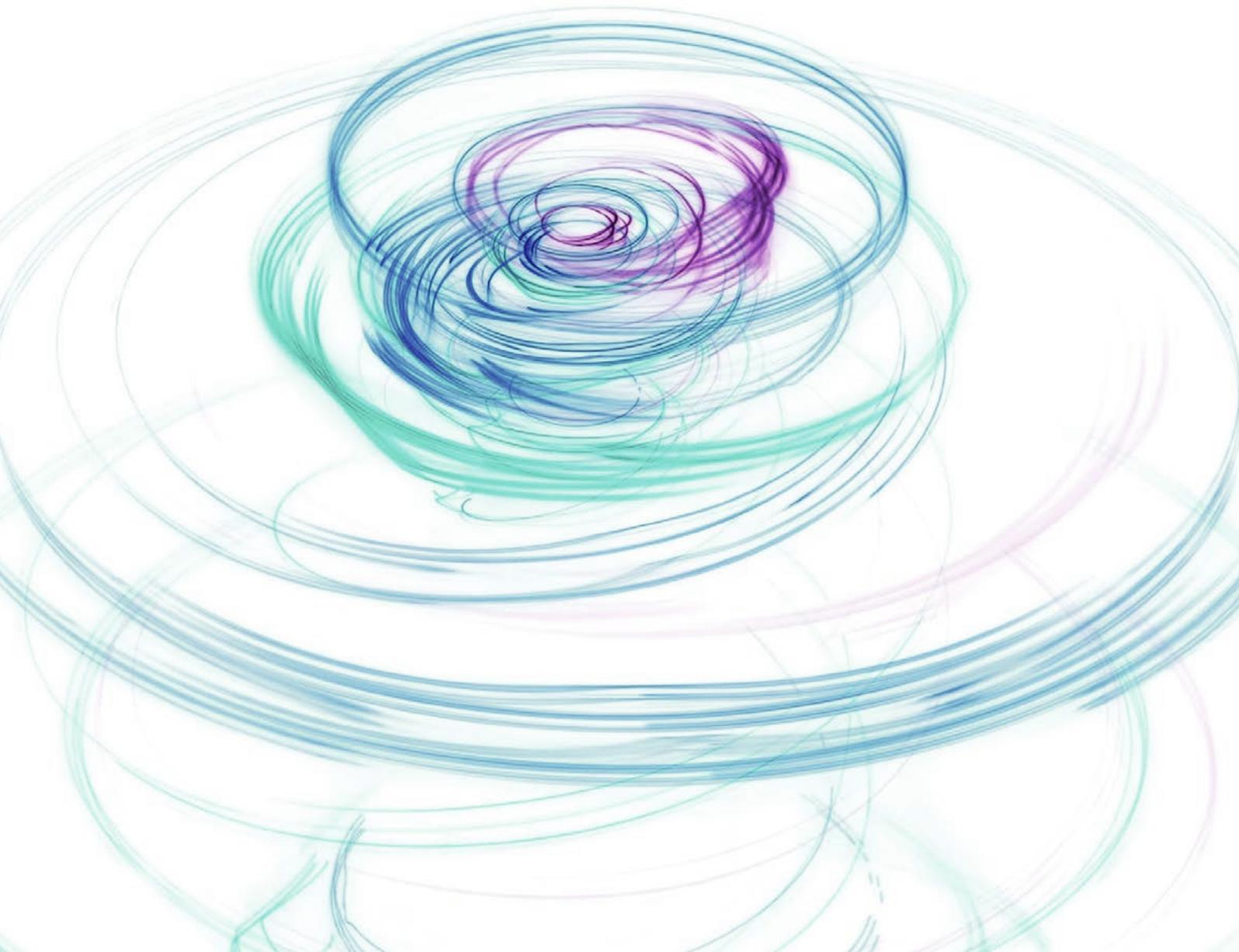# OPEN DATA
INTERMEDIARIES
IN DEVELOPING COUNTRIES

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CONTENTS

ABSTRACT

The roles of intermediaries in open data is insufficiently explored; open data intermediaries are often presented as single and simple linkages between open data supply and use. This synthesis research paper offers a more socially nuanced approach to open data intermediaries using the theoretical framework of Bourdieu's social model, in particular, his concept of species of capital as informing social interaction. The study is based on the analysis of a sample of cases from the Emerging Impacts of Open Data in Developing Countries Project (ODDC) project. Data on intermediaries were extracted from the ODDC reports according to a working definition of an open data intermediary presented in this paper, and with a focus on how intermediaries link actors in an open data supply chain. The study found that open data supply chains may comprise multiple intermediaries and that multiple forms of capital may be required to connect the supply and use of open data. Because no single intermediary necessarily has all the capital available to link effectively to all sources of power in a field, multiple intermediaries with complementary configurations of capital are more likely to connect between power nexuses. This study concludes that consideration needs to be given to the presence of multiple intermediaries in an open data ecosystem, each of whom may possess different forms of capital to enable the use and unlock the potential impact of open data.

1 INTRODUCTION

As public institutions open up vast and complex datasets, the expectation is that our lives as citizens will improve as a consequence of the data being made publicly available. However, there are several stumbling blocks in the path of extracting the benefits from open data. On the side of the provider these barriers may include the effort and cost required to convert closed to open data; the cost of providing a user-focused context to ensure the uptake of complex datasets; poor data quality; absence of legal and policy frameworks; a lack of capacity to implement and sustain open data practices; and resistance by data custodians to opening data (Janssen 2011; Magalhaes et al. 2013). On the side of the data user, barriers include lack of access, low levels of data literacy, lack of human, social and financial capital to effectively use open data, and also to open up and combine several datasets that together can create value for citizens (Gurstein 2011; Magalhaes et al. 2013; Canares, 2014).

To remove some of these barriers and, in so doing, to unlock the potential of open data, open data intermediaries are seen as playing a crucial role in linking complex open datasets with user needs. According to Van Schalkwyk et al. (2014) their presence in the open data ecosystem stimulates the flow of open data between actors in the ecosystem. Roberts (2014) points out that:

> [C]itizens will be more dependent on third parties – groups that I will call trusted intermediaries – to assure that transparency policies are maintained, and help make sense of information that is accessible through transparency policies. [. . .] [O]ur dependence on intermediaries will increase, and this will raise the difficult question of whether such groups

can acquire the resources needed to do the job of intermediation properly.

And according to Davies (2014):

> Intermediaries are vital to both the supply and the use of open data. ... Intermediaries can create data, articulate demands for data, and help translate open data visions from political leaders into effective implementations. Traditional local intermediaries are an important source of information, in particular because they are trusted parties.

Yet, the different roles that intermediaries may assume in an open data ecosystem and how they are able to intermediate, has received limited attention. This synthesis research attempts to develop a more nuanced understanding of open data intermediaries in developing countries with a particular focus on how intermediaries connect actors and facilitate the flow of data.

The concept of intermediaries in the context of ICT research was first mentioned in the 1980s, but more as a process of intermediating, than as a collective description of persons and organizations performing the role of intermediation (Tuula 2008). The function of intermediaries was at the time considered critical to produce, launch, scale and popularise innovations by transmitting information from one supplier to another. Thus, intermediaries are viewed as bridging organizations (Sapsed et al. 2007), brokers (Hargadon & Sutton 1997), agents (Howells 2006) or support organizations (Brown & Kalegaonkar 2002). Among these definitions and descriptions, there is one binding narrative – that an intermediary is located between two or more parties.

The different roles

that intermediaries may assume in an open data ecosystem and how they are able to intermediate, has received limited attention in research. This synthesis research attempts to develop a more nuanced understanding of open data intermediaries at work in developing countries with a particular focus on how intermediaries connect actors and facilitate the flow of data.

In terms of providing explanations for the existence of intermediaries and the functions they perform, Sein and Furoholt (2012) capture a widely held view on intermediaries: Intermediaries "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 to them". Janssen and Zuiderwijk (2014) in their study on what they describe as "infomediary business models" also regard intermediaries as creators of value positioned between data providers and data users. They also point to the fact that intermediaries are vital in systems that become ever more complex resulting in greater levels interdependency between multiple agents as specialization intensifies. Sein and Furoholt argue that, in the case of e-government and governance, intermediaries are critical in the "diffusion of services (Al-Sobhi et al. 2010), reducing corruption (Bhatnagar 2003), moderating discussion on democracy (Edwards, 2002) and providing e-government, services of various types (Bailey 2009; Gorla 2009)." It is also in these case studies that a new intermediary function was mentioned – what is referred to as "offline intermediaries".

There is a tradition of research and advocacy organisations working with government data that predates the open data movement. These organisations have traditionally facilitated access, use and communication of insights from government data among various non-governmental agencies. These prototype intermediaries include the media, civil society organisations and researchers. A study of the data practices of research and advocacy organisations working with government data has revealed the crucial potential of such organisations to enrich the supply of *open* data in the data ecosystem (Chattapadhyay 2014).

Focusing on what drives such ecosystems, Fransman (2010) draws on the work of evolutionary economist Joseph Schumpeter to describe ICT as a sectorial ecosystem within the larger socio-economic ecosystem. He identifies the dynamically interacting organisms in the ICT ecosystem including firms, non-firms, consumers and intermediaries bound by exchange as well as by the institutions (the repositories of rules, values and norms) in which they are embedded. Key to his exposition of the ICT ecosystem is that the ICT ecosystem is driven by innovation (i.e. the injection of new knowledge into the ecosystem). Firms compete and co-operate symbiotically, and the interaction between firms and consumers (that is, between knowledge creators and knowledge consumers) generates new knowledge which leads to innovation in the ecosystem. It is the pursuit of innovation that keeps the ICT ecosystem in motion. Of relevance here is research by Intarakummerd and Chaoroenporn (2013) on intermediaries and their role in innovation in a developing-country context. Their findings highlight the role of intermediaries in compensating for a lack of social capital in innovation systems.

While the aforementioned studies have all in some way focused on intermediaries, only a handful have focused specifically on *open data* intermediaries.

Van Schalkwyk et al. (2014) in a study on the use of open data in the governance of South African public universities hint at an intermediaries in this data ecosystem relying on personal connections (or social capital) to enable the flow of data to potential data users from a closed government data source.[1] Open data intermediaries are found to play several important roles in the ecosystem: (i) they increase the accessibility and utility of data; (ii) they may assume the role of a 'keystone species' in a data ecosystem; and (iii) they have the potential to democratise the impacts and use of open data. The article concludes that despite poor data provision by government, the public university

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1   This case is explored in more detail in the section Layers of Intermediation in this report.

governance open data ecosystem has evolved because intermediaries in the ecosystem have reduced the viscosity of government data.

In response to the under explored power dynamics in the open data discourse, Johnson (2013, p. 12) draws attention to the notion of "disciplinary power" and the potential of power to entrench existing injustices in a data ecosystem:

> The opening of data can function as a tool of disciplinary power. Open data enhances the capacity of disciplinary systems to observe and evaluate institutions' and individuals' conformity to norms that become the core values and assumptions of the institutional system whether or not they reflect the circumstances of those institutions and individuals. […] [T]he surveillers and sousveillers evaluate all institutions according to the norm […] and the institutions internalize the norms and orient their actions to them. With the norms reflecting the power structure of the society in which they developed, they reiterate the injustices that open data set out to ameliorate.

By promoting multiple, even conflicting, information systems, by including multiple actors in the design of such systems and by broadening the range of data analysers, the undesirable effects of embedded norms and values are more likely to be ameliorated. Intermediaries, it would appear, have an important role to play in this regard not only by analysing data themselves and in so doing broadening the range of data analysers, but also increasing the range by making the data available to a much broader secondary audience of data users.

Two studies have set out to identify types of *open data* intermediaries that may be active in a particular data

ecosystem. Magalhaes et al. (2013) provide a typology of open data intermediaries consisting of three basic types: civic start-ups, open data services and infomediaries. However, their open government intermediaries' framework does little to identify the unique characteristics of each of the intermediary types; nor does their framework provide insight as to the incentives or motivations for intermediaries entering into the ecosystem. Deloitte Analytics (2012) in their open data 'marketplace' identify aggregators, developers, enrichers and enablers as playing intermediating roles. Only two organisational types populate their intermediary category: application developers and businesses.

While the Deloitte report acknowledges the complexity (and the opportunities inherent in this complexity) of open data supply and use, neither their typology nor that of Magalhaes et al. (2013) attempts to capture the full complexity of open data supply, intermediation and use. For example, neither make reference to contexts outside of the developed world where open data practice may be promoted or stifled by very different contextual factors or require of intermediaries different attributes in order to link supply with use.

It is apparent from this brief overview of the literature that few studies focus on *open data* intermediaries specifically, and that there is a lacuna in terms of empirically-based research that attempts to explain the behaviour of open data intermediaries as key actors in data ecosystems. The research question of this synthesis study are therefore as follows: How do open data intermediaries promote and/or enable the flow of open data in developing country contexts in order to increase the probability of open data use and impact?

2 CONCEPTUAL FRAMEWORK

Given the limited amount of research on open data intermediaries and the requirement for a stable and robust understanding of what an open data intermediary is in order to operationalise the research question, we present a working definition of an open data intermediary.[2]

The definition of an open data intermediary used in this paper is as follows:

> An open data intermediary is an agent (i) positioned at some point in a data supply chain that incorporates an **open** dataset, (ii) positioned between two agents in the supply chain, and (iii) facilitates the use of open data that **may** otherwise not have been the case.

A narrow definition of open data exists in the form of the Open Definition.[3] Broadening the definition creates space for contestation founded on contextual variances. For example, an unequivocal position on open data being machine-readable or an insistence that a lack of explicit licencing limits the uptake of open data are contested. It is therefore important that the definition presented here is not conditional on a particular understanding of what open data is (Davies 2014). The definition presented here is therefore intended to be agnostic; in other words, the definition of an open data intermediary is not dependent on the definition of open data.

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2   This definition has been formulated based on the insights gained from examining the ODDC cases. In addition, the definition benefited from the input of a broad range of stakeholders at three separate workshops, one in Berlin in July 2014, a second in Guimaeraes in October of the same year, and a third in Jakarta in February 2015.

3   http://opendefinition.org/

It is implicit in the definition that there is a difference between an **open** data intermediary and a data intermediary. For an agent in the data ecosystem to be considered an open data intermediary, it is a requirement that open data be located at some point in a supply chain in the ecosystem (see Figure 1). The implication of this is that the end product in the chain may not necessarily be open. The defining condition is not the final data output's openness but that open data located at some point in the supply chain enabled the reuse of data.

Figure 1
Conditions for a data supply chain to be considered open

Source		End product	SUPPLY CHAIN	
			OPEN	CLOSED
Open	⇨	Open	✔	
Closed	⇨	Open	✔	
Open	⇨	Closed	✔	
Closed	⇨	Closed		✔

An open data intermediary may neither access nor supply open data but may nevertheless facilitate the flow of data in a supply chain by unblocking a process in the chain. For example, such an intermediary may broker an agreement between two agents in the supply chain without actually working with data in any way.

According to the definition presented here, internet service providers (ISPs) and cyber cafés are potential open data intermediaries. However, we would argue that there is a

variable degree of agency that can be attributed to open data intermediaries. Therefore, while ISPs and cyber cafés fulfil a valuable intermediation function by providing citizens access to data that may otherwise not have been the case, they do not exhibit a high degree of agency in fulfilling this function. We have for this reason chosen to exclude ISPs and cyber cafés from our analysis. A distinction between open data intermediaries and internet intermediaries is useful in this case. The OECD (2010) defines internet intermediaries as those who "bring together or facilitate transactions between third parties on the Internet. They give access to, host, transmit and index content, products and services originated by third parties on the Internet or provide Internet-based services to third parties". Using this definition Ebay, for example, can be considered an internet intermediary but, we would suggest, not an open data intermediary because Ebay does not, within its role, engage with open data sets.

Definition of an open data intermediary:

An open data intermediary is an agent (i) positioned at some point in a data supply chain that incorporates an open dataset, (ii) positioned between two agents in the supply chain, and (iii) facilitates the use of open data that may otherwise not have been the case.

3 THEORETICAL FRAMEWORK

Intermediaries as 'keystone species' is a concept present in the emerging literature on ecosystems as a useful framework for understanding the dynamics of open data systems (Harrison et al. 20120. The function or role of keystone species bears many similarities to those of intermediaries. Keystone species are considered crucial because their presence performs some vital enabling function in the ecosystem (Nardi & O'Day 1999:53), either as mediators, as actors who bridge institutional boundaries and translate across disciplines, or as creators of value in ecosystems by creating platforms, services, tools or technologies that offer solutions to other actors in the ecosystem (Iansiti & Levin 2004:7).

However, the biological ecosystems approach fails to capture inherent power dynamics, in particular the power imbalances and capital flows that exists in a social ecosystem. While ecosystems tend to equilibrium, all actors in the system are not equal. This is particularly evident in a developing country context, where the increased imbalance in the distribution of economic, social or cultural power may increase the importance of capital-laden intermediaries in facilitating the flow of data in the system and thus enabling data transactions between actors. It is for these reasons that the ecosystems approach, although providing some important insights into the relative positions of intermediaries in an ecosystem, may be less revealing in terms of why intermediaries connect actors in a social environment and what the roles and functions of intermediaries are in the dynamics of open data systems.

In this paper we adapt Bourdieu's model of space, fields, situations, habitus and capital as an alternative and, in our view, more promissory explanatory framework of

interactions that characterize actors, including intermediaries, in social systems.[4]

According to Bourdieu, the social world constitutes a multidimensional structure in which individuals are positioned depending on three relational, almost symbiotic, parameters: field (and its local variation, situation), habitus and capital. The social space is divided into a number of, fairly autonomous, fields. A field is a structured and dynamic portion of the space that is defined by its own rules and principles of action governing relations in which the actors can engage. It is a network of all direct and indirect, close and remote connections between actors. The notion of field also includes the actor's properties and their power structure, such as hierarchy and domination patterns, and all the types of capitals possibly employed. It is a system of objective coordinates in relation to positions – it is a multidimensional grid of possible stances and moves that an individual can adopt (Bourdieu & Wacquant 1992:97, Fox 2014:207). Therefore, in general terms, the field can be understood as an environment that constrains and, to a degree, determines the existence and motion paths of actors (either those who are already present or those who entering it), as well as the types of capital which they can

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4   Certainly, the ecosystem narrative can introduce the notions of predator and prey, as well as control over or access to energy resources (of any type) as metaphors for power and capital. Therefore, we do not discard the possibility that some versions of an ecosystem model may be employed for studying intermediaries. However, given that Bourdieu' theory of field, habitus and capital directly incorporates the ideas or power and assets flow or disproportion, and seems to be easily transposable to the situation of intermediation in a social context, we have chosen to use in this study.

employ to position themselves in this space (Bourdieu 1993, Reed-Danahay 2004, Wacquant 2006).

A *field* can also be imagined as an incessant battle for the position in the space (for instance, their hierarchical location) in relation to costs and profits. Agents (individuals or groups of them) compete to gain advantages by means of capital, available and meaningful to this portion of the space, and for maintaining or overturning the rules of the game regulating this field and thus its special distribution (e.g. hierarchy). It is, therefore, a conflict zone between those who strive to preserve the autonomy of the field (these actors usually want to preserve the dominant and well-established position they occupy and the *status quo* of the distribution of capital that enables it) with those who try to introduce less autonomous principles, seeking influence from external, neighbouring or even intruding and clashing fields (these actors, do not occupy a dominant position, but want to improve it by involving non-orthodox, heterogeneous and subversive forces that challenge the extant status quo) (Reed-Danahay 2004, Wacquant 2006).

It is evident that fields are not stable but inherently dynamic. This non-equilibrium property also stems from the inherently relational structure of a field. To be exact, a field not only determines the individuals' actions and the types of benefits' accumulation and conversion, but is also – simultaneously and in an inverse manner – conditioned by these individuals' habitus and the capital that penetrates and nourishes the field that jointly work towards preservation or disruption of this field.

Habitus is a complex of durable, observable and/or publicly expressed dispositions an individual develops given the field in which it exists. Habitus is usually analysed in terms of internal (cognitive) predispositions such as beliefs, perceptions, tastes, interests, opinions, etc. that characterize an individual or a collective body in response to external structures (e.g. familiar, social and educational milieus) found in the field. Habitus is thus a structure, embedded in an individual that emerges from all the actions an individual has performed or all the engagements he or she has been involved in during the whole life (Bourdieu 1990:53). It is a product of the entire past, a product that is, however, actively present as disposition (Bourdieu 1990:56). This means that habitus understood as a set of dispositions evolve by participating in a given filed and stem from the constraints imposed by it. Therefore similar experiences in a given field tend to yield similar habitus and, thus, can

characterize a whole group of people. But the influence of the field on habitus – and thus the dynamic constitution of habitus – is also regulated by the habitus itself, as habitus filter the field's impact. It is also responsible for continuity and discontinuity of a field since it can both inculcate and accumulate social behaviours typical of the field in individuals, and, having been modified, produce transformation and revolutions in the field (Bourdieu 1984, Wacquant 2006). This implies that habitus is both a structured patient (it reflects the field with its capital) and a structuring agent (it moulds the influence of the field and contributes to the maintenance or disruption of the field).

Since a field constrains habitus, being at the same conditioned by it, and inversely since habitus influences the field being simultaneously determined by it, habitus and field are entirely relational phenomena in the sense that they can only be analysed in relation one to another. Both contribute one to another and depend one on another. Habitus evolves over times due to the chaining field and contributes to the changing field as well. Habitus is a manifestation of the field that embeds and constitutes it, and the field embeds the habitus by which it is expressed and constituted. The intricacy of this relationship is interminable – both are situated simultaneously one in another and no one is given as primary.

If a particular habitus is fully harmonious with the filed in which it exists and remains in a so-called doxic situation that encourages, preserve and reproduces the current structure of the field, the field operates smoothly, because the individual fully respects the running of the system as natural and commonsensical. However, in cases where there is no correspondence between the habitus and the field, in which the former has been developing, some response is expected. This response can preserve the field, modify it, or disrupt it (Bourdieu 1984, Reed-Danahay 2004, Swartz 2002, Wacquant 2004:315-319).

Individuals (or a group of them) are positioned in the social space not only in respect to the two coordinates mentioned thus far, i.e. structure of the field to which they belong and their own habitus, which records actual stances (the path in the field) and predicts potential positions these individual can adopt, by also by the volume and type of the capital they hold. To put it simply, field and habitus depend on capital (Bourdieu 1990:119, Wacquant 2006).

Capital is another crucial element of the social space that both conditions and is conditioned by the other coordinates

such as field and habitus. Capitals correspond to the accumulation and/or convertability of advantages and are capable of discriminating agents because of their distinct positions in the field (Bourdieu 1984, 1986; Zhang 2010; Halford & Savage 2010). Traditionally, there are three main species of capital: economic, cultural and social. Economic capital usually involves economic assets (e.g. monetary value), cultural capital makes reference to knowledge and experience (e.g. competencies and qualifications), and social capital is understood as institutionalised connections or social networks with which an individual is bestowed (e.g. friends, acquaintances and memberships). There is also another, fourth type, referred to as symbolic capital which corresponds to any form of capital that is not regarded as such (e.g. respect, reputation and fame) (Bourdieu 1984, 1986, 1996:148, Wacquant 2006). Recently further species have been distinguished such as technical capital (Zhang 2010) and scientific capital (Langa 2006).

If an individual who possesses a type of capital exerts his or her power on an individual who possesses less, and gets him or her to perform an action, violence can take place. Violence occurs if the dominant imposes his or her principles (usually in a doxic situation, congruous with the functioning of the field and its maintenance, which perpetuates his or her domination) on the dominated. However, the relation may be less drastic and involve a trade where both parts can exchange their assets.

It is important to emphasise that capital does not have intrinsic value in terms of being advantageous but only makes sense in relation to a field in which it is employed. In one filed – or even for some of its agents – a given form of capital is highly advantageous, while in other fields its advantage is less or even worthless. Therefore, capitals can be converted so that the assets that are not advantageous in one field or in one of its sectors (e.g. among certain individuals) be advantageous in others. Capital, thus, corresponds to assets that not only are but that also may produce advantages (Halford & Savage 2010:944-945).

Capital – by being modified for distribution (transfer) or type (conversion) – can importantly structure the field in which it has been used: the change in the capital will modify the field and thus the habitus of its actors.

Sometimes, a mediating notion between field and the actors with their habitus is posited, namely a *situation*. This stems from the fact that a field can in fact involve a great number of possible practices that constraint actors

differently leading to formation of different habitus. In other words, actors never perform in fields as such but exclusively in the field's sub-section (a specific situation), which sometimes may be located in the border zone of two or more fields (Santoro 2011). Thus, a situation is a more fain-grained approach to the field-position of an individual which, contrary to autonomous fields, allows for fuzzy areas and mixing of generally independent spaces.

This exposition of Bourdieu's ideas demonstrates that an individual can be located in the social space by using three main coordinates: field (situation), habitus and capital. Not only individual, but the functioning of the entire system and, thus, the structure of power relations, depend on these three parameters. What is important is that the three are relational and interconnected, constantly influencing each other and shaping the overall system. As a result, the social space can be imagined as a complex, living body, possibly with self-organising properties and dynamic, unsettled, non-equilibrium behaviour (Fox 2014:207-210, Swartz 2002, Robbins 2002, Swedberg 2011, Wacquant 2006).

Using Bourdieu's ideas as a narrative model for intermediaries, the following can be postulated. The general environment in which data systems and their transmission take place in developing countries (with the structures found in a state, power relationships, existing individuals, physical and social arrangements, etc.) can be viewed as a relatively autonomous field. Each particular case of transaction constitutes a situation s in this general frame, in which two (or more) agents are involved: an agent α (possibly dominant due to possession of an asset in the form of data) with a particular habitus and capital (represented by a dynamic function $f(\alpha)$) and another agent β (possibly dominated due to a lack of material or symbolic resources expressed in general terms as a deficit) also with a determined habitus and capital (function $f(\beta)$). Both functions solve for the two agents, possibly predicting their most likely paths in the field and responses to its structure and possible situations in which they can actually engage. However, the relation between the two agents is possible in the situation s only (or principally) because an intermediary actor γ (with his or her own habitus and capital, and path $f(\gamma)$) emerges and affords for this situation in which the habitus of the agents α and β can meet and a transfer or conversion of capitals can take place. The more the path $f(\gamma)$ intersects with the path $f(\alpha)$ and $f(\beta)$ – i.e. the more proximate it is to the both sides of a transaction – the more likely it is that such a transaction will be successful.

4 RESEARCH METHOD

The study is based on the analysis of a sample of cases extracted from 17 published ODDC case studies. The sources of the data were the final reports published on the ODDC website.[5] Intermediaries were selected for inclusion in this study based (i) on the definition of an open data intermediary provided in this paper; and (ii) on the availability of sufficient data on the intermediary in question. 'Sufficient data' constituted published information on the value that intermediaries provide in order to link agents in a given open data ecosystem, in so doing promoting the use of data in the ecosystem.

Data were extracted by means of textual analysis of the ODDC case study reports. Where possible, the websites of intermediaries included in the study were consulted in order to supplement the data extracted from the case study reports. Analysis comprised of establishing the two agents between which an intermediary is located followed by an estimation of how the intermediary is able to connect between the two agents – in other words, deducing what types of capital the intermediary possesses to allow for a connection to be made. In order to make this estimation, the deficit of the recipient agent was inferred from the case study text, and a determination was made as to the value that the intermediary provided in order to connect asset-holding and deficit-exhibiting agents in the open data supply chain.

Data were captured in template tables in MSWord to allow for richer, more narrative data to be recorded as this was seen to be necessary in being able to determine what

types of transaction-enabling capital intermediaries possess. Tables were classified by field and the table template was structured to capture the following data on each intermediary: $Agent_{asset}$ (Name, Type, Asset); Intermediary (Name, URL, Organisational type, Value provided, Type of capital provided to enable the transaction, Revenue model, Incentive); $Agent_{deficit}$ (Name, Type, Deficit). See Appendix 1 for a template used for each intermediary.

Data were collected on 32 intermediaries; 27 from Asia and 5 from Africa. The preponderance of Asia-based intermediaries was due to the fact that ODDC case studies focusing on Asian countries focused more narrowly on intermediaries whereas the African studies tended to focus on other aspects of open data.

Limitations

The study has relied heavily on secondary data for its analysis. This secondary data took the form of case study reports produced for the Emerging Impacts of Open Data in Developing Countries project. The case studies were not conceived or written with intermediaries in mind, although most case studies relied on a conceptual framework developed by the project and this conceptual framework acknowledged the role of intermediaries in open data ecosystems.

Intermediaries may rely predominantly on one data source or they may draw on several data sources, both open and proprietary. In this paper, because of a reliance on existing case studies, the data source used by an intermediary

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5   http://www.opendataresearch.org/reports

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included in the case is often related to and confined by the focus of the case study. For example, if the case focused on budget data, then the case of a particular intermediary may only include in its description the use of a single government budget data source by the intermediary. However, this does not necessarily imply that such an intermediary does not extract and re-use data from other sources. In this sense, this paper is limited to a slice or cross-section of particular data supply chain in a specific data ecosystem as presented in the ODDC cases.

Our analysis may at times create the impression that open data supply chains are linear and/or static. This is clearly not the case. Descriptions are inevitably of a particular arrangement at a particular point in time; however this does not imply that the open data supply chains are not complex and dynamic.

5 FINDINGS & DISCUSSION

The findings of the examination of 32 open data intermediaries to determine types of capital possessed in order to facilitate a situation where the intermediary actor *γ* (with his or her own habitus and capital, and path *f(γ)*) emerges and affords for this situation in which the habitus of the agents *α* and *β* can meet and facilitate a transfer or conversion of capitals, are summarised in Table 1 below. (The tables containing the analysis of each of the 32 intermediaries are presented in Appendix 2.)

Table 1
Types of capital possessed by open data intermediaries in order to facilitate data flow in specific fields

Type of capital (n=32)				
Economic	Cultural	Social	Symbolic	Technical
9%	6%	31%	3%	97%

The value of capital in understanding open data intermediaries

From a theoretical perspective the findings support the use of Bourdieu's theories of social interactions (and his concepts of situations, habitus and, in particular, capital) as a narrative model for open data intermediaries.

In most of the cases analysed (97%), intermediaries deployed their technical capital to collect, digitise, clean, reorganise and translate data (most often from governments) into information. There was less evidence of other forms of capital being deployed. However, there is some evidence of technical capital being used in conjunction with economic (6%), cultural (6%), symbolic (3%) and social (31%) capital.

In Kenya, both government and donors supported the

Code4Kenya initiative to develop applications to increase the effective use of data. However, iHub's research shows that usage levels are paltry (Mutuku & Mahihu 2014). This could point to a preponderance and overemphasis on the value of technical capital in one field, and low levels of social capital among application developers in another field (where potential users are located). If developers/intermediaries possessed higher levels of social capital, this could make intermediaries more attuned to the needs of citizens and increase the likelihood of end-use. In other words, technical capital may enable a transaction, but the value of the transaction is limited by the fact that the transaction results in low levels of return for citizens. This finding resonates with that of Intarakummerd and Chaoroenporn (2013) who highlight the role of intermediaries in compensating for a lack of social capital in innovation systems in developing countries.

Arghyam, an Indian NGO that manages the India Water Portal, acknowledges the limits of its reach. It "works primarily through partnerships with non-profit organisations, CSR divisions of multinational corporations and the media; […and] with volunteers from a wide range of backgrounds, disciplines and locations, who contribute their valuable time and energy to the cause of spreading awareness on and sharing solutions for India's water problems."[6]

PRS in India relies only on technology to engage with citizens but holds workshops to engage with journalists. "Engagement with citizens is facilitated through the PRS Blog, Twitter and Facebook pages. Workshops are held for journalists on tracking the activities of MPs and MLAs. In

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6   http://schools.indiawaterportal.org/aboutus

addition, PRS provides inputs to the press and electronic media on the legislative agenda in Parliament, as well as data on legislative performance. Members of the PRS team are often approached to contribute columns to provide a perspective on various key Bills."[7] This could be indicative of PRS's social capital enabling links with the media but not necessarily with citizens.

In the case of the Accountability Initiative in India, there is evidence of an intermediary using its cultural capital to make successful use of right-to-information legislation in order to extract data from government: "The data has been collected through surveys and government owned data bases ... In addition, Right to Information applications were filed to secure access to information under the control of public authorities."[8]

Our findings and the examples provided above point to the value of different types of capital in connecting data supply and use. They also point to the limits of an overreliance on technical capital in connecting users with open data.

False intermediaries

Intermediaries may assume that they are providing value, and asset holders such as government and donors may hold a similar view. However, this amounts to a perception of value rather than actual value. While this study did not focus on the uptake of data or information by end-users, some of the cases in this study show that use, let alone effective use, is low. This may indicate a gap between perceived and actual value provided by open data intermediaries.

The distinction between actual and perceived use is a critical one as it is a determining factor in whether an agent can in fact be described as an open data intermediary. Based on the definition of an open data intermediary presented in this paper, an intermediary must be positioned between two agents in an open data supply chain. If an intermediary is located between an agent and a purported end user in the chain, but there is no evidence of the end user actually making use of the data, then the intermediary is not in fact an intermediary. In such a case, the ostensible intermediary is in fact the end user, and represents the last instance of agency in the open data supply chain.

7   http://www.prsindia.org/aboutus/what-we-do/

8   http://www.accountabilityindia.in/paisa_states

Our findings point to
the value of different types of capital in connecting data supply and use. They also point to the limits of an overreliance on technical capital in connecting users with open data.

Layers of intermediation

In South Africa, open data on public higher education performance is made available by two intermediaries (and closed data by a third intermediary) (Van Schalkwyk et al. 2014). The first intermediary in the supply chain has a long-standing relationship with key personnel in the South African government department responsible for collecting higher education data. This intermediary therefore possesses the social capital to access closed government data; data that the second intermediary would not be able to access (without recourse to legal proceedings). The first intermediary also possesses the technical capital that enables him to extract data from the complex data tables in the government database, and to reorganise, validate and repackage the data into formats usable by the second intermediary. The second intermediary has a reputation for producing high-quality research on South Africa higher education, and therefore possesses the symbolic capital to confer on the published data a high degree of reliability and confidence amongst end-users in the field. We therefore see two intermediaries using different types of capital to open and link a closed government dataset to a targeted user-group. (See Figure 3 for a graphic representation of how the two open data intermediaries connect the supply and use of data in this case.)

In the case of the Karnataka Learning Partnership in India, there is an explicit acknowledgement of the limits of technology in connecting with users: "The programme data and the Share-Your-Story component ... in its current form, excludes the majority of our intended target audience – the parents of children who go to government preschools and primary schools who are mostly illiterate and do not have online access due to lack of electricity,

computers, computer educators, Internet connections, local-language content etc."[9] In other words, while Karnataka has used its technical capital to consolidate and translate raw data into usable data, it concedes that this is only part of the task at hand. Given its target audience, it needs to deploy its social capital in other ways in order to connect the parents of school-going children to the information provided by the portal. Or it may lack the social capital in this field and will have to resort to soliciting a new intermediary with sufficient in the users' field in order to connect Share-Your-Story to parents.

These cases point to what we believe is an often overlooked and critical dimension in open data intermediation: intermediation does not only consist of a single agent facilitating the flow of data in an open data supply chain; multiple intermediaries may operate in an open data supply chain, and the presence of multiple intermediaries may increase the probability of use (and impact) because no single intermediary is likely to possess all the types of capital required to unlock the full value of the transaction between the provider and the user in each of the fields in play.

Based on our findings, and in line with the theory that influence is increased the closer an intermediary is to the source of power, we would suggest that proximity is an indicator of the extent to which open data intermediaries are able to intermediate effectively (Lorenzen 2006; Barnett & Duvall 2005). And proximity can be expressed as a function of the type of capital that an intermediary possesses.

However, because no single intermediary necessarily possesses all the types of capital available to link effectively to all sources of power in or across fields, multiple intermediaries with complementary configurations of capital are more likely to connect between power nexuses.

For example, an advocacy group may possess the symbolic or cultural capital required to apply effective pressure on government to release open data. However, the advocacy group will most likely lack the technical capital required to facilitate the publication of the data in useful formats. The tech community may lack the cultural or symbolic capital to negotiate effectively the publication of government data, but it is likely to have the technical capital required to develop applications or to interpret large datasets, i.e. to make the data usable. Neither the advocacy group nor the tech community may be well connected to the potential users of open data because both lack the requisite social capital in that field. Community-based organisation or professional bodies may possess the social capital required to access possible user groups and, as such, may function as effective user aggregators in linking open data to users.

The model in Figure 2 presents the multiple layers of intermediation between a data source and end-use, with each intermediary deploying its own relatively strengths as expressed by the type of capital it possesses in order to connect actors and to facilitate the effective reuse of open data.

Figure 2
A model of layers of intermediaries connecting a data source with users
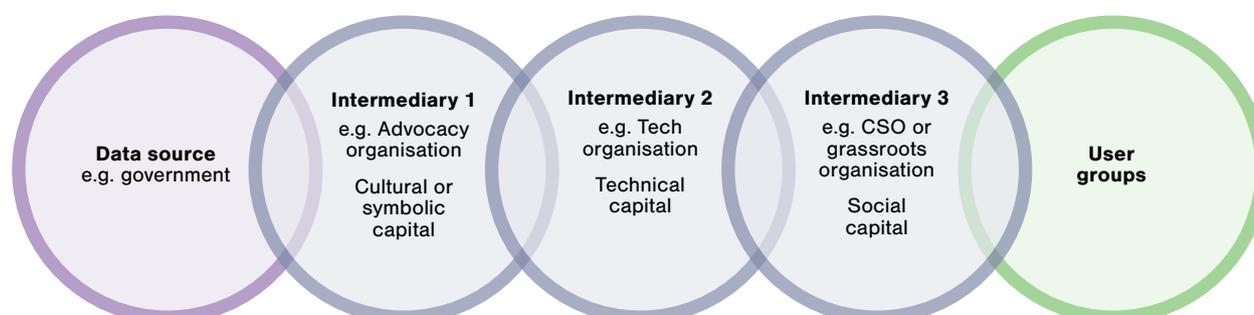
Figure 3
An example of how two open data intermediaries connect the supply and use of data

In Bourdieu's terms, given the complexity of the field, it is unlikely that the function $f(x)$ of the intermediary intersects ideally both with the function $f(\alpha)$ of the initial data supplier and the function $f(\beta)$ of the final data receptor(s) as these two latter may be topologically distant. Rather, it will intersect with the functions $f(y_1)$ and $f(y_2)$ of individuals that are proximate to it, in this field or situation. The more topologically ad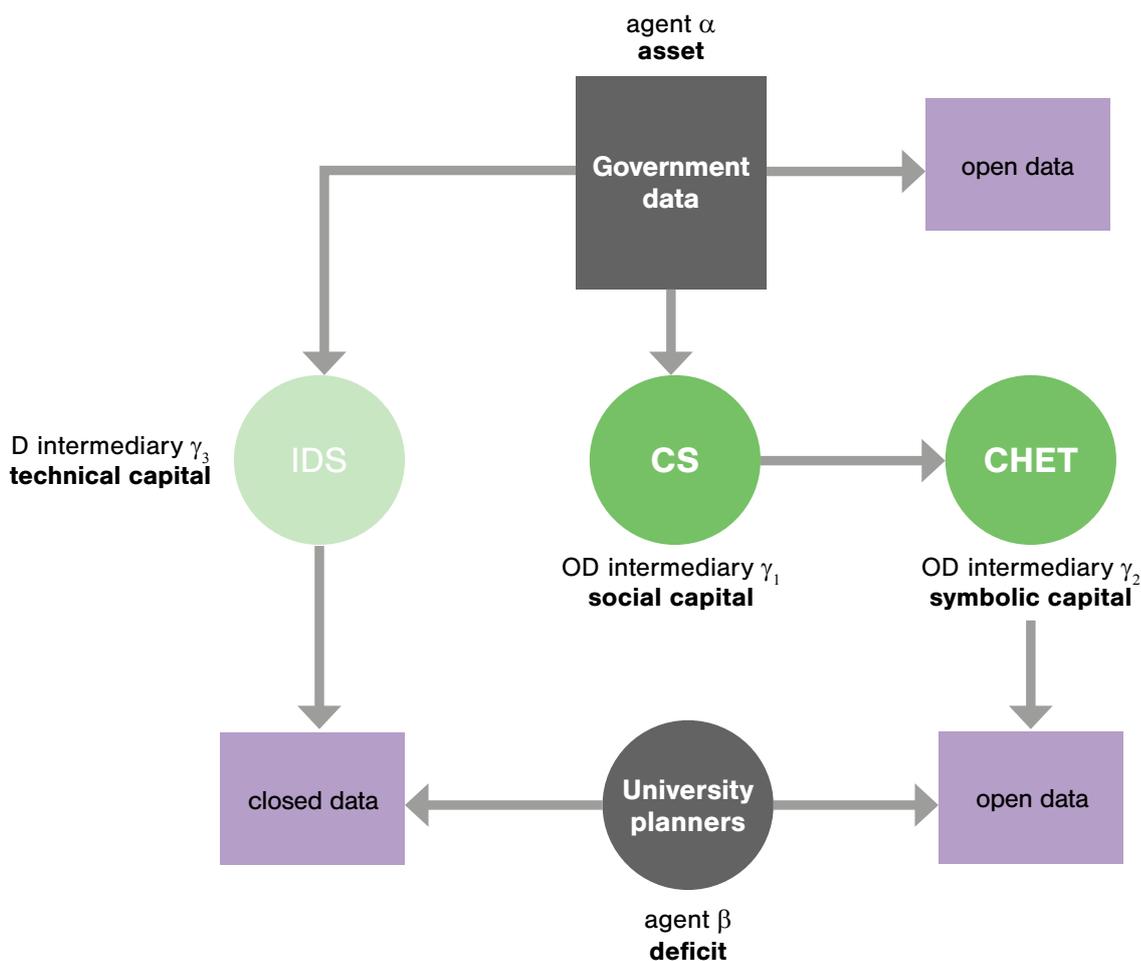jacent the functions of the interacting individuals are, the more likely the transaction between them – in this case, the flow of data – will be. Therefore, in order to ensure the transaction between the individuals α and β, a chain of topologically proximate functions $f(y_n)$ should be established, where each transactional link involves functions that typologically intersect. In short, the presence of multiple open data intermediaries may improve use and impact of open data.

We may further postulate that since different parts of the field (or different situations) are inhabited by distinct individuals with dissimilar habitus, they (these situations) may require different types of capital for transactions to be successful. The more remote the regions of the field are the more probable is that they will be governed by distinct forms of capital. What constitute assets at the initial portion of the data-flow chain (connection between the government and an intermediary), may not be so at its final fragment (connection between an intermediary and the receptor(s)). Inversely, the more proximate the individuals are, the more likely it is that their capitals will be similar or at least convertible. Thus, the fact of possessing a similar form of capital can be a tangible measure of proximity between the actors involved in the data flow. Accordingly, ensuring that two parts of each transactional link employ or are interested in an analogical type of capital (and hence ensuring their topological proximity) can importantly improve the data flow from the source to the final receptor, as the model directly relates the success of a transaction to the proximity of the actors involved in it.

In order to enhance the transaction between these technically specialised agencies (intermediaries) with the data suppliers (e.g. governments) and data users (e.g. individuals), who are less responsive to technicalities, but who are more concerned with symbolic and/or social forms of capital as they directly interact with humans, at least two further links (apart from the intermediary with its technical capital) seem to be necessary. One will connect the technical intermediary with the data suppliers, while the other will relate this technical intermediary to the data receptors. Such two additional intermediaries must have a type of capital that is attractive both to the supplier/receptor and the technical intermediary. However, the fact that the field can be extremely complex and consists of a great number of situations, in which distinct capitals play a crucial role, may necessitate a number of proximate intermediaries with similar capital types so that the transaction between the distant supplier and receptor can take place and be successful.

Technical capital as a distinct form of capital

Given that the technical capital is especially pertinent to data treatment and processing, it is crucial competence for individuals who directly deal with the data in a professional way, by opening it, retrieving, reproducing, etc. What is less clear from this study is the value of introducing technical capital as a new type of capital into a field or situation. Perhaps technical capital is no more than a proxy for other established forms of capital. If, for example, one were to determine the qualifications, memberships and social status of the founders and/or directors of the intermediary organisations included in this study, it is conceivable that these intermediaries entered into a field not because of their technical capital but rather because of their cultural or social capital. In the same way, intermediaries may be using their economic, social, cultural or symbolic capital to connect with and attract actors with the requisite technical competences to enter a field of situation.

In effect, the transaction between those who own data assets and those who exhibit a deficit with regard to data is made possible, in the first instance, by an intermediary's cultural, social and/or symbolic capital, and only in the second instance by acquiring the technical skills required to connect the data asset with communities who do not possess the skills or resources (economic or symbolic) to do

These cases point to what we believe is an often overlooked and critical dimension in open data intermediation:

Intermediation does not only consist of a single agent facilitating the flow of data in an open data supply chain; multiple intermediaries may operate in an open data supply chain, and the presence of multiple intermediaries may increase the probability of use (and impact) because no single intermediary is likely to possess all the types of capital required to unlock the full value of the transaction between the provider and the user in each of the fields in play.

so themselves. In other words, after the means or social mechanism for transacting had been secured, the acquisition of technical skills follows.

Further research that explores the qualifications, memberships and social status of the founders and/or directors of open data intermediary organisations, and which attempts to determine whether these attributes, rather than their technical capacities, enabled them to enter the field and to play and intermediating role, could go some way to provide greater clarity on the extent to which technical capital is a distinctive and useful type of capital in explaining why intermediaries enter specific data ecosystems.

Invisible deficits and ethics

It is conceivable that at times the deficit of the end-user may be hidden or fabricated. In the case of Transparent Chennai the deficit on the part of government was not immediately apparent. Government was not attuned to a need for data to address the problems the city faced with regard to sanitation. And, neither was Transparent Chennai, initially aware of this data deficit. It was only through the process of engagement between Transparent Chennai and citizens around this particularly social challenge that the value of data became apparent, especially in the context of the city government, and that the intermediary role for Transparent Chennai in making such data available and usable became possible. In this case, the intermediary extends its role, not only in translating government data for use by citizens, but by ensuring that government is able to collect quality data and use it for its decision-making processes. Thus, the deficit may not only exist on the demand side, but even on the supply side.

This study did not find any examples of fabricated deficits in our cases. However, it is a common practice for the marketing divisions of commercial enterprises to create a perceived deficit. Think, for example, of the diet industry. While this study provides no evidence of fabricated deficits, the high levels of dependence of intermediaries on donor funding combined with a poor track-record of human-centred design as the data revolution unfolds (World Economic Forum 2015), should make us attuned to the possibility of open data interventions that presuppose particular types of user deficits.

The possibility of fabricated deficits draws attention to the extent to which the behaviour of intermediaries can be described as ethical. Again, this study did not explore the ethical implications of the actions of intermediaries in the cases under analysis. However, at the same time, we do not wish to create the impression that all intermediaries are virtuous, and that the interventions to link data supply with use are necessarily free from possible detrimental outcomes for users. Further research may explore the possible negative impacts of open data intermediation on certain actors in a supply chain.

Incentives and revenue models

There exists a large degree of homogeneity around incentives because most of the intermediaries in the study are NGOs/CSOs. Of the 32 number of intermediaries studied, 72% can be described as not-for-profit and, as a consequence, rely on donor funding to sustain their operations (see Tables 2 and 3). Only one of the intermediaries relies on public funds.

Table 2
Intermediaries by organisational types

Type (n=32)			
Gov	NGO	Firm	Other
3%	72%	13%	13%

Table 3:
Intermediaries by primary sources of revenue

Primary revenue source (n=32)			
Donor	Private	Public funds	Unknown
59%	16%	3%	22%

One intermediary stood out as having a strategy to generate own revenues related to its role as an open data intermediary. Mejabi et al. (2014:3) set out, among other things, "to identify the intermediaries in the flow of budget information between source and end-users and determine the sustainability of that role". The study found that the media professionals, civil society organisations and re-packagers … are the main intermediaries in the budget data flow in Nigeria. Included in the intermediaries identified was the NGO Budgit established in September 2011 with the main objective of monitoring and analysing the annual budget of Nigeria. In addition to its monitoring function, the organisation endeavours to create jobs for the youth. The organization is being funded by international organizations, development agencies and some individual donors but intended to produce infographics for corporate organisations as a way of sustaining its open data initiatives.

Incentives and revenue models were not the primary focus of this study. However, agenda-setting, access to funding and revenue models are highly relevant factors in ensuring the existence and functioning of open data intermediaries. Further, more in-depth research is required to link issues around funding and sustainable revenue generation to presence of intermediaries in specific fields.

Roles of open data intermediaries

The study conducted by the Jesuit Hakimani Centre identifies three intermediaries in the provision of

Of the 32 number of intermediaries studied,

72% can be described as not-for-profit and, as a consequence, rely on donor funding to sustain their operations

information to marginalised communities in Kenya: chief's offices, places of worship and community centres. The study provides data on how easy or difficult respondents from marginalised communities found it to obtain information related to government services via these intermediaries, and the various types of information sought.

The Jesuit Hakimani Centre study does not provide enough data to make any inferences on the nature of the transaction facilitated by the intermediaries. In particular, it is not clear where the intermediaries locate their data on government services, that is, whether the data is from the Kenyan government's open data portal (KODI) or from other (open) data sources. For this reason, it is not possible to say whether these are in fact open data intermediaries. And it makes it impossible to establish whether the

intermediaries are converting open data to information, or whether they are simply passing on existing information.

While it is not possible to say conclusively from the data available whether these intermediaries are using their capital to layer interpretation over government data or to provide access to existing information on government services, it is apparent that the marginalised communities in the study require information rather than data, and that they depend on intermediaries to provide such information.

In the cases from Nepal, all intermediaries were found to be converting government data (including open government data) into information. This is a pattern common to all of the intermediaries in the study who target citizens as their audience. Specific to the Nepalese cases is a focus on the conversion of data to formats other than those that are delivered via the internet. Due to low levels of internet penetration in Nepal, intermediaries need to deploy alternative, more traditional, forms of communication for open government data to reach citizens. It is interesting to note that in the of case Nepal, because of high levels of secrecy in government, the portal that contains essential Nepali government data sets is not run by the state but by a consortium of intermediaries. Here, intermediaries do not just facilitate provision of open data, but also conversion of open data to information into usable formats. In Nepal, intermediaries are consumers of open data, and they translate this into formats that can be understood by local communities.

6 IMPLICATIONS FOR POLICY

The practical implications of the findings presented here are not insignificant. Given that most of the open data intermediaries in this study were found to rely on donor in order to execute their open data-related social benefit activities, it is perhaps funders who should take heed of the findings presented here when making grants. For example, where a single agency is awarded a funding grant to improve the lives of citizens using open data, questions need to be asked whether the grantee possesses all the types of capital required not only to re-use open data but to connect open data to specific user groups in order to ensure the use and impact of open data. Questions to be asked of grantees could include: "Who are the specific user groups or communities that you expect to use the data, information or product you are making available?"; "Does your organisation have existing links to these user groups or communities?"; and "What types of channels are in place for you to communicate with these user groups or communities?". Alternatively donor funders may rethink awarding funding to single agencies in favour of funding partnerships or collaborations in which there is a greater spread of types of capital across multiple actors thereby increasing the likelihood of effectively linking the supply and use of open data. Such an approach would be more in line with an ecosystems approach to multiple actors being participants in the data supply and (re)use of open data, and the importance of keystone species and positive feedback loops to ensure a healthy system.

In addition to highlighting the importance of social capital in developing-country innovations systems, Intarakummerd and Chaoroenporn (2013) point to the importance of government initiating and coordinating the activities of both public and private intermediaries. Our findings indicate that should governments adopt such a co-ordinating role in the case of open data intermediaries, they would do well to

Where a single agency is awarded a funding grant, questions need to be asked whether the grantee possesses the type of capital required to connect open data to specific user groups.

engage with a broad spectrum of intermediaries, and not simply focus on intermediaries who possess only the technical capital required to interpret and repackage open government data. To be sure, this will be a challenging role for government to assume as conflicting vested interests are likely to surface. Although speculative, it is possible that such a coordinating role is likely to work best when there is a strong pact between all actors involved. And this, in turn, will require a common vision of the value and benefits of open data – something that cannot be taken for granted.

Should there be agreement on the value and benefits of open data, our findings show that most of the intermediaries in our study are NGOs that rely on donor funding. This should raise serious questions about the sustainability of open data initiatives that are civic-minded in conjunction with questions about what incentives other than that of donor funding could ensure the supply and use of open data beyond project funding. Funders and supporters of open data initiatives may have to think not only about the value and benefits or funding projects, but of the sustainability and the impacts of the products produced by the projects they fund.

7 CONCLUSION

The adaptation of Bourdieu's notion of habitus, field and, in particular, species of capital presented in this report in order to develop our understanding of how intermediaries link open data supply and use is not a panacea likely to model all the situations in which intermediaries are involved. Nevertheless, the theory of field, habitus and capital can provide a uniform framework for explaining certain characteristics of intermediaries and their agency. Furthermore, the approach may unveil traits previously imperceptible, and may predict the behaviours of intermediaries and their most likely impact in a data ecosystem.

Notwithstanding the limits of any framework seeking to reflect social reality combined with a reliance in this study on secondary data that did not always reveal the richness of data required to conduct more an in-depth analyses of open data intermediaries, the field, habitus and capital framework has revealed two valuable insights on open data intermediaries.

First is the value of different types of capital in connecting data supply and use, and the concomitant acknowledgment of the limits of an overreliance on technical capital in connecting users with open data.

Second is that intermediation does not only consist of a single agent facilitating the flow of data in an open data supply chain; multiple intermediaries may operate in an open data supply chain, and the presence of multiple intermediaries may increase the probability of use (and impact) because no single intermediary is likely to possess all the types of capital required to unlock the full value of the transaction between the provider and the user.

It is hoped that these two insights alone not only provide fertile ground for further research identified at various junctures in this report, but that they will make funders, policy-makers and advocates who work in the area of open data more attuned to the important contribution open data intermediaries have to make in ensuring the realisation of the oft-lauded benefits of open data.

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APPENDIX 1
MATRIX FOR COLLECTING DATA ON OPEN DATA INTERMEDIARIES

Agent$_{asset}$	**Name**	
	Type	Organisational form
	Asset	Describe what the A_a owns that A_d is in need of
Intermediary	**Name of intermediary**	
	URL	http://
	Intermediary organisational type	Individual / group / organisation [firm / government agency / NGO / etc.]
	Value provided by intermediary	Describe what value the intermediary provides to A_d by intermediating between A_a and A_d
	Type of capital provided by the intermediary to enable the transaction	Financial / cultural / social / symbolic / technical
	Revenue model	Describe how the intermediary funds the activity of intermediating between A_a and A_d
	Incentive	Why does the intermediary intermediate? What is the benefit of intermediation to the intermediary?
Agent$_{deficit}$	**Name**	
	Type	Organisational form
	Deficit	Describe what it is that A_d needs

APPENDIX 2
CASE STUDY DATA

AFRICA CASE STUDIES

Field: South African public university governance

Study: Open Data in the Governance of South African Public Universities

Agent_{asset}	**Name**	**Department for Higher Education and Training (DHET)**
	Type	National government department
	Asset	DHET collects data from all 23 South African public universities, and this data is stored in the Higher Education Management Information System (HEMIS)
Intermediary	**Name of open data intermediary**	**CS**
	URL	http://mi.nmmu.ac.za/Staff
	Intermediary organisational type	Individual
	Priority of intermediation	Peripheral business
	Frequency of intermediation	Annually
	Value provided by intermediary	Access: The intermediary has access to the DHET data because he has a contract with DHET for the regular consulting work done for the Department. Technical: The intermediary has the expertise to extract and interpret the data required from the HEMIS database, and to present it in a format required by Ad
	Type of capital provided by the intermediary to enable the transaction	Social capital and technical capital
	Revenue model	The intermediary charges Ad for his time in collecting, analysing and preparing the data
	Incentive	Financial: The intermediary benefits financially from his role as intermediary Professional: The intermediary strengthens his relationship with Ad by providing this service, thereby increasing the prospects of future consulting work
Agent_{deficit}	**Name**	**Centre for Higher Education Transformation (CHET)**
	Type	NGO
	Deficit	CHET requires data from HEMIS in a format that conforms with its performance indicators. CHET requires accurate data

	Name	CS
Agent_{asset}	Type	Individual
	Asset	Performance indicator data on South Africa's 23 public university.
Intermediary	Name of open data intermediary	Centre for Higher Education Transformation (CHET)
	URL	http://www.chet.org.za
	Intermediary organisational type	NGO
	Priority of intermediation	Core business
	Frequency of intermediation	Annually
	Value provided by intermediary	Information: The intermediary provides university planners and HES researchers with performance indicator data Access: The intermediary publishes selected open data from HEMIS
	Type of capital provided by the intermediary to enable the transaction	Economic capital (intermediary pays the Aa for providing the data) Symbolic capital: connects to university planners because of its reputation as a high-quality research organisation in the higher education field
	Revenue model	The intermediary is funded for its open data activities by donor agencies, particularly the US philanthropies
	Incentive	Reputational: By being the only publisher of open data on SA HE, the intermediary boosts its reputation as in impartial research NGO Financial: Renewed funding by establish a reputation among the donor community that CHET is both a dependable research NGO and that is consistently takes dissemination seriously
Agent_{deficit}	Name	University planners
	Type	Group (informal, un-organised collective)
	Deficit	As universities increasingly become market-driven and reliant on business intelligence for their strategic planning, they require accurate and reliable data for such planning and to present at the request of Council

Field: Kenyan government open data

Study: Understanding the Impacts of Kenya Open Data Applications and Services

	Name	Kenyan Open Data Initiative (KODI)
Agent_{asset}	Type	Government initiative
	Asset	400+ government datasets
Intermediary	Name of open data intermediary	Code4Kenya
	URL	http://www.code4kenya.org/
	Intermediary organisational type	**CSO**
	Priority of intermediation	**Core**
	Frequency of intermediation	**n/a**
	Value provided by intermediary	Provides skilled data journalists to media houses and CSOs to promote the use of open data in journalism and in civil society organisations
	Type of capital provided by the intermediary to enable the transaction	Technical capital
	Revenue model	Funded by donor and private funds
	Incentive	Professional: Reputational benefit in successfully increasing the use of open data via the media Civic: Social benefit in the form of a more informed citizenry making use of data to access government services Civic: Political benefit in the form of a more accountable government
Agent_{deficit}	Name	Media houses and CSOs
	Type	Firms / private companies
	Deficit	Lack of awareness and skills on using open data to generate news content and the development of civic applications by CSOs

Agent_{asset}	Name	Kenyan Open Data Initiative (KODI)
	Type	Government
	Asset	400+ government datasets
Intermediary	**Name of open data intermediary**	**Code4Kenya**
	URL	http://www.code4kenya.org/
	Intermediary organisational type	**CSO**
	Priority of intermediation	**Core**
	Frequency of intermediation	**n/a**
	Value provided by intermediary	Information: Promotes and supports the development of applications to increase the use and impact of government open data
	Type of capital provided by the intermediary to enable the transaction	Technical capital
	Revenue model	Funded by donor and private funds
	Incentive	Professional: Reputational benefit in successfully increasing the use of open data via its applications Civic: Social benefit in the form of a more informed citizenry making use of data to access government services Civic: Political benefit in the form of a more accountable government
Agent_{deficit}	**Name**	**Citizens**
	Type	Individual
	Deficit	Lack of awareness of government open data on public services such as education, health, water, etc. Lack of skills to interpret and use in a meaningful way government datasets on education, health, water, etc.

Agent_{asset}	Name	Kenyan Open Data Initiative (KODI)
	Type	Government
	Asset	400+ government datasets
Intermediary	**Name of open data intermediary**	**Tech developer cluster**
	URL	n/a
	Intermediary organisational type	**Individual**
	Value provided by intermediary	Information: The development of applications that convert data into information thereby allowing government to understand and interpret its own data
	Type of capital provided by the intermediary to enable the transaction	Technical capital
	Revenue model	n/a
	Incentive	Private: Reputational benefit in successfully increasing the use of open data via its applications, especially in the eyes of the international community Civic: Political benefit in the form of improved government accountability, efficiency and governance
Agent_{deficit}	**Name**	**Government ministries/departments**
	Type	Government
	Deficit	Lack of skills to interpret and use in a meaningful way government's own datasets

Study: Open Government Data for Effective Public Participation (Jesuit Hakimani Centre)

Agent_{asset}	Name	Kenyan Open Data Initiative (KODI)
	Type	Government
	Asset	400+ government datasets

Intermediary	Name of open data intermediary	**Chiefs' offices -- not an open data intermediary due lack of evidence of open data in the supply chain**
	URL	n/a
	Intermediary organisational type	**Community representative**
	Value provided by intermediary	Information: Provision of government information to marginalised communities to improve the quality of life for these communities
	Type of capital provided by the intermediary to enable the transaction	Unknown
	Revenue model	n/a
	Incentive	n/a

Agent_{deficit}	Name	**Marginalised communities (urban slums and rural settlements)**
	Type	Individuals
	Deficit	Lack of skills to interpret and use in a meaningful way government's open datasets Lack of access

Agent_{asset}	Name	**Kenyan Open Data Initiative (KODI)**
	Type	Government
	Asset	400+ government datasets

Intermediary	Name of open data intermediary	**Places of worship – not an open data intermediary due lack of evidence of open data in the supply chain**
	URL	n/a
	Intermediary organisational type	**Community representative**
	Value provided by intermediary	Information: Provision of government information to marginalised communities to improve the quality of life for these communities
	Type of capital provided by the intermediary to enable the transaction	Unknown
	Revenue model	n/a
	Incentive	n/a

Agent_{deficit}	Name	**Marginalised communities (urban slums and rural settlements)**
	Type	Individuals
	Deficit	Lack of skills to interpret and use in a meaningful way government's open datasets Lack of access

Agent_{asset}	Name	Kenyan Open Data Initiative (KODI)
	Type	Government
	Asset	400+ government datasets

Intermediary	Name of open data intermediary	Community centres -- not an open data intermediary due lack of evidence of open data in the supply chain
	URL	n/a
	Intermediary organisational type	Community representative
	Priority of intermediation	n/a
	Frequency of intermediation	n/a
	Value provided by intermediary	Information: Provision of government information to marginalised communities to improve the quality of life for these communities
	Type of capital provided by the intermediary to enable the transaction	Unknown
	Revenue model	n/a
	Incentive	n/a

Agent_{deficit}	Name	Marginalised communities (urban slums and rural settlements)
	Type	Individuals
	Deficit	Lack of skills to interpret and use in a meaningful way government's open datasets Lack of access

Field: Nigerian Federal Government Budget open data
Study: Investigation of the Use of Online National Budget of Nigeria (University of Ilorin)

Agent_{asset}	Name	Budget Office of the Federal Government of Nigeria
	Type	Government
	Asset	Budget data

Intermediary	Name of open data intermediary	Budgit
	URL	Yourbudgit.com
	Intermediary organisational type	NGO
	Priority of intermediation	Core
	Frequency of intermediation	Daily
	Value provided by intermediary	Information: Reinterpretation of complex budget for citizens Efficiency: Single access point for Nigerian budget data Economic: Job creation through data visualisation service Value added service: Interpretation and visualisation graphics on budget for private sector companies
	Type of capital provided by the intermediary to enable the transaction	Technical capital (citizens and private sector firms) Financial capital and technical capital (youth)
	Revenue model	Donor funding Selling infographics to the private sector
	Incentive	Civic: Improved governance by means of an informed and mobilised public Civic: Reduction in youth unemployment

Agent_{deficit}	Name	Citizens Youth Firms
	Type	Individuals
	Deficit	Citizens: Lack of skills to interpret and use in a meaningful way government's budget datasets Youth: Lack of income Firms: Lack of data in a form that is usable in a form that suits their needs (graphic visualisations)

Agent_{asset}	Name	Budget Office of the Federal Government of Nigeria
	Type	Government
	Asset	Budget data

	Name of open data intermediary	Connected Development
Intermediary	URL	www.connecteddevelopment.org
	Intermediary organisational type	NGO
	Priority of intermediation	Core
	Frequency of intermediation	Daily
	Value provided by intermediary	"CODE provides marginalized and vulnerable communities the resources to amplify their voice with integrity and independence, while providing them information that can bring about social and economic progress." Access: Provides access to information related to key development areas (health, education, etc.) Information: Reinterpretation of complex budget data for citizens
	Type of capital provided by the intermediary to enable the transaction	Technical capital
	Revenue model	Donor funding
	Incentive	Civic: Improved governance by means of an informed and mobilised marginalised communities Civic: Social development in Nigeria
Agent deficit	**Name**	**Marginalised and vulnerable communities in Nigeria**
	Type	Individuals
	Deficit	Lack of access to information on government services Lack of skills to interpret and use in a meaningful way government's budget datasets

ASIA CASE STUDIES

Field: Energy resource regulation

Study: Open government data for regulation of energy resources in India

Agent Asset	Name Type Asset	Department of Science and Technology National Government Agency Department of Science and Technology is responsible for policy-making and research-funding in the sector. The NDSAP Project Management Unit at National Informatics Centre is responsible for the implementation of the National Data Sharing Accessibility Policy (NDSAP) of the Government of India.
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	National Informatics Center http://www.nic.in/ Government agency – under the Department of Electronics and Information Center. Therefore not an intermediary outside government as this is still an agency of the government. NIC accepts data submitted to the open government data platform by various government agencies, assigns personnel to sit with these agencies and help them to share data, undertakes required cleaning and formatting, and publishes them on the open government data platform. Technical capital Cultural capital n/a n/a
Agent Deficit	Name Type Deficit	Other Government Institutions Government Technical

Agent$_{Asset}$	Name Type Asset	Varied Agencies mainly Government Government and other sources Data collected from different ministries and departments including data from other countries and International Organizations
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Indianpetro** n/a Firm Information: collects, reports data from the energy and infrastructure sector Networking: organizes conferences on key energy sector related issues providing forum for networking for key industry players Technical Capital: Reinterpretation of the data collected Funded private funds Professional: Reputational benefit and financial rewards from the sales of the data published Civic: Political benefit in the form of a more accountable and transparent government
Agent$_{Deficit}$	Name Type Deficit	Citizens and business that need the data provided Individual/organizational Lack the technical knowledge to interpret data Lack free access since some of the data collected by intermediaries are available for a fee Many of the data collected by the Government of India are incomplete due to late submissions by the agencies and the private businesses. There is also a report of data being repetitive

Field: Donor aid and budget data in Nepal

Study: Open Aid and Budget data in Nepal

Agent$_{Asset}$	Name Type Asset	Government of Nepal Government Data from its departments
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Journalists/Reporters** n/a Mass Media (Freelance) Information: reports the data collected to the public Technical: Interprets the data in order for public to understand its relevance. There is a need for journalists to acquire expertise and technical know-how in the interpretation of the data. Furthermore, journalists should report about the data and not a pre-made story where they only search data to supply the needed information in their story Funded by private funds Professional and Civic benefits in the form of a well-informed citizens and an accountable government
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data The Public Service Act promoted a culture of secrecy among government employees and became a tool of convenience not to follow RTI Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Collects data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Open Nepal** n/a Collaborative group of Freedom Forum, NGO Federation of Nepal, Young Innovations and Development Initiative Information: through the Open Data Portal provide data that are readily accessible by the public Capacity Development: provide tools and capacities to analyse data and engage with open data. Raises awareness on open data. Technical: analyses and interprets data for easy understanding and access Financial: funds many programmes for capacity building for open data Donor funded Professional: Reputational Civic: capacitated and informed citizens. Government is more accountable and transparent
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lacks technical knowledge to interpret and analyze data Lacks technology

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Collects data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Freedom Forum** n/a NGO Information: researches and reports on data especially on human rights, RTI, freedom of expression, press freedom, among others Capacity Building: provides workshops on open data scoping Technical Donor funded Professional: reputational Civic: more informed citizens who engage with open data. Government is more accountable and transparent
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Collects data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**NGO Federation of Nepal** n/a NGO Information: does research and case studies on open data Capacity- building: hosts open data scoping workshops Technical Donor funded Professional: Reputational Civic: more informed and capacitated citizens Political benefit in the form of a more accountable and transparent government
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Young Innovations** n/a Private company Provides innovative solutions in the areas of open development, integrated mobile solutions and web development Capacity Building: provides workshops on open data and opened up data on the Open Data Portal. A partner in the Open Nepal Initiative Technical & Social Private funds Professional: Reputational
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Open Knowledge Foundation Nepal** n/a Non-profit network Information: share knowledge and data Capacity Building: provides training to unlock information Hosts regular open data hacking meet-ups and has made the budget data open through their Open Spending Nepal website Technical & Social: trains and shares knowledge n/a Professional: Reputational Civic: more informed and capacitated citizens More accountable and transparent government
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Kathmandu Living Labs** n/a CSO Harnesses local knowledge, leverage open data, promote civic technology focusing on participatory technologies that empower and engage citizens in working with government and development agencies Technical & Social: provides technology and allows citizens, government and other organizations to interact and address problems collectively n/a Professional: reputational Civic: a more empowered citizenry and a more accountable government
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5%have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Development Initiatives** n/a International Organization Information: provides data on poverty and resource flows. A partner in the Open Nepal initiative. Technical: makes data available and accessible and useable. n/a Professional: Reputational Civic: reduced poverty, more informed citizenry and engaged and accountable government
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Development Gateway** n/a Non-profit Organization Information: provides finance data to other organizations Services for international development such as Aid Management platform, AidData initiative. Technical: provides finance data n/a Professional: Reputational Civic: Aids in International Development
Agent$_{Deficit}$	Name Type Deficit	Nepali Organizations Various Lack of consolidated and reliable source of financial data

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**World Bank Institute** n/a International Organization Information: collected and mapped up local development data. Capacity Building: coordinated two Data Boot camps in Kathmandu aimed at improving the use of open data by journalists, civil society actors, and technologists. Technical: collects and interprets data, trains on open data Social: allows interaction n/a Professional: Reputation is build Civic: helps reduce poverty incidence, capacitates citizens. Makes government accountable and transparent
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Agent$_{Asset}$	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Restless Development** n/a CSO-youth led development agency Information & Capacity Building: Big Idea initiative – working to improve skills of young people to monitor post-2015 settlement using open data Technical Social: access to youth n/a Professional: Reputation as a youth-led initiative Civic: improved skills of youth and government that is accountable
Agent$_{Deficit}$	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only five percent have access to a trustworthy internet connection.

Agent_{Asset}	Name Type Asset	Nepal Government Government Data from national government and local government through the Village Development Committees, among others
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Global Facility for Disaster Reduction and Recovery** https://www.gfdrr.org/region/South%20Asia-- Partnership Information: through the Open Data for Resilience Initiative piloting in Nepal aims to support evidence-based innovative solutions to urban issues across South Asia by creating multi-hazard risk data that is open and accessible to the public. Technical n/a Professional: Reputational Civic: More engaged and capacitated citizens with a more accountable government
Agent_{Deficit}	Name Type Deficit	Citizens Individual Lack expertise to interpret data Lack the technology to access data because Nepal's internet service uses weak internet service. As per study, 31% of Nepalis have access to some form of internet connection and only 5% have access to a trustworthy internet connection.

Field: Finance and budget data in Indonesia

Study: Open Data Initiative of Ministry of Finance on National budget Transparency in Indonesia

Agent_{Asset}	Name Type Asset	Ministry of Finance in Indonesia National Government Collects and collates data on budget and finance in the Government of Indonesia
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Indonesia Corruption Watch** n/a NGO Information: this NGO is actively working against corruption and produces data on budget, among others Advocate: analyze data especially on corruption cases and even personally discusses with their sources to understand the meaning of the data Technical: provides an analysis of data collected Social: interaction is encouraged Donor funded Professional: reputational Civic: a well-informed citizenry that works against corruption. A government that is accountable and transparent
Agent_{Deficit}	Name Type Deficit	Citizens Individual Lacks technical expertise to interpret data

Agent_{Asset}	Name Type Asset	Ministry of Finance in Indonesia National Government Data on budget and finance in the Government of Indonesia
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Forum Indonesia Untuk Trannsparansi Anggaran (FITRA)** n/a NGO Information: collects and analyzes data for the public on all budget information that they generate either from government websites or from formal requests. Technical: analyzes data Donor funded Professional: Reputational Civic: a well-informed citizens on matters of national budget. A government that is accountable and transparent
Agent_{Deficit}	Name Type Deficit	Citizens Individual Lacks technical expertise to analyze data Lacks personal relationships in sources to acquire information that are not readily available online

Field: Government open data in India

Study: Opening Government Data through Mediation: Exploring the Roles, Practices and Strategies of Data Intermediary Organisations in India

Agent_{Asset}	Name Type Asset	Various Sources including Government of India Non-Commercial Sources Government/Buiseness/Private Collects data on their agencies and transactions.
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**DataMeet** http://datameet.org/ NGO Information on government produced data and data from non-commercial organizations DataMeet directly shares data through its mailing list and GitHub, and not only information about data. Technical: provides a space for sharing knowledge and practices of working with mostly government produced data. In many cases DataMeet volunteers scrape and clean up data, and share the sanitised and reorganised data. Social: It also liaises with the NIC in terms of bettering quality and standards of data hosted at the open government data platform. It also creates an extra-institutional network. Collaboration Increased use of open data "This includes looking at how to make data open so that it's potential to create more accountability and transparency to improve policies and implementation of projects across industry, citizen sector organizations, and governance."
Agent_{Deficit}	Name Type Deficit	Open data community Individual/organizational Lack resources Lack understanding of open data community Lack sources of open data, and information regarding how to clean/reorganise existing data

*Agent*_{Asset}	Name Type Asset	Government of India Government Mix of Government data mostly, and data collected directly by Accountability Initiative
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Accountability Initiative** http://accountabilityindia.org/ CSO Information and networking Capacity building Government accountability Technical capital: collects and interprets government data Cultural capital: able to use cultural capital to make successful RTI requests from government. From the website: "The data has been collected through surveys and government owned data bases such as SSA portal, MIS systems and district budget documents. In addition, Right to Information applications were filed to secure access to information under the control of public authorities. All data sets have been sourced." Donor funded Professional and Civic by bring together different actors in open data and making government more accountable
*Agent*_{Deficit}	Name Type Deficit	Citizens and other organizations Individual/Organizational Lack access and technical knowledge in interpreting data

Agent_{Asset}	Name Type Asset	Various sources including government and non-government agencies n/a Consolidated raw data on primary school education in the region + platform + visualization tools
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	**Karnataka Learning Partnership** http://klp.org.in/ NGO Information: re-shares data in various kinds of data products including online map-based data browsing interface Technical Acknowledges limited social capital as a provider of a data platform: "The programme data and the Share-Your-Story component ... in its current form, excludes the majority of our intended target audience – the parents of children who go to government preschools and primary schools who are mostly illiterate and do not have online access due to lack of electricity, computers, computer educators, Internet connections, local-language content etc." Donor funded Professional: reputation as leader in Open data in India Civic: well-informed and empowered citizens and organizations. Accountable and transparent government

Agent1_{Deficit}	Name	Citizens
	Type	Individual
	Deficit	Lack access to data, expertise in interpreting and using data
Agent2_{Deficit}	Name	Educational and other civic organizations
	Type	CSOs
	Deficit	Lack access to consolidated data, expertise in interpreting and using data

Agent_{Asset}	Name	Government of India. Also data collected from academics, NGOs and citizens.
	Type	Mixed
	Asset	Water-related data
Intermediary	Name of Open Data Intermediary	**India Water Portal, which is run by Arghyam**
	URL 1	http://www.arghyam.org
	URL 2	http://indiawaterportal.org/
	Intermediary Organisational type	NGO
	Value Provided by Intermediary	Information on water and sanitation related issues. "The Data Project aims to understand what water data exists, and strives to create a diverse and vibrant community that will use this data to enhance projects, advocacy, and impact in the water sector in India." India Water Portal works primarily through partnerships with non-profit organisations, CSR divisions of multinational corporations and the media. We also work with volunteers from a wide range of backgrounds, disciplines and locations, who contribute their valuable time and energy to the cause of spreading awareness on and sharing solutions for India's water problems.
	Type of capital provided by the intermediary to enable the transaction	Technical
	Revenue Model	Donor funded
	Incentive	Professional: Reputation is build. Civic: Well-informed citizens. Accountable government.
Agent_{Deficit}	Name	Citizens
	Type	Individual
	Deficit	Lacks access to data on water and sanitation

Agent_{Asset}	Name	Election Commission of India
	Type	National government
	Asset	Collects data on social, economic and criminal records, among others submitted by political candidates
Intermediary	Name of Open Data Intermediary	**Association of Democratic Reforms (ADR)**
	URL	http://adrindia.org/
	Intermediary Organisational type	NGO
	Value Provided by Intermediary	ADR liberates data by turning scanned PDFs into machine-readable data (about electoral candidates).
	Type of capital provided by the intermediary to enable the transaction	Technical
	Revenue Model	Donor funded
	Incentive	Professional: reputational Civic: well-informed citizens for better decision-making especially in choosing their elected officials. Government that is transparent and accountable
Agent1_{Deficit}	Name	Citizens
	Type	Individual
	Deficit	Lacks access to data
Agent2_{Deficit}	Name	Media
	Type	Company
	Deficit	Lacks machine-readable data, and hence lacks ability to compare between electoral candidates.

Agent$_{Asset}$	Name	Data submitted by various non-governmental organisations, academics, individuals, and private organisations
	Type	Mixed
	Asset	Data on environment from agencies, specifically data on biodiversity
Intermediary	Name of Open Data Intermediary	**India Biodiversity Portal, which is created and managed by Strand Life Sciences and ATREE**
	URL 1	http://indiabiodiversity.org/
	URL 2	http://www.strandls.com /
	URL 3	http://www.atree.org
	Intermediary Organisational type	NGO
	Value Provided by Intermediary	Information on environmental issues. "The portal is intended as a public participatory effort. The Project has been endorsed by the National Knowledge Commission, the Government of India, to promote decentralization, transparency, the right to information and participatory action with respect to biodiversity conservation and utilization. It has been conceived in the public domain and will solicit broad-based participation from civil society, government, research institutions and conservation NGOs to consolidate and augment existing biodiversity information and make it readily accessible to all stakeholders."
		Technical interpretation of data for easy understanding; extensive use of mapping technology to achieve this.
		Social: interaction among partner organizations and individuals
		IBP is the only publicly available source of biodiversity data in India. Their key contribution is in terms of providing a platform for the biodiversity data to be submitted and accessed.
	Type of capital provided by the intermediary to enable the transaction	Technical
	Revenue Model	Donor funded. Also, funded by the partner organisations, especially Strand Life Sciences.
	Incentive	Professional: reputational
		Civic: well-informed citizens especially on matters of the environment
		Government is accountable and transparent
Agent$_{Deficit}$	Name	Citizens/environmentalists
	Type	Individuals or CSOs
	Deficit	Lack access to data and technical knowledge to interpret data
		Lack data in general, as IBP is the only source for open biodiversity data.

Agent$_{Asset}$	Name	Annual budget and expenditure data published by central and state governments in India.
	Type	Government
	Asset	Budget data
Intermediary	Name of Open Data Intermediary	**Centre for Budget and Governance Accountability**
	URL	www.cbgaindia.org/
	Intermediary Organisational type	NGO
	Value Provided by Intermediary	Information particularly on budget and finance matters
	Type of capital provided by the intermediary to enable the transaction	Technical: interprets data. Also visualises and communicates data, and informs actions of budget activist groups.
	Revenue Model	Donor funding
	Incentive	Professional: reputation is build
		Civic: well-informed citizens.
		Accountable and transparent government
Agent$_{Deficit}$	Name	Citizens
	Type	Individual
	Deficit	Lacks access to data and skills to interpret data

Agent$_{Asset}$	Name	Government sources. More specifically data published by the central government of India regarding parliamentary and legislative activities of the Members of Parliament.
	Type	Government
	Asset	Data on legislation
Intermediary	Name of Open Data Intermediary	**PRS Legislative Research**
	URL	http://prsindia.org/
	Intermediary Organisational type	NGO
	Value Provided by Intermediary	Information. Also putting data together in a machine-readable format.PRS tracks the functioning of the Indian Parliament and works with MPs from the Lok Sabha and Rajya Sabha across political parties and MLAs from various states. PRS provides a comprehensive and credible resource base to access Parliament-specific data, background information on Parliamentary and governance processes and analysis of key legislative and policy issues.
	Type of capital provided by the intermediary to enable the transaction	Technical
	Revenue Model	Donor funding
	Incentive	Professional: reputation is build
		Civic: well-informed citizens And accountable government
Agent1$_{Deficit}$	Name	Citizens
	Type	Individuals
	Deficit	Lack of access to data

Agent2$_{Deficit}$	Name Type Deficit	Media Private companies Lack of access to data

Field: Chennai City data

Study: The Quality of Civic Data in India and the Implications on the Push for Open Data

Agent$_{Asset}$	Name Type Asset	Corporation of Chennai Government Administrative data
Intermediary	Name of Open Data Intermediary URL Intermediary Organisational type Value Provided by Intermediary	**Transparent Chennai** http://www.transparentchennai.com CSO Information on government data collected Capacity building -Transparent Chennai not only reports data collected but adds value to it including how to use data shared. Transparent Chennai helps citizen groups to gather data, and use the primary data and government data for advocating their causes. Transparent Chennai aggregates, creates and disseminates data and research about important civic issues facing Chennai, including those issues facing the poor. It aims to empower residents by providing them useful, easy-to-understand information that can better highlight citizen needs, shed light on government performance, and improve their lives in the city, one issue at a time. Its goal is to enable residents, especially the poor, to have a greater voice in planning and city governance. Transparent Chennai believes that a lack of data has sometimes allowed for government to evade its responsibilities to provide basic entitlements to all city residents, and to exercise force with impunity over informal settlements and workers. Transparent Chennai works closely with individuals and citizens' groups to create data that can help them counter inaccurate or incomplete government data, and make better claims on the government for their rights and entitlements.
	Type of capital provided by the intermediary to enable the transaction Revenue Model Incentive	Technical: collection and analysis of city data Social: access to city officials & access to citizens Donor funded Professional: reputational Civic: well informed and empowered citizens, Government more accountable and transparent
Agent1$_{Deficit}$	Name Type Deficit	Corporation of Chennai Government They generally do not have access to their own data, nor were they aware of the value of their own data in solving some of the social issues facing the city
Agent2$_{Deficit}$	Name Type Deficit	Citizens Individual Lack access to and the relationship to access data Lack knowledge to interpret data

INTERMEDIARIES DATA TABLE: CAPITAL, TYPE & PRIMARY REVENUE SOURCE

Intermediary	Capital					Type				Primary revenue source			
	Economic	Cultural	Social	Symbolic	Technical	Gov	NGO	Firm	Other	Donor	Private	Public funds	Unknown
ASIA 27													
National Informatics Centre					1	1						1	
Indian Petro		1			1			1			1		
Infraline					1			1			1		
Datanet					1			1			1		
Freelance media in India					1				1		1		
Open Nepal	1				1				1	1			
Freedom Forum					1		1			1			
NGO Federation Nepal					1		1			1			
Young Innovations			1		1			1			1		
Open Knowledge Foundation Nepal			1		1		1			1			
Kathmandu Living Labs			1		1		1						1
Development Initiatives					1		1						1
Development Gateway					1		1						1
World Bank Institute			1		1		1						1
Restless Development			1		1		1						1
Global Facility for Disaster Reduction and Recovery			1		1				1				1
Indonesia Corruption Watch					1		1			1			
FITRA					1		1			1			
DataMeet			1		1		1						1
Accountability Initiative		1			1		1			1			
Karnataka Learning Initiative					1		1			1			
Arghyam					1		1			1			
ADR					1		1			1			
India Biodiversity Portal			1		1		1			1			
Centre for Budget and Governance Accountability					1		1			1			
PRS Legislative Research					1		1			1			
Transparent Chennai			1		1		1			1			
AFRICA 5													
CS	1		1		1				1	1			
CHET				1			1			1			
Code4Kenya					1		1			1			
Budgit	1				1		1			1			
Connected Development					1		1			1			
32	3	2	10	1	31	1	23	4	4	19	5	1	7