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Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

What Shall We Expect from Big Data in Public Administration?

An Investigation in a Community of Public Service Innovators in Italy

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During the last years, Big Data attracted considerable attention as a potential source of innovation in public administration. What role Big Data can play in the redefinition of public services, however, has not been clarified yet. This study aims to investigate the views on the use of Big Data in public administration held within a particular policy community of innovators in public administration in Italy. Using Q methodology, the analysis shows three distinctive views on this topic, that can be understood as bearing a "pragmatist", "sceptical", and "cautious" stance, respectively. The results of this study suggest that the emergence of Big Data triggers reactionary positions within the policy community of innovators, but it also stimulates some ways to consider how to introduce and experiment with the new source of technological change.

Keywords: Innovation, Big Data, public administration, Q methodology

1   Introduction

During the last decades, innovation gained a prominent status within the discourse on public governance and the delivery of public services (Osborne and Brown, 2011; Borins, 2014). Innovation is considered an important tool to attain improvements in the provision of public services, in such terms as enhanced quality of service delivery and increased responsiveness to the needs and aspirations of citizens and users (Moore and Hartley, 2008). Over time, various studies have been done in order to clarify the origins, diffusion, and effects of innovation on the delivery of public services (Albury, 2005; Borins, 1998; Hartley, 2005; Moore, 2005; Moore and Hartley, 2008; Mulgan and Albury, 2003; Osborne, 1998; Osborne and Gaebler, 1993). Yet, relatively little research has been conducted in order to clarify what happens when a new technology provides sources of potential innovations. How do civil servants make sense of the new technology in order to form expectations about its possible uses?

The emergence of new technologies can potentially disrupt the present understanding of work practices in public sector organisations. The literature of socio-technical systems (Geels, 2004, 2005), for example, pays attention to the adaptations to technological change that take the form of innovation in the conduct of social interactions. The present study is specifically focused on the interpretation of new technologies from the side of civil servants. The theoretical argument that underpins this research interest is that the effects of new technologies on work practices is mediated by individuals' understanding of what the new technology means, how it relates to existing technologies and how it can potentially redefine work practices. The analysis of how individuals understand a new technology, therefore, is important in order to provide better explanations of the process of adaptation to technological change.

This study is specifically focused on the emergence of so-called Big Data and their impact on the domain of public administration. The digital administration of the public sector is a complex inter-organizational system populated by public authorities and private actors (e.g., software

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

houses, consulting firms, and telecom companies), that typically collaborate in collecting, storing, sharing, and analysing data for both public and private purposes. Public administration is typically exposed to a persistent flow of sources of technological change (e.g., increase of speed of Internet connection, advances in cryptography, adoption of standard protocols for data sharing, etc.). They contribute reshaping patterns of inter-organizational relationships and institutional arrangements. Big Data provide a contemporary exemplar of such sources of change. Big Data are data sets formed through the recording and storage of traces of various acts performed by individuals over time. Examples include financial transactions, social media traffic, health records, and GPS coordinates, often by means of mobile tools (Manyika *et al.*, 2011). Big Data are expected to provide enormous opportunities for designing and delivering more efficient and effective public policies (Bollier, 2010; Boyd and Crawford, 2012; Manovich, 2011). Opportunities include detecting early signs of emerging trends (e.g., disease spread), monitoring social behaviour (e.g., response to emergency), measuring behavioural or economic impact of policy measures (e.g., traffic congestions or credit card expenses), picking the "sentiment" of communities (e.g., mainstream micro-blogging topics and crowd-sourcing), and anticipating future behaviour (e.g., predictive policing). By means of advanced statistical and computational techniques, public sector analysts may unveil patterns and anomalies within these large socio-economic data sets that may not be ordinarily evident on the basis of "conventional" information channels, such as national census.

The rest of this study is organised as follows. Next section provides a review of the literature on Big Data in public administration. Section 3 outlines the research method of this study. Section 4 illustrates the results. Finally, section 5 draws the conclusions.

2 Big Data in public administration: a literature review

The role of technological change in public administration has been highlighted in several studies (Dunleavy *et al.*, 2005; Hood and Margetts, 2007; Marche and McNiven, 2003; Margetts, 2009; Moon, 2002; Osborne and Brown, 2011). As a particular source of technological change, however, Big Data pose special prospects and issues. The emergence of these datasets and analytical capabilities calls for a reconsideration of the role of the government within the system of public value creation, especially in relation to the use of governments' tools (i.e., nodality, authority, treasure, and organizational capacity) for orchestrating the exploitation of Big Data for designing, implementing, and evaluating public policies. In addition, questions arise with respect to who owns and controls Big Data, who supplies the information contained in Big Data and why they produce it, who demands the information hosted in Big Data and why they ask for it, and what strategy should governments follow to actively engage business companies and the civil society for making use of Big Data for public purposes.

As both a technological and social phenomenon, Big Data have been variously defined. A common thread describes them as those data that cannot be analysed using traditional processes or tools (Eaton *et al.*, 2012; Manyika *et al.*, 2011; Marzetta, 2012). According to a more refined definition, Big Data are the production and analysis of data that are characterised by large volume, rapid velocity (i.e., real-time or nearly real-time information), and sheer variety (i.e., formats that include text messages, images, readings from sensors, GPS signals, and more, and that originate from laptops, smart phones, tablets, and other devices), that require new forms of processing to enable enhanced decision making, insight discovery and process optimisation (Beyer and Laney, 2012; McAfee and Brynjolfsson, 2012). Others, instead, highlight that the distinctive feature of Big Data relates to its content focused on people's behaviour rather than on their beliefs (Edge, 2012).

Since the late 2000's, the emergence of Big Data triggered a lively debate around the opportunities and issues posed by this technology in various domains, including public administration. Some authors highlighted that Big Data allow to create value through

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

sophisticated data analysis (Kiron and Schockley, 2012; LaValle *et al.*, 2011) and to make policy-making more agile and effective (Global Pulse, 2012). Big Data seems to hold the promise of various process and service innovations in the delivery of public services in areas such as predictive policing, fraud detection, tax collection, fraud detection, weather, epidemiology and healthcare, scientific research, transport, and education. However, evidence that Big Data can impact onto social practices in radical way, and in the public sector in particular, is relatively thin so far. Early applications of Big Data in the public sector included, for instance, predictive policing implemented in the US (Los Angeles and Santa Cruz, California; Ferguson, 2013; Greengard, 2012) and the UK (Kent Police; Asquer, 2014), fraud detection in Australia (Centrelink; Milakovich, 2012), and school performance in the US (Atlanta; LaValle *et al.*, 2011). Future developments may include systems for tracking policy implementation, monitoring social trends and unveiling unexposed social patterns, and assisting policy-makers and regulators through systems that provide early warnings, real-time awareness, and real-time feedback about policy interventions (Global Pulse, 2012).

Other works, on the other hand, highlighted that Big Data also pose several issues. Big Data are produced and stored in multiple organisations of both the public and the private sector, such as banks, insurance firms, telephone corporations, and Internet companies (especially social networks and search engines) (UN, 2012). Access to these resources enables to perform various sorts of computations that may result in valuable information, but that also pose the threat of misuse, manipulation, infringement of privacy, and even intrusion into individual freedom (Bollier, 2010; Boyd and Crawford, 2012). Manovich (2011) warned that the rise of Big Data is accompanied by the creation of two classes – namely, those who have the means to collect them and those who have the expertise to analyse them – that could potentially exploit a third one made of those who just create them (both consciously and unintentionally, especially by leaving "digital footprints" behind).

On the whole, Big Data carry mixed utopian and dystopian connotations. Some authors highlighted that Big Data could allow resourceful actors to circumvent existing regulatory systems and policies (Milakovich, 2012). Others argued that Big Data opens up plenty of scope for improving public services (Foresight Future Identities, 2013), especially if organisations collaborate to share their data base and make them available to the public (i.e., "data philanthropy"; Kirkpatrick, 2013) and if the governments act as "catalysts" for value-creation initiatives (World Economic Forum, 2012). Others pointed out that, like other experiences of ICT tools in the public sector (Cordella and Iannacci, 2010; Dazinger and Anderesen, 2002; Moon, 2002), Big Data may deliver modest results, if they are not accompanied by the supply of adequately trained staff, incentives for innovators, updated infrastructure, and communication strategies intended to tackle sources of public concerns with safety, security, and privacy. The public and policy discourse around Big Data, then, contains ideas that, in part at least, call for the design of novel organisational and institutional arrangements that help regulating the collection, storage, sharing, analysis, and use of Big Data, from the side of both public and private actors.

3   Research Method

This paper aims to investigate the formation of ideas about a source of technological change – namely, Big Data – in the governance practices and regime of a particular domain – namely, public administration. The research question of this study is how the role of Big Data is understood by the policy community focused on the use of information and communication technology (ICT) in public administration. The exploratory nature of the research question calls for the adoption of a research method that enables the analysis of qualitative data in a rigorous way. The present study employs Q methodology (Stephenson, 1953; Brown, 1980) for identifying the different viewpoints that practitioners of ICT in public administration hold about the role of Big Data. Q methodology (a variant of factor analysis that was developed in the field of psychology in the

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

1930s) consists of the analysis of ideas (understood as beliefs and preferences of individuals as expressed in natural language) that a group of individuals hold on the topic of interest. In part, Q methodology follows a quantitative approach to the analysis of individuals' view. In part, it is also consonant with a qualitative perspective because of the processing of natural language information in the arrangement of data collection and in the interpretation of the results.

Q methodology requires that each participant of a population sample (the so-called P sample) sorts a series of statements (the so-called Q sample) that are considered illustrative of the breadth of the discourse around a topic or issue (the so-called 'concourse') (Brown, 2004; Dryzek and Berejikian, 1993). In the present study, the Q sample was constructed on both empirical and theoretical ground. Sentences about Big Data, the expected role of Big Data, and policy positions about the regulation of Big Data were collected from various published works and media sources (referenced in previous section). Then, sentences were arranged and synthesised around four categories formulated in relation to general views about technology in the public sector (Margetts and Dunleavy, 2002; Schwarz and Thompson, 1990), namely the "technology benign" (i.e., technology is forgiving and any disruptive force will be accommodated), "technology ephemeral" (i.e., technology is uncompromising and any innovation will lead to radical shifts), "technology perverse or tolerant" (i.e., technology is resilient but also vulnerable to shocks), and "technology" capricious" (i.e., technology is haphazard and it will expand towards unforeseen directions). These four categories are theoretically derived from the variety of culture views on public administration (namely individualist, hierarchist, egalitarian, and fatalist ones) (Hood, 1998; Douglas, 1982). The resulting Q sample consisted of 24 statements.

The P sample was purposively selected from an instance of a policy community organised around the use of ICT in public administration. P samples are typically constructed on 'naturalistic' or demographic criteria with the aim of "capturing" enough variety of views on the given topic or issue (Jeffares and Skelcher, 2011). The selection of the respondents, therefore, is carried out with the explicit intention to elicit as much variety of views on the role of Big Data in public administration as possible, rather than to infer average tendencies within the ICT policy community. The P sample of this study consisted of 28 individuals that were selected from members of the "Open Data" group of the "Innovatori PA" (Innovators of Public Administration), a social network of public employees and public sector consultants promoted by Formez (a training agency for the public sector owned by the Italian Government) in Italy. Participants to the P sample included individuals from the national, regional and municipal administrations, including public services such as health and schools.

The collection of data took place online (through FlashQ software; Hackert and Braehler, 2007) in the period May-June 2015 through 15 respondents (54% return rate), who aged 46 on average (median 45) and possessed 17 years of experience in ICT in public administration on average (median 16). Respondents were invited to sort the statements of the Q sample in a pyramid-shaped 'grid' where statements were allocated along a scale with values ranging from -4 to +4. The responses (the so-called Q sorts) were analysed through a by-person factor analysis to reveal correlated groups of statement preferences. The results of the analysis took the form of synthesised factors, that is, of alternative 'views' on the role of Big Data in ICT in the public sector that originated from close correlations between the different Q-sorts of the respondents (Yanow and Schwatz-Shea, 2006; Mathur and Skelcher, 2007).

4   Analysing Ideas about the role of Big Data

The first stage of this study consisted of the collection of ideas on the use of Big Data in public administration through the literature review of this topic, that is illustrated in section 2. Ideas on the use of Big Data in public administration were conveniently synthesised and arranged into the four categories that related to alternative views of technology or cultural values (individualist, hierarchist, egalitarian, and fatalist). The resulting Q sample is illustrated in Table 1.

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

Table 1. The Q sample

"Technology benign" Individualistic culture	"Technology perverse or tolerant" Hierarchical culture	"Technology ephemeral" Egalitarian culture	"Technology capricious" Fatalist culture
Public administration will be able to optimise on the opportunities offered by Big Data.	Public administration will experiment to find how Big Data work for them.	Big Data will not significantly affect public administration.	Public administration will be unpredictably affected by embracing Big Data.
Public administration should not be afraid to allow trials and errors when adopting Big Data.	Public administration should not loosen its tight regulatory and control systems while adopting Big Data.	Public administration should be concerned that Big Data are not just a matter under the domain of IT specialists.	Public administration should bear in mind that Big Data do not necessarily imply better service quality.
Big Data initiatives can be stimulated by the competition between public sector agencies or departments to stay at the forefront of technological development.	Big Data initiatives in public administration should be centrally coordinated by governmental authorities.	Big Data offer opportunities to better reach all users of public services and tailor services to their needs.	Big Data may prove just next technological fad and miss delivering efficient or effective solutions.
Big Data initiatives in public administration can succeed if they show how they can solve individual practical tasks.	Big Data initiatives in public administration should be adopted by following formal and explicit guidelines.	Big Data may pose some threats to existing public sector organizational systems and routines, and to some public employees' skills and know-how.	Big Data may pose some threats to security and consistency of public sector activities.
Big Data initiatives in public administration will be adopted if there are adequate individual incentives for doing so.	Big Data are a serious challenge for the regulation of public administration and should not be easily overlooked.	Big Data need to gain the trust of citizens before they are successfully adopted in public administration.	Big Data in public administration may be a tool in the hands of the elite for the control of the communities.
The introduction of Big Data in public administration will be hampered by consideration for the sunk cost of existing IT infrastructure.	The introduction of Big Data in public administration will call for greater regulation of the Internet in general.	The introduction of Big Data in public administration will exclude or marginalise everything that is not digitalised.	The introduction of Big Data in public administration will strengthen governmental tools of social control of the masses.

After data collection, the Q-sorts from the respondents were analysed through a principal component analysis followed by varimax and then judgemental rotation to account for as many of the sorts as possible in as few factors as possible (Stricklin and Almeida, 2001). The aim of the analysis was to 'extract' distinctive 'model views' on the role of Big Data in public administration that could conveniently summarise the variety of ideas held by the respondents. The analysis was conducted using PQMethod software (Schmolck, 2012). At the end of the analysis, three factors were selected because they had two or more people (Q-sorts) loading significantly on each factor (Watts and Stenner, 2005). The three factors explained 61% variance in total. The three factors resulted theoretically informative as they related to meaningful alternative viewpoints of Big Data in public administration. Only one response from one person did not significantly load to any factor, possibly because of being an outlier or because of holding unresolved views on the topic. Table 2 shows the factor matrix with defining sorts, which illustrates to which of the three selected factors ('viewpoints') every respondent could be imputed to. Table 3 illustrates the factor

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

scores and corresponding ranks, which show how each sentence of the Q sample ranks in each of the three factors ('viewpoints') that resulted from the analysis.

Table 2. Factor matrix with defining sorts (indicated by X)

Q sorts	Factors		
	Factor 1 ("Pragmatic")	Factor 2 ("Skeptical")	Factor 3 ("Cautious")
1	0.6472 X	0.0786	–0.26
2	0.6903 X	0.3658	–0.0109
3	0.2751	0.7459 X	0.2068
4	0.5285 X	0.3612	0.2132
5	0.0013	–0.0856	0.0232
6	0.8194 X	–0.2845	0.1738
7	0.5732	0.0582	0.8012 X
8	0.5732	0.0582	0.8012 X
9	0.5835 X	0.1964	–0.1707
10	–0.0182	–0.8446 X	0.0080
11	0.7006 X	–0.2775	0.1666
12	0.8375 X	–0.0412	0.2480
13	0.6289 X	–0.2531	–0.1553
14	0.8513 X	–0.0342	0.2517
15	0.7135 X	0.1299	–0.1905
% explained variance	38	12	11

Table 3. Factor scores and corresponding ranks

No.	Statements	Factors					
		Pragmatic		Skeptical		Cautious	
		Score	Rank	Score	Rank	Score	Rank
1	The public sector will be able to optimize on the opportunities offered by Big Data.	-0.45	15	-0.77	18	0.00	14
2	The public sector will not be significantly affected by Big Data.	-1.14	20	1.03	5	-0.48	18
3	The public sector will need to experiment what features of Big Data work for them.	0.67	9	0.36	11	0.00	14
4	The public sector will be unpredictably affected by embracing Big Data.	0.77	7	0.61	8	-0.48	18
5	The public sector should not be afraid to allow trials and errors when adopting Big Data.	1.06	5	0.56	10	0.48	10
6	The public sector should not loosen its tight regulatory and control systems while adopting Big Data.	0.49	11	-0.92	20	0.96	6
7	The public sector should be concerned that Big Data is not just a matter under the domain of IT specialists.	1.40	1	0.56	10	0.48	10

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

8	The public sector should bear in mind that Big Data do not necessarily imply better service quality.	-0.47	16	0.82	6	1.44	3
9	Big Data initiatives can be stimulated by the competition between public sector agencies or departments to stay at the forefront of technological development.	0.51	10	-0.56	17	-0.48	18
10	Big Data initiatives in the public sector should be centrally coordinated by governmental authorities.	-0.48	17	-0.36	16	0.48	10
11	Big Data offers opportunities to better reach all users of public services and tailor services to their needs.	0.86	6	0.15	13	1.44	3
12	Big Data may be just a technological fad and miss delivering efficient or effective solutions.	-1.27	21	1.28	2	-0.96	21
13	Big Data initiatives in the public sector can succeed if they show how they can solve individual practical tasks.	1.16	3	0.05	14	0.48	10
14	Big Data initiatives in the public sector should be adopted by following formal and explicit guidelines.	1.10	4	0.20	12	0.96	6
15	Big Data may pose some threats to existing public sector organizational systems and routines, and to some public employees' skills and know-how.	-0.83	19	0.67	7	-0.96	21
16	Big Data may pose some threats to security and consistency of public sector activities.	-1.72	24	-1.69	23	-1.92	24
17	Big Data initiatives in the public sector will be adopted if there are adequate individual incentives for doing so.	0.70	8	-2.26	24	-0.96	21
18	Big Data is a serious challenge for the public sector and should not be easily overlooked.	0.29	12	1.33	1	0.00	14
19	Big Data needs to gain the trust of citizens before it is successfully adopted in the public sector.	0.09	13	0.00	15	-0.48	18
20	Big Data in the public sector may be a tool in the hands of the elite for the control of the communities.	-1.62	23	-0.92	20	-1.44	23
21	The introduction of Big Data in the public sector will be hampered by the sunk cost of existing IT infrastructure.	1.35	2	1.13	4	1.92	1
22	The introduction of Big Data in the public sector will call for greater regulation of the Internet in general.	-0.64	18	-1.08	21	0.00	14
23	The introduction of Big Data in the public sector will exclude or marginalise everything that is not digitalized.	-0.29	14	-1.33	22	0.96	6
24	The introduction of Big Data in the public sector will strengthen governmental tools of social control of the masses.	-1.53	22	1.13	4	-1.44	23

The first viewpoint on the role of Big Data in public administration consisted of sentences that we can call a "Pragmatic" view. A pragmatic view of Big Data tends to agree that Big Data offer opportunities to better reach all users of public services and tailor services to their needs, and that initiatives in this area can succeed if they show how they can solve individual practical tasks. While initiatives should be adopted by following formal and explicit guidelines, the public sector should not be afraid to allow trials and errors when adopting Big Data. Moreover, pragmatists tend to agree that Big Data are not just a matter under the domain of IT specialists, although they expect that the introduction of Big Data in the public sector will be hampered by the sunk cost of existing IT infrastructure.

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

The second viewpoint relates to what we can call a "Sceptical" view. Followers of this perspective tend to acknowledge that Big Data are a serious challenge and should not be easily overlooked. However, they also agree that Big Data may be just a technological fad and miss delivering efficient or effective solutions, that Big Data do not necessarily imply better service quality, and that the introduction of Big Data in the public sector might rather serve the purpose of strengthening governmental tools of social control of the masses. They suspect that the public sector will not be significantly affected by Big Data anyway, for reasons that include that the introduction of Big Data in the public sector will be hampered by the sunk cost of existing IT infrastructure.

The third viewpoint on Big Data in public administration relates to what we can call a "Cautious" view. A cautious view tends to agree that Big Data offer opportunities to better reach all users of public services and tailor services to their needs, but also that the introduction of Big Data does not necessarily imply better service quality and bears the risk of excluding or marginalising everything that is not digitalised. Followers of this perspective especially believe that the public sector should not loosen its tight regulatory and control systems while adopting Big Data and that Big Data initiative should be adopted by following formal and explicit guidelines. They also agree, however, that the introduction of Big Data in the public sector will be hampered by the sunk cost of existing IT infrastructure.

It is interesting to notice that the three viewpoints highlight different dimensions of the multi-faceted role that Big Data can play in public administration. With respect to the grid-group dimensions provided by cultural theory, each of the three viewpoints seems characterised by mixed sets of values. Pragmatists tend to especially exhibit agreement with statements that have been conceived as related to an individualist cultural perspective, such as those about the relevance of solving individual practical tasks, the tolerance for trial and errors, and the importance of adequate incentives. The sceptical view seems especially informed by a fatalist cultural perspective, that relates to statements about considering Big Data just an ineffectual technological fad, a tool of governmental control of the masses, and a technology that may affect the public sector in unpredictable ways. Finally, the cautious view seems equally inspired by an egalitarian perspective, that is concerned with the opportunities to reach all users of public services and tailor services to their needs and with the risk that the introduction of Big Data may exclude or marginalise everything that is not digitalised, and a hierarchical one, that relates to the claims that the public sector should not loosen its tight regulatory and control systems while adopting Big Data and that Big Data initiatives should be adopted by following formal and explicit guidelines.

The three viewpoints seem conceptually distinguishable from each other, although they also present some degree of overlap. Any individual who subscribes to either the pragmatist, sceptical, or cautious viewpoints would agree that the introduction of Big Data in the public sector will be hampered by the sunk cost of existing IT infrastructure (thus, in a sense, shared beliefs include a role for the stability of organisational systems already in place). Individuals also generally tend to reject both the statements that Big Data pose some threats to security and consistency of public sector activities and that the introduction of Big Data calls for greater regulation of the Internet in general (thus, in a sense, shared beliefs also include a role for the stability of at least part of institutions already in place). Individuals would also reject statements that Big Data need to gain the trust of citizens before they are successfully adopted in the public sector and that they may serve as a tool in the hands of the elite for the control of the communities (thus, in a sense, beliefs may also include a relatively modest role of Big Data in affecting relationships at the societal level). Closer "affinity" is found especially between the pragmatic and cautious views, as illustrated by the correlation Table 4.

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

Table 4. Correlation between factors

	Pragmatist	Skeptical	Cautious
Pragmatist	1.0000		
Skeptical	0.1143	1.0000	
Cautious	0.6502	0.2052	1.0000

5   Conclusions

This study investigated how the emergence of Big Data is understood to have repercussions on the domain of public administration. Based on a sample of individuals draws from a policy community organised around the use of ICT in public administration in Italy (*Innovatori PA* network), the analysis allowed to identify three viewpoints about Big Data in public administration, namely a pragmatic, sceptical, and cautious perspective. While the three viewpoints share some commonality, they also exhibit distinctive features. As instances of their respective positions, pragmatists tend to highlight that the new technology constitutes an opportunity to better reach all users of public services and tailor services to their needs, sceptics are inclined to agree that the new technology seems to pose serious challenges but also that it may result in a mere fad and miss delivering efficient and effective solutions, and cautious individuals are prone to think that the new technology does not necessarily imply better service quality and that it bears the risk of excluding or marginalising everything that is not digitalised.

The findings of this study bear some implications for our understanding of the impact of Big Data in public administration. In part, they show that the emergence of this technology and the prospect of its application within the realm of public administration stimulate a variety of beliefs, preferences, and meanings among the actors involved in the particular policy domain. In addition, they also show that the emergent discourse on Big Data in public administration develops within a cognitive "space" that includes a role for the stability of existing organisational and institutional systems. The emergence of the new technology, then, is accompanied by the formation of beliefs that are consonant with the prospect of some continuity of existing governance practices and regime for the time to come.

In part, however, the findings of this study also suggest that, depending on the viewpoint towards Big Data in public administration, the emergence of this technology also poses some dilemmas. This may not be the case for those who hold a sceptical perspective, provided that they may easily dismiss Big Data as a technological fad that is not going to significantly affect public services. Followers of the pragmatic viewpoint, however, agree that the public sector should allow some experimentation with Big Data, also at the expense of potential mistakes. Adherents to the cautious viewpoint are concerned that Big Data poses the risk of marginalising or excluding everything that is not digitalised, and they are inclined to recommend public administration to retain its tight regulatory and control systems. Both pragmatic and cautious individuals, moreover, would be in favour of the adoption of formal and explicit guidelines to orient the adoption of Big Data initiatives. The policy community of public employees and public sector consultants considered in this study, then, developed a discourse around the role of Big Data in public administration that also included consideration for challenges, alternatives, and new policies that could be adopted in order to accommodate the new technology within the existing organisational and institutional systems.

The evidence provided by this study suggests some ways in which the emergence of a new technology results in arguments that either support or resist changes to established organisational practices. In part, the views on the role of Big Data in public administration that resulted from the analysis are characterised by a "reactionary" stance (Hirschman, 1991) towards the source of change. For instance, some respondents agreed with statements of the Q sample that can be

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

understood as expressing a "futility" thesis about the impact of Big Data (e.g., Big Data may prove just next technological fad and miss delivering efficient or effective solutions). Other respondents, instead, seem inclined to agree with a "perversity" thesis (e.g., the introduction of Big Data in the public sector will exclude or marginalise everything that is not digitalised). Other respondents, instead, seem to subscribe to a "jeopardy" theses (e.g., Big Data may pose some threats to existing public sector organisational systems and routines and to some public employees' skills and know-how). In part, however, the surveyed views on Big Data also include some stances that call for a proactive approach towards the adoption of the new technology. For example, some respondents agreed to call for the adoption of formal and explicit guidelines for Big Data initiatives and recommended that there is some tolerance for trials and errors when adopting Big Data initiatives.

This study has some limitations that should be duly acknowledged. First, evidence about the perceived role of Big Data in public administration has been collected from a particular policy community (the *Innovatori PA* network in Italy), whose viewpoints may be biased because of specific cultural and national characteristics. Second, the study does not deal with the issue of whether and how ideas about Big Data in public administration, that have been identified through the Q methodology study, play any role to stimulate and affect a policy cycle related to changing practices of ICT in public administration. Third, the study could be supplemented by research on mapping the existing institutional and organisational features of ICT in public administration within the specific country case as a way to clarify how ideas contribute explaining sources of stability and change. This line of research could help improving our understanding of how new technologies are received in public administration and, relatedly, whether the public sector is well positioned to take advantage of the opportunities to innovate organisational practices.

Alberto Asquer: What Shall We Expect from Big Data in Public Administration?:
An Investigation in a Community of Public Service Innovators in Italy.
Yearbook of Swiss Administrative Sciences 2016: Pages 24–37

Résumé

Au cours des dernières années, Big Data a attiré une attention considérable comme source potentielle d'innovation dans l'administration publique. Cependant, le rôle que Big Data peut jouer dans la redéfinition des services publics n'a pas encore été clarifié. Cette étude vise à étudier les points de vue sur l'utilisation de Big Data dans l'administration publique tenue au sein d'une communauté politique particulière d'innovateurs dans l'administration publique en Italie. En utilisant la méthodologie Q, l'analyse montre trois points de vue distinctifs sur ce sujet, qui peuvent être compris comme portant une position «pragmatiste», «sceptique» et «prudente», respectivement. Les résultats de cette étude suggèrent que l'émergence de Big Data déclenche des positions réactionnaires au sein de la communauté politique des innovateurs, mais elle stimule également certaines façons d'envisager la façon d'introduire et d'expérimenter la nouvelle source de changement technologique.

Mots clés: Innovation, Big Data, administration publique, méthodologie Q

Zusammenfassung

In den letzten Jahren hat Big Data als potentielle Innovationsquelle in der öffentlichen Verwaltung grosse Aufmerksamkeit erregt. Welche Rolle Big Data bei der Neudefinition von öffentlichen Dienstleistungen spielen kann, ist jedoch noch nicht geklärt. Diese Studie zielt darauf ab, die Ansichten über die Verwendung von Big Data in der öffentlichen Verwaltung in einer bestimmten politischen Gemeinschaft von Innovatoren in der öffentlichen Verwaltung in Italien zu untersuchen. Unter Verwendung der Q-Methodik zeigt die Analyse drei unterschiedliche Ansichten zu diesem Thema, die als „pragmatistische", „skeptische" und „vorsichtige" Haltung verstanden werden können. Die Ergebnisse dieser Studie deuten darauf hin, dass die Entstehung von Big Data reaktionäre Positionen in der Politik der Innovatoren auslöst, aber es stimuliert auch einige Möglichkeiten zu prüfen, wie die Einführung und Experimentieren mit der neuen Quelle des technologischen Wandels.

Schlüsselwörter: Innovation, Big Data, öffentliche Verwaltung, Q Methodik

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