Accounting, accountability, social media and big data: Revolution or hype?

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Abstract:

Purpose – This paper outlines an agenda for researching the relationship between technology enabled networks – such as social media and big data - and the accounting function. In doing so, it links the contents of an unfolding area research with the papers published in this *Accounting, Auditing and Accountability Journal* special issue.

Design/methodology – The paper surveys the existing literature, which is still in its infancy, and proposes ways in which to frame early and future research. The intention is not to offer a comprehensive review, but to stimulate and conversation.

Findings – We review several existing studies exploring technology enabled networks and highlight some of the key aspects featuring social media and big data, before offering a classification of existing research efforts, as well as opportunities for future research. Three areas of investigation are identified: new performance indicators based on social media and big data; governance of social media and big data information resources; and, finally, social media and big data's alteration of information and decision-making processes.

Originality/value – We are currently experiencing a technological revolution that will fundamentally change the way in which organisations, as well as individuals, operate. It is claimed that many knowledge-based jobs are being automated, as well as others transformed with, for example, data scientists ready to replace even the most qualified accountants. But, of course, similar claims have been made before and therefore, as academics, we are called upon to explore the impact of these technology enabled networks further. This paper contributes by starting a debate and speculating on the possible research agendas ahead.

Key words: Social media, big data, accounting, management control

1. Introduction

The use of new social media, such as Facebook, Twitter, Youtube and blogs has exploded in the last few years, with most of the population (especially, those aged under 30) using one or more technology enabled networks in their day-to-day life, at home, on the go, or in the workplace. The importance of these technology enabled networks, as well as of the data they generate, is visible also at the financial level, with the entrance of social media owners in the share market. For example, Facebook's market cap rose $40 billion to $340 billion during the first quarter of 2016.

The key characteristic of social media technology is the possibility to connect with other users worldwide and to access, post and share information on a regular and continuous basis. Millions of users are now connected locally and globally thanks to the rapid spread of these technologies and their ease of use. One effect of the explosion in the adoption of social media technologies has been the growth of so-called 'big data'. Companies and others can collect, collate and analyse the mass of information mad available on social networks with the aim of improving business performance across a wide range of corporate functions (ranging from marketing, innovation, personnel searches to risk management, and so on). Recently, for example, Accenture (2016, p. 2) has published the results of surveys among practitioners emphasising the need to invest in big data and the results already achieved:

> … big data is taking off. Users that have completed at least one project are very satisfied with their initial forays into big data. The vast majority who have completed their projects report that they are satisfied with business outcomes and that their big data initiative is meeting their needs.[…] big data is definitely disruptive, potentially transformational. The consensus is clear: big data brings disruption that can revolutionize business.

It would be easy to be carried away with the hyperbole that surrounds social media and big data, but to ignore its effects would also be remiss. Social media technologies may afford possibilities not only for users to exchange information but also for others to collect and analyse this information online. New information and control possibilities are created as more customer, employee and stakeholder interactions happen digitally. However, new opportunities create new challenges for organisations and decision makers. What information useful? What data can be relied upon? How can business processes be reshaped to take into account 'digital interactions'? Social media and big data are likely to have wide-reaching

organisational effects, not only in the way in which decisions are made, but in terms of processes and competences, as well as the relative power of actors both within and outside enterprise boundaries.

Accounting professionals, rather belatedly, are turning their attention to the potential of social media and big data. Empirical investigation of both social media and big data for accounting is still in its infancy (Jeacle and Carter, 2011; Scott and Orlikowski, 2012), however, research to date reveals doubts about the reliability of the information gathered, the methodologies for processing it, the risks from using it, the organisational fit, reputational risk management and, finally, the value of the information to be extracted. Despite this, anecdotal evidence and case studies reveal that social media and big data have already changed accounting and accountability in companies although this change often takes place outside accounting functions (commonly through marketing departments). It seems timely therefore to investigate the way in which accounting practices engage with social media and big data.

The purpose of this paper is to promote an agenda for researching the intertwined relationship between technology enabled networks and accounting functions and practices. Section 2 reviews the term 'big data' and outlines some overarching implications for accounting. Section 3 discusses different perspectives from which we can interpret the relationship between accounting functions/practices and the social media and big data phenomena as a means of shedding light on some of the possible research questions that might guide future inquiry and studies. Section 4 introduces the papers in this *Accounting, Auditing and Accountability Journal* special issue. Finally, we summarise offer concluding remarks and outline opportunities for further research.

2. Big data and Implications for Accounting

The definition of big data mostly used by practitioners is attributed to Gartner and describes big data:

> as high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making.[1]

This definition recalls the so-called '3Vs' of big data: volume, velocity and variety. *Volume* refers to the magnitude of data. Discussion about big data is sometimes focused on

the threshold of what is 'big', considering terabytes or petabytes as (emotional) reference. *Velocity* denotes the increased rate of data generation and (potential) processing. The aspiration of advocates of big data is real-time monitoring, which then informs organisations' decision making. *Variety* refers to the desired diversity in the type of data. Big data might include structured and unstructured data coming from different sources, such as administrative data, social media content, photos and videos. This heterogeneity is often discussed in association with the potential of information fusion to provide new knowledge as, for example, in health care (European Commission, 2014). Over time, other 'Vs' have been added such as 'Value' and Veracity' (Wamba *et al.*, 2015).

While these attributes are often used to describe and distinguish the key features of 'big data', we see these concerns as hardly novel for accounting. Volume has been a matter for accounting previously – traditional accounting and financial transactions involve an impressively volume high for large and international groups. Velocity is not new either, considering the need for monitoring real time finance trends, for example, for commodity risk control. Variety is part of the accounting tradition, due to the presence, in the majority of accounting systems, of balanced scorecard and dashboards, where there are financial and non-financial indicators coming from different sources. Finally value and veracity have been always a matter of accounting in its quest for information reliability and significance for decision making.

Aiming to understand the implications for accounting practice, we propose a focus that is less concerned with the attributes of 'data' and more a comprehensive consideration of big data and its connections with social media. Taken together, these technology enabled networks raise interesting questions for accounting in terms of externality, abductivity, and inexhaustibility. While these are not an exhaustive set of dimensions, we see these as important characteristics for exploring and speculating on the accounting-relevant concerns of social media and big data.

Externality relates to the origin of information and data. Many of the new sources included in big data come from the internet source and physical devices (e.g., GPS on cars, cameras, phone signals), which are fed by individuals or organisations outside the company. This externality has a first major implication for accounting because contrary to data usually adopted in accounting and control, big data includes information that is not generated specifically for business uses (Constantiou and Kallinikos, 2015). Thinking, for instance, of images on social media, data are produced by users in one moment and then accessed by others searching for commonalities or patterns in response to business/research interests

(Zhou *et al.*, 2014; Yanai, 2015). This post-access causess difficulties in setting the context in which images have been produced and therefore in interpretation. A second consequence of externality is the lack of total ownership or control over data. This raises concerns linked to privacy, reputation, stability and scalability. Furthermore, although everyone can participate in big data through the democratic internet, the true ownership of data and data mining is in the hands of a few giants that have created a sort of "oligopoly" (Sun *et al.*, 2015).

The second characteristic that we highlight is *abductivity*. It is related to change in the decision-making process as a result of the availability of big data. As noted above, traditionally information used in decision making within organisations was collected on purpose and based on a deductive approach (Constantiou and Kallinikos, 2015). In contrast, big data relies on an inductive approach where a broad business/research question is set, data screened, gathered, modelled and then interpreted. Yet, during this process the initial question is refined in return, entailing a hybrid between deductive and inductive thinking – abductive thinking (Lukka, 2014). This circular process affects data, which becomes more fluid than traditional data. Abductivity emphasises the active role of the data scientist in shaping data as a resource and its characteristics. The desire to capture always new information may lead to greater fluidity and revision of procedures and processes may conflict with innate desires, especially in accounting and audit, to set stable rules and structures.

Finally, *inexhaustibility* concerns the 'representativeness' of information and data. Contained within the 'promise' of big data is the notion that big data allows organisations to strive "to capture entire populations or systems (n =all)" (Kitchin, 2014a, p.1) rather than samples. This is relevant to the conceptualisation of big data for accounting scholars. For example, Twitter allows the possibility to download data through the public API (Application Programming Interface), however, despite the widespread use of this data there are doubts as to its robustness in terms of representativeness of the entire population. First the population is variable in time, but most importantly Twitter does not guarantee that the amount of data downloaded is the entire population available of tweeters. Few studies have addressed this problem, and to the best of our knowledge only Morstatter *et al.* (2013) have explicitly highlighted the drawbacks of public data in term of representation.

These three characteristics affect (to varying extents) the conceptualisation of the interplays between social media, big data and accounting. It is to this that we now turn.

3. Researching the Connections between Social Media, Big Data and Accounting

One possible way to frame the interpretation of the role of social media and big data is to view them as an object (data and information) or as a process (of generating data and information). In relation to their intersections with accounting we might also consider whether technology enabled networks are media through which accounting practice occurs or a target of accounting practice. According to the former, social media and big data are taken up by, yet also enable the alteration of, accounting practice. According to the latter, social media and big data are the focal object engaging with accounting as a practice. While Figure 1 summarises this view, we expand on each category and associated research foci in each of the sub-sections below.

		Conceptualising the relationship with accounting - social media and big data as …	
		a medium of accounting	**a target of accounting**
Conceptualising social media and big data as …	**An object (the data)**	Research focus: new performance indicators based on social media data and big data	Research focus: governance of social media and big data information resources
	A process (generating data and information)	Research focus: social media and big data's alteration of information and decision-making processes	

Figure 1 – Social Media, Big Data and Accounting Intersections

3.1 New Performance Indicators Based on Social Media and Big Data Indicators

Practitioners want to use big data to know more about, and control, other things. This has implications for accounting considering big data as a resource and as a process. To discuss these implications, we use cities as a reference point, as this is an area that has been seen as having potential for big data (see, for example, Mattern, 2015; Kitchin, 2014b). Cities are a hub of a wide range of data: signals from diverse sources, geo-referenced social media data, mobile phone data, wi-Fi data, traditional data and many others.

A first major challenge is that accounting practitioners tend not to see big data as a resource. As we will see later in our paper, several studies in this *Accounting, Auditing and Accountability Journal* special issue show that accountants timidly observe big data at a distance without taking the lead as expected by accounting associations (such as CIMA, the Chartered Institute of Management Accountants, and IMA, the Institute of Management Accountants). Accountants may be reluctant because of pressing deadlines linked to the financial close process (Janvrin and Mascha, 2014) and the abundance of data they already have to deal with. Grounded in deductive thinking, and focused on variables and models that must all fit together, accountants see the fluidity of big data more as a burden than an opportunity.

Regardless, big data is a reality in many organisations and its impact on decision-making processes is evident in the city case. Kitchin (2014b) shows, for example, how several cities, such as Rio de Janeiro or New York, have built infrastructure to integrate data from different sources, with a real-time update in order to control specific activities of city management. Examples include routine activities such as accident management, but also exceptional event management, like the prediction and management of floods. A range of projects, consultancy cases, and academic studies has focused particularly on the potential of social media to monitor cities (Mattern, 2015), including studies using social media to control urban issues, such as temperature (Murakami *et al.*, 2016) mobility (Kostakos *et al.*, 2013), land and space (Frias-Martinez *et al.*, 2014; Shelton *et al.*, 2015).

There is also significant interest in new indicators based on user/customer engagement, which encompasses communication, marketing, customer care and even innovation. This use goes beyond social media data, as it is elaborated and triangulated with other data, often stimulating the exploration of further external sources. Although the interest in indicators originated in practitioner literature, there are now scholarly papers, mostly outside accounting journals, that address this issue. A first stream of papers explores the metrics for measuring the effectiveness of social media in responding to client and user requests (Burton and Soboleva, 2011; Coulter and Roggeveen, 2012; Bonson and Ratkai, 2013; Rohm *et al.*, 2013). These studies usually focus on owned sources (i.e., sources owned by organisations) and paid sources (i.e., sources acquired externally by payment, see Hanna *et al.*, 2011).

A second stream of research has developed and experimented with indicators on network dynamics (user, information flows). Researchers here have developed metrics about the level and speed of diffusion of information across social networks (Kazama *et al.*, 2012; Bakshy *et al.*, 2011; Malthouse *et al.*, 2013). These also extend to users' influence on

company brands, products and services through web sources, for example Twitter, Facebook, blogs, fora, and so on (Bakshy *et al.*, 2011; Phang *et al.*, 2013; Flanagin and Metzger, 2013; Campo-Avila *et al.*, 2013). Despite the mounting number of contributions on specific aspects, so far there is a lack of research addressing the use of these indicators inside organisations. Recent papers have addressed the 'systematisation' of metrics from an accounting perspective (e.g., Agostino and Sidorova, 2016; Arnaboldi *et al.*, 2017). These articles propose classifications distinguishing the source of information (paid, owned and erased) and the nature of the indicator, distinguishing between punctuated and text-derived. Punctuated, refer to metrics built on numbers of specific events related to the network (transaction, access, post), while text-derived metrics are built on the processing of text obtained from digital sources (Sidorova et al., 2016).

These contributions offer insights to reflect on big data as an object. Notwithstanding, several issues remain unexplored. One area in need of further investigation, and with a more critical view, is predictive analytics. Consultancy firms are currently focusing on this, envisioning automatic systems capable of predicting future performance and the need to move from forecasting to 'nowcasting'. The literature to date is narrowly focused on experimentation, overlooking the organisational and decision making implications of these applications.

Another important element for accounting involves the form of these new performance indicators and the communication of information. This element is a promising research path, leveraging on the accounting tradition of visualisation, and going back to the contribution of the Balanced Scorecard (Kaplan and Norton, 1992). More recent studies in accounting have explored how the visual aspects of reporting have a 'powerful' role in data communication (e.g., Quattrone *et al.*, 2016; Busco and Quattrone, 2015; Cuganesan and Dumay, 2009).

Accounting research has examined the role of visualisation and how narratives can be transformed into numbers and visualisation to make the relationships between intangible resources and organisational value visible (e.g., Cuganesan and Dumay, 2009). More recently, Busco and Quattrone (2015) portrayed the Balanced Scorecard and its multi-dimensional set of analytics as a "rhetorical machine", that is, an organising and mediating platform that helps users to invent new solutions and create new managerial knowledge. In doing so, they suggest that, through rhetorical machines, order and knowledge can be continuously classified and questioned, different interests can be accommodated through regular processes of interrogation and re-invention, and engagement can be sustained through participation in a series of recurrent activities. Rhetorical machines such as dashboards and

scorecards have a crucial spatial connotation as they help knowledge classification and invention through the use of visual and spatially based schemas, and allow 're-presentations' to be open to interpretation, appropriation and translation, beyond any stable and ultimate form of objective and unequivocal truth (Busco and Quattrone, 2015).

Big data has stimulated the development of new visualisation tools that sometimes privilege aggregate views over detailed numbers. However, there is also a dark side to this abstraction process – the move away from the local and the particular that may be relevant for organisational action and the recognition of important heterogeneity (Cuganesan and Dumay, 2009). How communication modes of social media and big data information – be these visual, numerical or narrative – enable or constrain organisational actions is an important avenue for future research.

3.2 Governance of Social Media and Big Data Information Resources

Much of the existing research highlights how social media information allows the fluidity and dynamics of cities to be captured with real-time possibilities. However, these studies tend to focus on the benefits of social media with an enthusiastic attitude towards the advantages offered by such technology enabled networks. In doing so they often overlook the important issue of data quality, which is crucial when information is used in decision making. For example, few contributions highlight the twofold problem of representativeness of social media data. First, social media are used by only part of the population and it can be difficult to understand who is using a specific network. Second, and most importantly, providers of social media such as Facebook and Twitter, although offering public interfaces to download data (named Application Public Interface – API) do not guarantee that the entire population of data is available. Hence analysis made through Twitter, Facebook and Instagram data may provide weak signals of variations but cannot be relied on for a strict numerical approach. The issue of non-exhaustiveness is particularly relevant here.

As highlighted earlier in our paper, there is a large variety of metrics (e.g., punctuated, text-derived) and analysis (e.g., prediction, nowcasting) for which processes and procedures need to be constructed. Regarding measurement procedures, there are fewer managerial contributions in the literature, as management researchers seem to prefer interpreting the data collection process and analysis as a black box (Wang and Lin, 2011; Ceron *et al.*, 2013). Only a few marketing scholars have addressed the problem of measurement methodologies. For example, Bell (2012) has proposed a method for analysing unstructured data targeting

specific company objectives while Bajaj and Russell (2010) have developed an alternative aproach. Significant research has been carried out by information technologies scholars, analysing big data information and its requirements in terms of collection and analysis (e.g., Shelton and Skalski, 2014; Balahur, 2014). Researchers underline the difficulties connected with understanding these big data, including reliability, representativeness, and dissemination inside organisations (Boyd and Crawford; 2012; Bianchi and Andrews, 2015).

Another challenge relevant to accounting practice is the use of management controls to ensure that valuable insights from social media and big data information are governed appropriately, ensuring it is sufficiently assured and protected yet able to be shared with relevant partners both inside and outside the organisation. Recognising the new information possibilities posed by social media and big data, information systems researchers are increasingly concerned with how knowledge is governed (e.g., Foss *et al.*, 2010). These researchers are motivated by the observation that a crucial challenge for organisations is "balancing between too much and too little knowledge sharing and knowing how to protect and secure the knowledge that is being shared" (Trkman and DeSouza, 2012, p. 2). However, research examining the interplay between different control types – such as action, personnel, cultural, results – and the balance between information stewardship and sharing is still emerging (Cuganesan *et al.*, forthcoming). Here, future research also needs to adopt a multi-level perspective, examining both organisations and individuals as inter-related units of analyses in determining how knowledge governance approaches and management control mechanisms influence the assurance, protection and subsequent use of social media and big data.

The presence of these benefits and problems opens space for both accounting practitioner and researchers. Accounting practitioners have a long tradition in fitting and checking data to achieve business value (Ma and Tayles, 2009), and therefore may seize the opportunity to balance enthusiasm and rigor in using big data. At the academic level, several patterns are visible. There is a need to have more empirical evidence on how organisations are using big data, and how this might become a resource. The possibility to frame new ways for assessing big data as a resource is also another important opportunity ahead.

An additional area in need of further exploration concerns the way in which big data as an object is transforming the relations between accounting and other organisational functions. Further research is needed to establish which functions own big data and how they are interconnected across the organisation and with accounting functions? Are there new calculative centres, which may reshape organisational power related to information

management? Is there a role for accountants and finance professionals to work with IT, data scientists and business leaders to extract value from data more effectively? Do accountants and finance professionals play any role in leading or orchestrating the integration, interpretation, and usage of these multiple sets of data? Do accountants and finance professionals require new expertise and forms of training? Recent accounting research observes the presence of professional boundaries that limit accounting practices (Kurunmaki and Miller, 2011) but equally accounting may be used to bring together professional groups through enabling shared understandings of the value and potential usability of social media and big data resources.

3.3 Social Media and Big Data's Alteration of Information and Decision-Making Processes

The exploration of big data as a resource opens prompts discussion of the impact on process related to its collection and analysis. Here, it is important that research takes a non-positivistic stance, investigating how big data, algorithms and social media are leveraged to augment the already persuasive power of accounting numbers. One of the consequences of this process is the reduced space left to human judgment, which seems to be increasingly confined to the very last part of the relationship between the construction of knowledge and the actions that follows (Quattrone, 2015).

Accelerated and widened by the digital revolution, the fine line that unites the enabling power of accounting (Ahrens and Chapman, 2004) and the ambiguity and incompleteness of its representations (e.g., Dambrin and Robson, 2011) has been investigated by accounting and organisation scholars for some time. The literature has emphasised how accounting constructs realities (Hines, 1988), constitutes a technology of government and governmentality (Miller, 1990), and is a key element for the rationalisation of organisations, societies, and whole economies (e.g., Miller and O'Leary, 1987; Suzuki, 2003a, b). Accounting acts as an instrument for legitimising organisational and social behaviour thanks to the apparent rationality of its calculations (Meyer, 1986; Carruthers and Espeland, 1991). Therefore, accounting, as much as finance, is performative, that is, the data they produce, and engage with, are engines within markets and organisations (McKenzie, 2006).

The performative role of accounting and big data creates and sustains a paradox in practice. It increases the belief in the possibility of improving rational decision making through better measurement and representation – a dream of full control where distance is cancelled, and databases and statistical models are relied upon to enhance transparency,

predict individuals' wishes and steer future actions. Simultaneously, it augments uncertainty through the spurious correlations and incomplete connections that may emerge from the large amount of data that organisations collect and store (Quattrone, 2015).

Drawing on studies exploring the construction of scientific knowledge 'in action' (e.g., Latour, 1987), a series of seminal papers (e.g., Briers and Chua, 2001; Robson, 1992) examined the fragile nature of accounting and explored its role as an instruments for acting at a distance, both enabling control in large organisations and building an economic logic into management. More recent works have illustrated how accounting has become a powerful system of performance measurement, not because of its supposedly representational ability, but because of its opacity (Dambrin and Robson, 2011), as well as the power relations it enacts (Qu and Cooper, 2011), and the organisational actions its incompleteness generates (Busco and Quattrone, 2015). These articles contribute to the literature that discusses the intrinsically incomplete nature of accountability (Messner, 2009; Roberts, 2009), management controls (Quattrone and Hopper, 2005), and performance measurement systems (Wouters and Wilderom, 2008).

Incompleteness of information can therefore be seen as having a positive (and not a negative) effect on managerial actions and organisational dynamics. Such incompleteness leaves room for debate over strategic courses of action due to the high uncertainty (Wouters and Wilderom, 2008), and fragility (Qu and Cooper, 2011) that surrounds accounting numbers (Meyer, 1986). Chenhall *et al.* (2013), for example, have illustrated how the production of accounts has "the potential to provide a fertile arena for productive debate between the individual and groups who have different values" (p. 269, drawing on Stark, 2009) and how it "can serve to 'crystallise' the compromise" among such different values providing them with transparency (Chenhall *et al.*, 2013, p. 270). These findings echo those in other works that have stressed how accounting (Davison, 2014) and other forms of visualisations, (e.g. engineering drawings, Bechky, 2003; business models, Doganova and Eyquem-Renault, 2009; power point, Kaplan, 2011), construct shared meanings and platforms of mediation to stabilise and mediate among diverse interests (Briers and Chua, 2001).

What could therefore be a possible role of accounting and big data in the current digital revolution? As the etymology of the word 'data' reveals (from Latin datum), data are not only 'given' to be used neutrally in decision making but also 'attribute' by those who produce and consume accounting data (Quattrone, 2015). In this context, politics, pressures, biases and the like all intertwine with figures and numbers, moving individuals away from rational

decisions. Therefore, rather than representing 'answering machines' for the construction of accurate knowledge leading to rational choices, accounting and big data can offer and sustain platforms for achieving wise mediations among the different parties involved (Quattrone *et al*, 2016; Busco and Quattrone, 2015). Ultimately, reasonable, and not rational, choices are what institutions and organisations seek thanks to accounting and big data. The digital revolution seems to offer an opportunity to question and imagine what we cannot know rather than reassure us of what can be measured.

4. Papers in the *Accounting, Auditing and Accountability Journal* Issue

The papers included in this *Accounting, Auditing and Accountability Journal* special issue engage with the three themes of the framework illustrated in section 3: new performance indicators based on social media and big data indicators; governance of social media and big data information resources; and, social media and big data's alteration of information and decision-making processes. Indeed, they progress an agenda that allows us to consider how social media reshapes organisational concerns and how accounting and accountants are implicated in this altered landscape.

The theme of new performance indicators based on social media and big data is taken up by Agostino and Sidirova (2017). Noting the 'new informational possibilities' that social media ostensibly promises, the authors examine how social media both impacts and is impacted by the relationships between customers and centres of calculation within organisations. Empirically, the authors observe new performance indicators in their case study of a telecommunications company, comprising domain rankings, sentiment scores, reach, engagement and influencer measures. By following how these indicators impact how customers and organisations seek to act upon each other, the authors show how the boundary between inside and outside becomes blurred and how social media contributes to a reshaping of organisational–customer relationships. Specifically, social media allows organisations to access novel visualisations of the customer at the same time as the customer gains influence over the organisation. Concurrently, the blurring of inside and outside is problematic. Agostino and Sidirova (2017) also discuss how the 'open ' nature of social media might limit the possibilities for organisational action through difficulties that centres of calculation might have in building cycles of knowledge accumulation and connecting 'outside' and 'inside' notions of the customer. Through their study, the authors highlight the need to explore how social media and big data reshape calculative practices and relationships between those that might engage in, and be the subject of, these practices.

The next two papers discuss the governance of social media. Brivot *et al.* (2017) engages with our second theme, centering upon governance in their study of how social media might impact reputational risk and threaten reputation capital. As the authors note, while social media and big data are sometimes seen as offering new possibilities for organisations in their dealings with customers and other stakeholders there is also a 'dark side', such as risk to the reputation of an organisation through social media which, in turn, requires governance and control actions. Consistent also with our suggestion to examine how social media and big data reshape relationships between organisational experts and specialists (including accountants), Brivot *et al.* (2017) examine how various actors construct organisational control at the intersection of social media and corporate reputational risk through a longitudinal qualitative analysis comprising interviews and various textual analysis.

Their study reveals four frames of the meanings and ideas regarding organisational control in social media namely Beyond Control, Subveillance, De-territorialisation, Re-territorialisation. In all cases managers, consultants or 'gurus', look at social media and big data as an object to be (or not) controlled. The paper shows an unstable situation in which actors use their personal and professional thinking to frame and convince others. Although accounting is central to the notion of control, accountants frame the control problem in 're-territorialisation' terms through big accounting firms as consultants or through claims made by professional association. However, accountants are almost absent within the organisation where, instead, the field is taken by marketing and communication managers and ICT officers.

Similarly, Arnaboldi *et al.* (2017) also focus on governance of social media and big data as objects and how this might reshape relationships between organisational actors, with the focus in this paper on functional specialists within organisations. Through a multiple case study analysis, the authors investigate the governance of social media as an opportunity for organisational actors to change their occupational boundaries. The authors find that accountants appear to be in the background while other actors, such as digital officers and marketing and communication managers enter the territory of performance measurement, constructing through social media information boundary objects, which are capable of connecting and engaging with such technology enabled networks.

Reflecting the inter-relationships across the three areas of our framework, this paper also contributes to our understandings of how social media and big data alter information and decision-making processes within organisations. Arnaboldi *et al.* (2017) illustrate how governance imperatives are intertwined with the development of various social media

artefacts that operate as hybridised boundary objects that condense and translate knowledge from different organisational areas. Collectively, Brivot *et al* (2017) and Arnaboldi *et al.* (2017) highlight the shifting nature of how relationships are framed between social media and organisational concerns, such as governance and control, and how this affects, and is affected by, the interactions between organisational experts and functional specialists both within and outside organisations.

The last two papers in the *Accounting, Auditing and Accountability Journal* special issue are concerned predominantly with social media and big data's alteration of information and decision-making processes. Al-Htaybat and Alberti-Alhtaybat (2017) focus on the impact of big data on corporate reporting and how this is understood by accountants and non-accountants. Through interviews with experts and analysis of textual and video material, the authors identify potentialities for big data to reshape the reporting of corporate information and the role that accountants may play in the process. Al-Htaybat and Alberti-Alhtaybat (2017) complement this with a focus on the paradoxes created by the process of harnessing technology to alter corporate reporting through big data. The authors label these paradoxes empowerment versus enslavement, fulfilling versus creating needs, reliability versus timeliness and simplicity versus complexity, and highlight how they require careful attention and navigation if the potentiality of big data for corporate reporting is to be realised.

Reflections on communication and its directionality is also at the centre of the next paper by Belluci and Manetti (2017). Motivated by the potential for social media to enable dialogic accounting practices that are pluri-vocal in nature, the authors examine how philanthropic foundations utilise social media and Facebook specifically in their communications, conversations and engagement with stakeholders. Studying the official Facebook pages of the 100 biggest US philanthropic foundations, the researchers analyse in detail the contents of messages as well as the way in which organisations are capable of creating and engaging in a dialogue, and around which issues these dialogues occur. Findings reveal a heterogeneous situation, but also nascent dialogic practices whereby some organisations utilise Facebook to both present and accommodate multiple representations of the organisation and how it should operate. Indeed, both Al-Htaybat and Alberti-Alhtaybat (2017) and Belluci and Manetti (2017) highlight how social media and big data can alter information and decision-making processes between firms and their external constituents. As these authors highlight, there is significant potential for social media and big data to result in different information possibilities, more pluri-vocal forms of 'accounting', and a reshaping of relationships between organisations and their stakeholders who conventionally performed the

roles of producers and consumers of accounts respectively. However, as these two papers also acknowledge, there are a number of tensions that require navigation if such potential is to be realised.

5. Final remarks

If many commentators – among consultants, professionals, and academics – are to be believed, we are currently in the midst of a technological revolution that will fundamentally change the way in which organisations, as well as individuals, operate and make decisions. Hence, the importance of this *Accounting, Auditing and Accountability Journal* special issue, in exploring the impact of technology enabled networks, such as social media and big data on the discipline and the professions in an attempt to separate the hype from reality. The paper contained within raise important question for the profession of accounting and how it embraces (or not) the changing organizational landscape the new calculative possibilities that might arise and the extent to which these are used for mangerialist and/or broader societal value purposes. There are also important issues to consider from a policy and regulatory perspective, especially in relation to the practice of organisational communication and reporting and the extent to which social media and big data can be harnessed for enhanced transparency and capital allocation decision-making.

We aim contribute to the setting of an agenda for researching the intertwined relationship between technology enabled networks and the accounting function and practice. To do so we have identified and illustrated three areas of investigation: new performance indicators based on social media and big data indicators; governance of social media and big data information resources; and, social media and big data's alteration of information and decision-making processes. Our intention is not to offer a comprehensive review, but rather to stimulate debate.

What is the role of accounting, accountants, social media and big data within the current digital revolution? This is the key question of future research. We do not expect technology enabled networks to exclude or discourage participation and the process of interpretation in favour of readymade solutions. Rather, we expect accounting, accountants, social media and big data to be part of the future conversation. In this way, accounting can contribute to the decision-making processes by augmenting the capacity of humans to reflect, think critically, and make wise decisions, rather than simply automating individual and organisational responses.

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