Disruption and Legitimacy: Big Data in Society

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Abstract

The growing availability of data and the emergence of business analytics ecosystems offer possibilities for companies developing innovative business models. However, the disruptive impact of these business models on society is not always judged favourably. This paper explores the growing tensions in the relationship between disruptive Big Data companies and society through the lens of legitimacy – a judgement about the fit and propriety of an entity, such as a company, to society. The study is based on four instrumental cases where Big Data organisations were faced with challenges to their legitimacy. The findings elaborate how digital transformations require companies to understand and manage how much to disrupt and how much to conform to social norms and values. Big Data businesses face a dynamic and paradoxical tension between the potential costs and benefits of their disruptive business models. The topic of legitimacy management is also addressed, drawing out implications for practice.

Keywords Big data · Legitimacy · Disruption

1 The Promise and Perils of Big Data

The growing availability of data and the development of business analytics ecosystems offer new possibilities for companies willing to adopt innovative approaches (Huang et al., 2017; Pappas et al., 2018; Tan, 2018; Zhan et al., 2017). From a business strategy standpoint, this has been translated into innovative forms of doing business, such as the sharing economy (Hamari et al., 2016) or the set of phenomena described as Industry 4.0 (Lasi et al., 2014). Entirely new business models have emerged from Big Data and the analytics ecosystems which make use of it. It is now possible to speak about a digital transformation of societies through Big Data, as summarised in the so-called Digital Transformation and Sustainability (DTS) model (Pappas et al., 2018). However, if Big Data are producing business and societal transformation, there is also evidence that those changes can have negative consequences. Emerging business models which harness

Big Data can often be disruptive to entire sectors, industries and even the social structures in which the disruptor operates (Millar et al., 2018). Such instances of disruption, while often delivering cost savings and value to consumers, can have negative consequences. These include – among others – job losses, increased inequality and reduced social cohesion (O’Neil, 2016), threats to individual citizens’ privacy (Degli Esposti, 2014; Zuboff, 2015) and the disruption of democratic institutions (Lytvynenko, 2020; Sherr, 2018). As a result, the role and place of Big Data companies, and the desirability of their business models, are increasingly being discussed by societal actors. This paper explores the growing tensions in the relationship between disruptive Big Data companies and society.

While existing literature, such as the DTS model (Pappas et al., 2018), explains how Big Data can disrupt or improve business models, the impact of those transformations on society, and how society reacts to disruption, remain under-theorised. To address this issue, this paper adopts legitimacy as a theoretical lens (Deephouse et al., 2017). Legitimacy is a core resource for any organisation, making it seem natural and meaningful, and ultimately conferring the organisation with social, as well as economic, fitness (DiMaggio & Powell, 1983; Suchman, 1995). However, companies employing Big Data business models often operate in a paradigm whereby being disruptive is a condition for success (Bean, 2018; Newman, 2014). The disruption they cause can have negative impacts on society, opening the organisation to adverse

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judgements and, subsequently, loss of legitimacy (Ferreira et al., 2019).

The relationships between Big Data organisations and society are under-researched, as well as under-developed from a business management point of view. In the light of these lacunae, this paper addresses two research questions. First, in what ways does the disruptive innovation caused by Big Data business models affect Big Data organisations' legitimacy? And second, how can Big Data organisations manage the challenges to their legitimacy? These research questions are addressed by adopting a multiple instrumental case study design (Stake, 1995), focusing on companies whose disruptive Big Data-enabled business models have provoked controversy and subsequent loss of legitimacy. The paper makes two conceptual contributions. First, it elaborates a model that identifies the challenges faced by companies employing these business models. This model – the *legitimacy-disruption paradox* – stipulates that Big Data companies need to identify a workable trade-off between promoting disruptive changes and fitting with existing social norms and values. Second, the paper extends the DTS model (Pappas et al., 2018), in the light of the legitimacy-disruption paradox, by explicitly including social dimensions and the management of the organisations' legitimacy.

The paper is organised as follows. Section 2 reviews the literature on Big Data and legitimacy. Section 3 details the research methodology and introduces the four case studies. Section 4 presents the findings and Section 5 discusses them through the legitimacy and Big Data theoretical lenses adopted. The paper concludes with contributions to theory and practice, and avenues for future research.

2 Big Data and Society

2.1 Big Data Business Models as Disruptive Innovation

Big Data refer to large datasets of diverse digital data inputs requiring powerful computational technologies to be processed (George et al., 2014). Five dimensions, referred to as the 5 Vs (Erevelles et al., 2016), help define Big Data: Volume – a large amount of data generated per unit of time; Velocity – the speed at which data is generated (Fosso Wamba et al., 2015); Veracity – the trustworthiness (M. Gupta & George, 2016) and quality of data (Janssen et al., 2017); Variety – the different formats of data, such as emails, CCTV videos, audios, texts and financial transactions (Blazquez & Domenech, 2018); and Value – the added value that data provide to organisations (Opresnik & Taisch, 2015). Data need to evidence at least one of the 5 Vs in order to be classified as Big Data. A Big Data company is an organisation whose business model is based on the regular use of Big Data to add value to their activities.

Big Data business models have been characterised as a form of disruptive innovation (Bean, 2018; OECD, 2015; Prescott, 2016; van den Broek & van Veenstra, 2018; Zillner et al., 2016). Disruptive innovations were traditionally characterised as strategic actions taken by companies, which gave them an advantage over competitors in the same market. In this paradigm, the focus of the analysis is the strategy of the disruptor companies; the extent of the disruption is, in general, confined to the market segment in which the disruptor and disrupted operate (Christensen, 1997; Denning, 2016). However, recent scholarship takes a broader view of the extent to which disruption can have an impact beyond the ranking of competitors in a market. Researchers note that the discontinuity provoked by disruptive innovations makes existing business models inviable, and can reverberate across the industry segment, the industry structure and even the social structure in which the disruptor is operating (Millar et al., 2018). Building on this, Kilkki et al. (2018) take a systemic view of the social field on which disruption occurs. In their formulation, a system suffers disruption when a significant portion of agents in that system must reformulate their strategies in order to survive an innovation. The authors classify agents in the disrupted system ranging through *scientific communities*, *R&D units*, *firms*, *industries*, *consumers* and *society/authorities*. All these agents may be disrupted by innovations, and therefore be forced to react (Kilkki et al., 2018). To sum up, disruptive innovation has the potential to impact well beyond the firm or industry segment in which it occurs, and requires those affected to adapt in order to continue to operate.

The possibility that disruptive innovations can affect a wider group of agents raises the question of whether those agents perceive it as attractive (“good”) or adverse (“bad”). In his initial formulation of the term, Christensen (1997) implicitly saw disruption as a net positive: the disruptive technology was assumed to provide the disruptor with a competitive advantage and consumers with added value. In this model, the disruptive technology is only a net negative for the incumbent competitor. This position is consistent with the view of innovation as creative destruction (Schumpeter, 1942), whereby human and social progress require the elimination of less competitive firms. However, expanding the view to take on potential impacts over other parts of the system, the disruptive impact of Big Data becomes more complex, as shown by the growing debate about the opportunities and challenges of Big Data (Chen & Zhang, 2014; Popović et al., 2018; Stahl et al., 2014; Wilson et al., 2017; Zadeh et al., 2019). The opportunities include rapid yet accurate strategic decision-making (Merendino et al., 2018), value creation (Huang et al., 2017), flexibility of resource allocation (A. Gupta et al., 2018), minimisation of costs, customer retention and tackling fraud. On the other hand, Big Data challenges include the lack of skilled workers and other resources (Bharati & Chaudhury, 2019), job losses, increased inequality,

reduced social cohesion (O’Neil, 2016), challenging collaborations with stakeholders (Braganza et al., 2017) and the possible loss of organisational legitimacy (Ferreira et al., 2019; Fredriksson, 2018). In this debate, Pappas et al. (2018) theorise the DTS model in the context of Big Data ecosystems. In the DTS model, Big Data actors – ‘academia’, ‘individuals/entrepreneurs’, ‘industry/private organisations’, ‘civil society’ and ‘government/public organisations’ – can affect value creation and produce business and societal change. These actors are expected to collaboratively develop Big Data capabilities (George et al., 2014) in order to achieve digital transformation and sustainable societal changes. Nevertheless, the model appears to presuppose that said transformation could be easily and readily accepted by societies. However, there is evidence that societies can judge the business models of Big Data companies as a net negative (Ferreira et al., 2019).

2.2 Big Data Companies in Society: The Concept of Legitimacy

Legitimacy consists of a judgement about the desirability, propriety or appropriateness of the actions of an entity – such as a company – *vis-à-vis* prevalent values and meanings in society (Deephhouse et al., 2017). The level of analysis of legitimacy is holistic: according to Deegan (2002), the theory is concerned with the relationship between the organisation and society as a whole, and does not consider individuals’ unique perspectives and evaluations of an organisation (Deegan, 2002).¹ Given that all organisations exist within societies, from which they must obtain resources (human resources, capital, access to markets), legitimacy theory implies the existence of a social contract, which defines whether the organisation’s actions conform to social expectations (Brown & Deegan, 1998; Fernando & Lawrence, 2014). To be legitimate, a business must be well aligned with the norms, rules, values and definitions prevalent in a society (Deephhouse et al., 2017; Scott, 2014). If it remains so, the business will maintain its social license to operate; breaking the social contract can result in this license being revoked (Brown & Deegan, 1998).

In general, most stakeholders will only engage with businesses seen as legitimate (Deephhouse et al., 2017; Lillqvist et al., 2017; Suddaby et al., 2017). Being perceived as legitimate gives an organisation a ‘taken-for-granted’ status; the organisation is likely to be perceived as an objective and natural reality, which means its existence is not in question – the organisation becomes a fact of life (Tost, 2011). In contrast, when an organisation operates in a way that runs against

society’s values, stakeholders can judge that it is outright illegitimate and oppose its existence or demand radical reform. This is the situation faced by companies forced out of business. These two extremes of legitimacy evaluation of an organisation (taken-for-granted and opposed to its existence in its current form) are referred to as *Accepted* and *Illegitimate*. It is also possible to identify at least two intermediate levels of legitimacy: *Proper* – when the organisation is seen as legitimate, but subject to external audit – and *Debated*. In the latter case, the organisation’s actions and fundamental values are actively challenged and questioned in the social system (Deephhouse et al., 2017).

Legitimacy is a society-wide dimension, but it is conferred by specific audiences or evaluators (Bitektine, 2011; Bitektine & Haack, 2015). These evaluators observe and judge an organisation’s actions, and generalise that evaluation into a broader consensus about the appropriateness and fit of the organisation (Deephhouse et al., 2017). Amongst the key evaluators are the state, the justice system and the media. The latter, in particular, is often a key legitimacy evaluator. Research has shown that media reports about companies’ actions lead companies to change their operations, in order to maintain or improve legitimacy (Brown & Deegan, 1998). These judgements are not exclusively fact-based but can also be the result of relatively superficial perceptions about the fit of a business to existing moral norms, beliefs and values (Haack et al., 2014). Judgements of what constitutes appropriate action in a given context are based on distinctive dimensions, sometimes also described as pillars of legitimacy (Lillqvist et al., 2017).

Deephhouse et al. (2017) suggest four distinct dimensions of legitimacy. The first dimension is *regulatory legitimacy*, associated with a perception of whether the organisation follows existing rules. This establishes a ‘baseline’ legitimacy, ascertaining that the organisation is legal, and that engagement with it is unlikely to result in penalties. The second dimension is *pragmatic legitimacy*. This requires an organisation to demonstrate that it can deliver on claims associated with the measurable performance of its products or services. A company whose products systematically fail to perform as described is likely to be seen as illegitimate. The third dimension, *moral legitimacy*, relates to values. To achieve this level of legitimacy, an organisation must demonstrate that it follows collectively valued purposes, values and goals. Illegitimacy, in this case, relates to situations where the actions of an organisation are legal, but seen as immoral. The final dimension, known as *cultural-cognitive legitimacy*, involves demonstrating the fit between an organisation and socially shared meaning systems. These meaning systems are pervasive, and consist of taken-for-granted and shared understandings. Cultural-cognitive legitimacy is a feature of institutions which are entirely embedded in their cultural environment; the simple fact that their existence is questioned suggests that their legitimacy is under

¹ Throughout this paper, the authors follow an institutional approach to legitimacy (e.g., Deephouse et al., 2017), which is not concerned with individuals’ perceptions. An alternative model of legitimacy, which does consider individual judgements, is found in the discipline of social psychology. This latter model is not used in the present research. For a detailed discussion of the commonalities and differences between the two models, see Tost (2011).

threat (Cashmore & Wejs, 2014). Tost (2011) argues that cultural-cognitive legitimacy is a feature of taken-for-grantedness in the judgement process; in fact, it consists of an absence of substantive content in the legitimacy judgement. An organisation achieves cultural-cognitive legitimacy in the absence of questions or challenges to its existence.

Each of these four dimensions of legitimacy plays an important role in stabilising organisations. They promote the use of practices that are formally authorised, deliver the promised benefits, are acceptable on normative grounds, and draw on social understandings. This is especially important for organisations which are promoting innovative products or services: once those organisations become legitimate – once they become accepted social facts – individuals are more likely to adopt the products and services they offer (Gollnhofer, 2017). For this reason, legitimacy management and recovery has become a field of interest to institutions in the public eye. Suddaby et al. (2017) suggest that organisations can adopt three main strategies to recover their legitimacy: conforming, decoupling and performing. Organisations choosing a strategy of conforming will adopt characteristics, practices and norms imposed by regulations, standards or norms (e.g., DiMaggio & Powell, 1983). Organisations adopting a strategy of decoupling might superficially conform to social norms, in order to appear legitimate and buffer and protect their core economic or technical activities. Organisations tend to adopt this strategy when they seek to maintain a degree of fit within the ecosystem where they operate (Suddaby et al., 2017). The performing strategy is usually adopted by organisations which set out to demonstrate their technical superiority over the alternatives. Institutions whose legitimacy is challenged can apply a combination of those strategies in order to manage their legitimacy (Schembera & Scherer, 2017).

The section above demonstrates the fit of legitimacy theory for the analysis of how societies evaluate the impact of Big Data companies. First, the fit is reflected by the level of analysis: this paper takes an interest in the effect of disruption caused by Big Data business models in the societies in which these organisations operate. Legitimacy theory applies to the relationship between the organisation and society as a whole, not individual perspectives. Second, there is precedent: legitimacy theory has been used to research how organisations address and manage societal concerns about the impacts of their operations, for example in terms of environmental impact (Fernando & Lawrence, 2014). This paper applies the framework in the context of Big Data, and the disruption that Big Data-enabled business models create. In addition, legitimacy theory identifies groups of evaluators (such as the media) whose judgements can be used to ascertain how legitimate an organisation is, and criteria along which the organisation's propriety and appropriateness can be assessed (the dimensions of legitimacy). The following section describes the method employed in this paper to explore the growing tensions in

the relationship between disruptive Big Data companies and society.

3 Research Approach

This study applies a multiple case study approach, which explores real-life multiple bounded systems through in-depth analysis of data collected from various sources of information (Creswell, 2007). This approach was chosen because it allows for the empirical study of phenomena in its complexity (McCutcheon & Meredith, 1993), enabling a holistic and contextualised research, through the collection of a multiple types of data (Hartley, 1994).

3.1 Case Study Selection

The study uses instrumental exemplar cases to provide a broader appreciation of how the business models of Big Data companies impact their legitimacy (Stake, 1995). The case studies were selected through purposive sampling, to provide clear, robust and valid insights regarding the impact of each company's business model on society, and how society has reacted to that disruption. This involved selecting information-rich cases, which provide a 'great deal about issues of central importance to the purpose of inquiry' (Patton, 2002, p. 30).

Each of the four instrumental case studies analyses a specific critical event in the history of a well-known Big Data company, which resulted in widespread negative coverage of the company's actions, business failures, legal proceedings and/or the enactment of legislation to outlaw specific Big Data-related disruptive business models. Conceptual aspects discussed in Section 2 also informed the case selection, specifically: which of the 5Vs each case reflected; what disruptive technologies the company employed; and which legitimacy dimensions appeared challenged by each company's business model. Table 1 summarises the key information on the four selected cases.

3.2 Data Collection

The phenomena under analysis are studied in context using a variety of secondary data sources. Multiple data sources were adopted in order to acquire a deeper understanding of the dynamics involved. The aim was twofold: to increase the information base, and to diversify data in order to triangulate findings and reduce bias (Patton, 2002; Yin, 2009), increasing the validity of the findings while also enriching and enhancing their real-world impact (Jonsen & Jehn, 2009). The data collection consisted of an interactive, funnel-like process, which includes three phases (Fig. 1).

Table 1 Key information about the case studies

	Case 1	Case 2	Case 3	Case 4
Company	AirBnB	Google	Facebook	Uber
Business Model	Online marketplace connecting travellers with hosts or other accommodation providers. The company collects a booking fee	Prediction of influenza-like illnesses by collating and regressing search data	Social networking website. The main source of revenue is advertising sales	Ride-hailing service connecting on-demand drivers with users. The company applies a service fee to drivers for each transaction
Prevalence of 'SVs' in the company's business model	'Value' supports a new business model for short term rentals (Marr, 2015)	'Velocity' offered possible new insights into spread of disease, but the 'Veracity' of the data was later questioned (Foster et al., 2016)	'Volume' (i.e. very large number of Facebook users) and 'Variety' (i.e. multiple sources of data) are of particular relevance (Marr, 2015)	'Value' supports a new business model for ride-hailing (Marr, 2015)
Disruptive aspects of the company's business model	Airbnb is regarded as a disruptive innovation considering its innovative internet-based business model (Guttentag, 2015) and its extensive use of data (Geissinger et al., 2020)	GFT used search query tracking to attempt to predict flu outbreaks faster than traditional methods could (Amankwah-Amoah, 2016)	Facebook's business model is centred on users' data. It uses social communication technologies to harvest a variety of formats of data from a broad range of sources which serve multiple purposes such as advertising (Delacroix et al., 2019)	Uber offers cheaper, more accessible, transportation options with a structural cost advantage to both taxi services and potentially even car ownership (Wessel, 2016)
Critical event	New York City protests and court cases, and new regulations against short-term rental (2018)	Negative press coverage of the failure of the Flu Trends programme to outperform standard flu tracking systems (2014)	Allegations about misuse of UK and UK Facebook users' data by Cambridge Analytica (2018)	UK protests and court cases, and prohibition of operating in London (2017)
Dimension of legitimacy primarily affected by the critical event	Regulatory (Witt et al., 2015)	Pragmatic (Keevers, 2019)	Moral (Lischka, 2019)	Cultural-cognitive (Hwang, 2019)
Consequences	Negative media coverage. Challenging lawsuits. Regulation outlawing aspects of its business model	Negative media coverage. Business failure	Negative media coverage. Loss of users. Temporary drop in market capitalisation. Amendments to data policy	Negative media coverage. Challenging lawsuits. Regulation outlawing aspects of its business model. Temporary exclusion from operation

Fig. 1 Data collection process.
Adapted from Lozano et al.
(2020)

1st Phase:

- generate keywords for search strings
- define inclusion and exclusion criteria

2nd Phase (1):

- article search, using search strings
- filter by relevant dates

2nd Phase (2):

- filter by subject area and company name

2nd Phase (3):

- exclusion of duplicates (*129 removed*)

3rd Phase (1):

- exclusion of articles whose first paragraph fails inclusion criteria (*302 removed*)

3rd Phase (2):

- exclusion of articles for which full text was not available (*129 removed*)

3rd Phase (3):

- exclusion of articles after final review (*10 removed*)

3.2.1 1st Phase

Through a series of iterations, the research team generated keywords which would serve as search terms, in line with the research objectives and the literature on legitimacy and Big Data (Appendix 1). In addition, the research team chose inclusion and exclusion criteria to screen the data (Appendix 2).

3.2.2 2nd Phase

Using the combination of keywords in Appendix 1, articles were extracted using Factiva, an international news database

that combines data from a wide range of sources, such as regional, national and international newspapers (e.g., BBC, the Guardian, The New York Times, the Financial Times), magazines (e.g., Forbes), newswires (e.g., Reuters), company reports and material from legal institutions (e.g., the European Court of Justice). The number was then restricted using subject filters of articles, selecting areas (e.g., Science & Technology or Business) which were pertinent to the research objectives, and the filter ‘Company Name’. For each case study, data were collected from the year when the critical event occurred through to the last data available at the time of data collection (October 2019). By applying the keywords previously agreed, 847 articles were initially identified. Of

Table 2 Representative quotes

Code	Quote
Regulatory legitimacy	<p>““Some governments have rules requiring platforms like Airbnb to collect and remit taxes, and we make every attempt to comply with these obligations,” says Christopher Nulty, Airbnb’s head of public policy. “However, many governments do not have such rules and so Airbnb has proactively established more than 500 voluntary collection agreements globally to ensure our community is paying their fair share of taxes. We are eager to do everything we can to ensure we are paying our fair share and willing to work with any government that will work with us.”” (Martineau, 2019)</p> <p>“Facebook failed to keep the personal information of its users secure by failing to make suitable checks on developers using its platform”. (Waterson, 2018b)</p>
Legitimation strategies	<p>“This system is not designed to be a replacement for traditional surveillance networks or supplant the need for laboratory-based diagnosis. The data are most useful as a means to spur further investigation and collection of direct measures of disease activity”. (Ward, 2014)</p> <p>“Recently, the company has tried to appease local authorities by attempting to abide by local laws. It now says it conforms to all local rules and works only with independent, licensed minicab professionals”. (Murgia, 2017)</p>
Data actor	<p>“The failures have continued. As Lazer et al. show in their Science study, Google Flu was wrong for 100 out of 108 weeks since August 2011.” (Salzberg, 2014)</p> <p>“In 2016, he [an Uber driver] and another London Uber driver, Yaseen Aslam, brought a worker’s rights claim against the company, arguing that drivers aren’t true independent contractors and should instead be classified under the U.K.’s third employment category of “worker”—entitling them to minimum wage and paid vacation days. Farrar’s team won the classification case”. (Holder, 2019)</p>

these, 240 were about Airbnb in New York; 156 about Google Flu Trends; 198 about Facebook; and 253 about Uber in the UK. 129 duplicates were removed (40 about Airbnb, 15 about Facebook, 35 about GFT and 39 about Uber), and the remaining 718 articles merged with the dataset.

3.2.3 3rd Phase

To reduce potential biases or errors, the three members of the research team reviewed the first paragraph of each article (in absence of an abstract) independently, to assess whether it fulfilled the inclusion criteria. This led to the removal of 306 articles, leaving 416 articles in the dataset. The last filtering iteration was based on reading/scanning the full papers, resulting in a set of 287 papers. This final set of articles were read and reviewed in full by the team. On closer analysis, however, ten more articles were removed from the final dataset as they did not fulfil the inclusion criteria. This resulted in a total of 277 articles for analysis: 57 about AirBnB in New York; 65 about Google Flu Trends; 74 about Facebook; and 81 about Uber in the UK. The average word count per article for each case study are: 1097 words for Airbnb in New York, 1519 words for GFT, 1417 words for Facebook and 1284 words for Uber in the UK.

3.3 Data Analysis

The data analysis was based on an intensive approach, whereby each case was analysed holistically (Eriksson & Kovalainen, 2016). This resulted in a narrative description of each case’s unique workings, deductively framed by the literature discussed in Section 2. The data were analysed using a

deductive category application or theory-driven content analysis (Mayring, 2000): a directed approach to content analysis to validate and conceptually extend the theoretical constructs discussed in previous sections (Krippendorff, 2004). In line with Hsieh and Shannon (2005), the data were coded using predetermined keywords which synthesise the theoretical constructs under investigation. This deductive coding agenda (Appendix 3) includes a literature-derived definition for each concept, examples from data and coding rules for each deductive keyword, and specifies under what circumstances a text extract can be coded with a keyword (Mayring, 2000). Drawing on the principles of investigator triangulation (Denzin, 1989), all three members of the research team were involved in the data analysis to help minimise bias and increase confidence in the plausibility of the results. Each researcher coded the data independently, and the findings were then discussed amongst the research team, in order to come to an agreement on the main topics emerging from the data. Intercoder reliability (Krippendorff, 2004) and intercoder agreement (Campbell et al., 2013) were maximised through a systematic approach to the elimination of any discrepancies and redundancies. After various iterations, sufficient consistency and validity was achieved (Zhang & Wildemuth, 2009). Examples of how parts of the data were coded can be found in Table 2.

4 Legitimacy Challenges to Big Data Business Models

This section explores how the legitimacy of the four instrumental cases was affected during and after the critical events

listed in Table 1. Each case starts with a description of the events that triggered a legitimacy loss. The analysis then identifies the challenges to their legitimacy that the companies faced from a range of stakeholders, and what actions the companies took to attempt to regain their legitimacy.²

4.1 AirBnB – Protests and Court Case in new York City

AirBnB is an online marketplace that connects people who want to rent out their properties with people who are seeking short-term accommodation. As of late 2019, its website listed more than six million rooms, flats and houses in more than 81,000 cities around the world (Sherwood, 2019). AirBnB's business model has the potential to cause disruption at several levels: for example, hotel owners have complained that the company's low-cost structure, coupled with hosts' reported tax evasion, makes it impossible to compete (Keighran, 2018). The company's business model also creates incentives for investors to buy housing stock for short-term rental purposes (Ferré-Sadurní, 2019), which have been partly blamed for rising rental costs in several cities, leading to protests (Boone, 2018; Hinsliff, 2018; Wachsmuth et al., 2018; Wachsmuth & Weisler, 2018).

This disruption has resulted in increased legal scrutiny of the company. As a result, AirBnB has been accused of operating an illegal rental market in some jurisdictions. Amongst these is New York City, where property owners are not allowed to rent their properties for less than 30 days if they do not reside there themselves (NYC-OSE, n.d.). Research has shown that a high proportion of AirBnB offers in the city followed that model (Hatmaker, 2018).

4.1.1 Stakeholders' Reaction

The situation in New York has led to AirBnB losing legitimacy in the eyes of important stakeholders – not only citizens affected by rising rental costs, but also notably the city government. As a result, a series of laws and regulations have been passed, which directly affect AirBnB's business model. Notably, New York City Council passed new legislation in July 2018 requiring hosts to share their tenants' personal information with the Council, in addition to enforcing the prohibition of short-term leases (Coldewey, 2018). Prior to the global health pandemic that hit the USA in 2020,³ the legislation looked set to cost AirBnB significant market share in the hospitality sector in New York City.

The fallout of the regulatory issues in New York has had a negative impact on AirBnB's business model elsewhere. New short-term rental laws were subsequently introduced in several US cities, such as Boston in January 2019 and Seattle in September 2019 (Simmons, 2019) – suggesting that AirBnB's activities are still subject to challenge and debate. Furthermore, other metropolises look set to follow New York's example: for example, Madrid and Valencia have passed legislation capping the number of days that a given dwelling can be offered for short-term rental in a single year (Coffey, 2017; Spinks, 2018). In France, the government accused AirBnB of not owning an estate agent's licence to operate (Cecco & Willsher, 2019) and required it to register the rooms or flats in the country in order to rent them out.

4.1.2 Company's Reaction

AirBnB has opposed the new regulations in New York, but has so far been unable to change them (Hempel, 2018; Ting, 2017). In order to reduce the impact of future regulation on its business model, the company opted to re-examine its worldwide operations, and to work with the authorities and legislators to ameliorate its social impact. For example, in the UK AirBnB consulted on a government proposal for a register of the identities of its hosts, aimed at preventing illegal short-term renting (Boone, 2018). AirBnB also promised to review and verify every property promoted on its platform by December 2020 (BBC News, 2019b), as an indication of its concern and to demonstrate to regulators and users that its business model is legal.

In its battle to recover its legitimacy, AirBnB secured a victory in a court trial in December 2019. The European Court of Justice ruled that *'it acted as an information society service rather than a real estate agency'* (Boffey, 2019), meaning the company does not need a licence to operate in France. A company statement clarifies this point: *'We want to be good partners to everyone and already we have worked with more than 500 governments to help hosts share their homes, follow the rules and pay tax'* (Boffey, 2019). AirBnB has also settled lawsuits with San Francisco and New York City (Benner, 2017). The company responded to criticisms by cooperating with legislators and the judiciary system rather than opposing it, saying it intends to create *'a powerful people-to-people based political advocacy bloc'* (Hickey & Cookney, 2016). In summary, AirBnB's offering continues to appeal to many users, as demonstrated by a strong market position (Detlefsen, 2018), but the company is struggling to fend off regulation that would target its business model across multiple locations.

² Citations in this Section refer exclusively to empirical materials collected, as per the process described in Section 3. All are denoted with an asterisk in the references list.

³ The impact of the COVID-19 pandemic on AirBnB was not analysed in this paper, as it took place after the data collection cut-off date (October 2019 – see Section 3.2).

4.2 Google – Flu Trends Programme

Google announced its Google Flu Trends (GFT) programme in 2008, as an application of Google's Trends service. The service used Google search data to predict the spread of influenza-like diseases in the United States (Ginsberg et al., 2009), which is normally predicated on the analysis of laboratory diagnostics by the Centres for Disease Control and Prevention (CDC) (Salzberg, 2014). While at the outset of the programme Google stated that the GFT was not designed to replace existing monitoring networks, it also noted its potential to detect flu outbreaks with a reporting lag of about one day (Ginsberg et al., 2009). As a result, the programme was portrayed by commentators as providing the ability to 'nowcast' the flu based on web users' searches (Lazer & Kennedy, 2015). GFT quickly became a poster child for the potential of Big Data to disrupt existing disease monitoring and prevention techniques beyond the United States (Madrigal, 2014).

Despite initial promise, GFT soon began to diverge from the observable spread of flu, providing overestimates of the prevalence of the disease and missing the peak by a wide margin for three consecutive years (Arthur, 2014a; Lazer et al., 2014). Google continued to update the algorithm between 2008 and 2014, including building two-week lagged data from the CDC into the GFT algorithm (Madrigal, 2014) before an academic article (Lazer et al., 2014) noted the magnitude of the prediction errors and the reasons behind them. Not long after, Google opted to terminate GFT (Comstock, 2015).

4.2.1 Stakeholders' Reaction

In their analysis of the programme's performance, Lazer et al. (2014) suggested two fundamental problems: 'Algorithm Dynamics' and 'Big Data Hubris'. 'Algorithm Dynamics' refers to the continuous refinement of Google's algorithm, which offers suggestions against consumers' searches. These suggestions may prompt more searches about flu-related issues, contributing to over-estimation of the spread of the disease. This suggests that the algorithm directly contributed to GFT making less precise predictions than existing methods – the Big Data model performed worse than the legacy systems it sought to replace due to intrinsically Big Data reasons. This problem is compounded by 'Big Data Hubris': the assumption that existing methods of data collection and analysis are inferior to, and can be replaced by, Big Data approaches. This is, perhaps, one of the most problematic aspects of the programme: it appears to have set out to prove, not to test, that Big Data could provide better, more accurate predictions of a widely studied phenomenon (Arthur, 2014a).

The scientific community reacted by publishing further evidence that the algorithm was not able to accurately capture

the spread of influenza. The criticism was echoed in the media, raising questions about the usefulness of Big Data in addressing societal issues (Collins, 2013). By publicly failing to surpass the ability of survey data to predict the spread of flu, GFT has contributed to questions being asked about the usefulness and fitness for purpose of Big Data (Arthur, 2014a), and renewed calls for openness in terms of both the algorithms and data used (Lazer & Kennedy, 2015).

4.2.2 Company's Reaction

Google acknowledged the research that demonstrated the inefficacy of their algorithm and the arguments made by critics, while also defending the predictive power and the benefits of the GFT (RT, 2014). The company then launched an improved version of the algorithm underpinning GFT (Lazer et al., 2014), but eventually accepted that their approach was not working, and the service was closed. Since then, GFT has become a by-word for the limits and problems of Big Data approaches (Yakubuski, 2014).

4.3 Facebook – Cambridge Analytica Event

Facebook is the world's largest social networking website. At the end of 2019, the company had roughly 2.5 billion "Monthly Active Users", 1.66 billion of which accessed the website daily (Facebook, 2020). The company is arguably the world's largest marketing platform, with a revenue of over \$69 million in advertising in the year ending December 31st, 2019 (Facebook, 2020).

In March 2018, it was revealed that 87 million individual users had had their Facebook profile data collected and matched to US electoral registers by Cambridge Analytica (CA), a small British consulting firm which offered services to businesses and political parties seeking to "change audience behaviour" (Osborne, 2018). The data was collected via an apparently innocuous survey app, served to Facebook users, which then also collected users' personal data and preferences. Facebook's design allowed this app not only to collect the personal information of people who agreed to take the survey, but also the personal information of all the people in those users' Facebook network. Ultimately CA acquired data from millions of Facebook users (Cadwalladr & Graham-Harrison, 2018a), used to construct psychometric profiles of users, with a view to identifying possible 'swing voters' and micro-targeting them with political adverts (Sherr, 2018). CA performed these services for Donald Trump's 2016 presidential campaign (Lewis & Hilder, 2018), while one of its partner companies did the same for the pro-Brexit Leave campaign in the 2016 Brexit referendum in the UK (Hern, 2019).

4.3.1 Stakeholders' Reaction

In the aftermath of the revelations, Facebook's market value fell by \$35bn (White, 2018b). While over the following weeks the company saw its stock recover, it subsequently suffered another pronounced drop in value as evidence emerged that users had been abandoning the platform, especially in Europe (Cherney, 2018). Furthermore, when the Facebook data scandal occurred, the #DeleteFacebook campaign trended on Twitter and many users publicly noted their intention to close their accounts (Confessore, 2018). On the other hand, there was pressure on Facebook's CEO, Mark Zuckerberg, to make public statements about CA and their usage of users' data (Solon, 2018a). Recent studies in both the USA (Solon, 2018b; Webster, 2019) and the UK (Waterson, 2018a) indicate that Facebook usage is down, particularly among younger people who are choosing alternative social media platforms. But despite this, most users continue to feel compelled to use Facebook (Forbes Agency Council, 2018). In fact, users who deleted Facebook in the aftermath of the CA scandal often continued to use some of the company's services, such as WhatsApp and Instagram (McCarthy, 2018).

Facebook maintains that there was no data breach in this instance, and that the issue is the result of misuse and mishandling of data by CA and its partners (Valdez, 2018). Critics of Facebook and its practices agree with the company on this, noting that extensive data collection and use is exactly Facebook's business model, which exchanges free services for surveillance (Tufekci, 2018). The problem, they claim, is that the company's business model is opaque and unclear (Romano, 2018), and that surveillance is '...a feature, not a bug' (Franceschi-Bicchierai et al., 2018). The evidence suggests that the system worked as Facebook intended. Nor was the problem one of legality, in that there were no laws against the sharing of data that took place at the time. Users give their consent to data sharing when signing up to Facebook - although there is evidence (Berreby, 2017) that few users, if any, read the legal information that they are required to agree with. The problem in this case relates to the lack of true informed consent in the relationship between Facebook and its users. Commentators have argued that this constitutes a strong violation of widespread ethical and moral principles (e.g., O'Shea, 2018), noting growing privacy concerns (Gupte, 2018) and highlighting a widespread lack of information and understanding regarding personal data (Jenkins, 2018). Moreover, the incident is perceived to have both damaged the reputation of Facebook (e.g., Lee, 2019) and raised questions about the trustworthiness of other firms, even beyond the technology sector (Vincent, 2018).

4.3.2 Company's Reaction

In the aftermath of the crisis, Facebook has attempted to conform to users' stated preferences, without jeopardising its business model. Despite its poor reputation for safeguarding users' privacy (Tufekci, 2018), the company has gone some way towards meeting stakeholders' demands by updating its privacy settings (Wong, 2018), and it has admitted that its policy allowed for data misuse (Thompson, 2019). Mark Zuckerberg wrote in a public note to users that *'We have a responsibility to protect your data, and if we can't then we don't deserve to serve you. [...] We also made mistakes, there's more to do, and we need to step up and do it'* (Wong, 2018). Despite these efforts, Facebook is facing possible government intervention and regulation of its business model. The company has been threatened with the possibility of being broken up under anti-trust law in the United States (Perriello, 2019; Rahman, 2018), and is having to strongly lobby against regulation across various constituencies (Cadwalladr & Campbell, 2019). The consequences of loss of legitimacy in the eyes of stakeholders look set to affect Facebook for years to come.

As for CA, the company attempted to dismiss the accusations made against it, denying any wrongdoing and asserting its own expertise and credibility. CA sought to demonstrate that its algorithm, combined with data, was able to create a superior and unique set of records which addressed the desire of many companies to forecast customers' needs (Cadwalladr & Graham-Harrison, 2018b). However, it was not its technical credibility which was at stake, but its moral and ethical standing: for example, a European Parliament resolution states that CA's deemed technical superiority needs to be legally interpreted as an abuse of power (European Parliament, 2018). Confronted with a powerful public backlash, CA eventually ceased trading (Solon & Laughland, 2018; White, 2018a).

4.4 Uber - UK Protests and Court Cases

Uber, a ride-hailing service, operates an online market wherein drivers log on to an app that directs them to collect passengers. More practical for consumers than a taxi service and offering flexible hours to workers, Uber saw high rates of uptake. However, the company stands accused of unfair work practices: by considering each of its many drivers as a service provider and not an employee, Uber does not acknowledge the need to provide any employment benefits, including holiday pay, paid sick leave, or minimum wage (O'Connor, 2017; Parkinson, 2017). The disruption, in this case, consists of a fundamental upending of the traditional social contract between companies and workers. The company has been rocked by a barrage of driver strikes (e.g., BBC News, 2019a), loss of license to operate in London (e.g., Topham, 2019) and attacks

in the press and social media, focusing on its work welfare practices (e.g., Isaac, 2019; Levin, 2017).

4.4.1 Stakeholders' Reaction

Uber drivers in the UK have gone on strike on multiple occasions (Butler, 2019) and have sued the company in an attempt to secure their workers' rights. The UK High Court ruled that Uber drivers are indeed employees of the company, and are consequently entitled to employment benefits (Evans, 2017; Ram & O'Connor, 2017; Temperton, 2018). The company appealed the ruling to the UK Supreme Court.⁴ Despite being offered a temporary reprieve to comply with UK employment regulations in 2018 (BBC News, 2018), Uber eventually lost its license to operate in London, in part due to their inability to register and assure the identities and rights of their drivers (Thomson et al., 2019). The company's shareholders noted the problems emerging from the company's practices in a letter to Uber founder and then-CEO, Travis Kalanick, explicitly criticising the firm's failure to comply with prevalent social norms: *'The cultural values of Uber need to be transformed to embrace transparency, diversity and social responsibility alongside growth and the bottom line'* (Newcomer & Rosenblatt, 2019). Mr. Kalanick was forced to resign in 2017 (Satariano, 2018).

4.4.2 Company's Reaction

Uber initially attempted to demonstrate the superiority of their business model by aggressively promising to challenge the regulator in court over the anti-competitive ruling. Later, Uber decided to conform with existing employment regulations (BBC News, 2018) in order to continue to operate in strategic cities, such as London. However, the company's efforts were deemed insufficient, and Uber was temporarily banned from operating in London, with the regulator (Transport for London – TfL) noting that it was not a 'fit and proper private car hire operator' (TfL, 2019). Uber proceeded to address regulators' requests, including improving Uber passengers' safety and security by making changes to the app and the terms and conditions of drivers (Abril, 2019). Arguably, the company is struggling to re-establish itself as a legitimate business in the eyes of regulators, especially at city level. Commentators have continued to question whether Uber is interested in passing the test of being a 'fit and proper' organisation to hold a minicab licence (Financial

Times, 2017), or whether it is more interested in distancing itself from its responsibilities (Hoggins, 2019).

4.5 Summary

The cases analysed show different results in terms of how companies' actions can affect the four dimensions of legitimacy. The two cases in which the companies use Big Data approaches to serve as market-makers, connecting buyers and sellers – AirBnB and Uber – are both threatened in terms of regulatory legitimacy. In line with Suddaby et al. (2017), regulators have coercive power to ensure compliance, as organisations need regulatory approval to operate (Zimmerman and Zeitz, 2002). Both Uber and AirBnB's newly created markets attempt to circumvent regulations put in place to protect the investment of existing actors (renters and holders of a taxi medallion, respectively). The subsequent reaction – new regulation, outlawing of their practices in places – has had important consequences for the companies.

All but one of the cases analysed complied with the idea of pragmatic legitimacy; only GFT failed to deliver on its technical promise. For organisations that adopt innovative practices, products or services, diffusion of their technology and their ultimate success will be based on their technical superiority (Deephouse et al., 2017). By failing to demonstrate and persuade stakeholders of the usefulness of their algorithms (Suchman, 1995), GFT not only failed, but arguably became a cautionary tale of the shortcomings of Big Data.

Moral legitimacy appears to be a more delicate dimension for Big Data companies to manoeuvre. The analysis indicates that in three of the cases (AirBnB, Facebook and Uber) there was a failure to comply with existing moral norms in societies. This does not necessarily mean that all individuals aware of the issues condone the companies' actions. In fact, it is likely that many of the users of AirBnB, Facebook and Uber are untroubled by the companies' actions, or may even support them (Bitektine & Haack, 2015). But the actions of the companies have demonstrably gone against principles of fair pricing in housing, freedom from intrusion and unethical attempts to manipulate voting intention, and workers' rights. These actions have resulted in negative headlines, societal-wide disapproval and legal action. Erosion of moral legitimacy has arguably produced some of the strongest reactions against the companies.

All the cases show an erosion of the companies' cultural-cognitive legitimacy, which, as noted, is strongly associated with the 'taken-for-grantedness' of organisations (Tost, 2011). The desirability and fit of each of the four companies studied has been publicly debated, and the companies have been the target of political and legal action, besides loss of earnings (Tost, 2011). By losing their cultural-cognitive legitimacy, each of the companies saw its 'taken-for-grantedness' eroded.

⁴ On the 19th of February 2021, the UK's Supreme Court ruled that Uber's drivers are not self-employed, but rather employees of the company. This means drivers would be entitled to benefits such as minimum wage and holiday pay, which have the potential to severely impact the company's bottom line (Russon, 2021). This event was not analysed in this paper, as it took place after the data collection cut-off date, but is referred to here as it a relevant aspect of the case.

The analysis of the critical cases indicates that the four dimensions of legitimacy should not be viewed as completely distinct, as a failure that appears to be principally located in one dimension of legitimacy can still have repercussions in other dimensions. Similarly, the findings suggest that there is no simple correspondence between the four dimensions of legitimacy and the recognised strategies for legitimacy recovery (conforming, decoupling and performing). The analysis shows that the four case companies adopted a range of strategies in an attempt to recover their legitimacy.

In the main, Airbnb and Facebook adopted ‘conforming’ strategies. While we see elements of the other strategies, such as insisting on the excellence and superiority of their offerings, they largely sought to conform to legislators’ demands and users’ preferences. This is consistent with previous studies that found that organisations adapt their practices in response to legal demands, even where there is no clear economic or technical advantage to doing so (Suddaby et al., 2017; DiMaggio & Powell, 1983; Tolbert & Zucker, 1983). In the case of Uber, there is evidence of ‘decoupling’ and ‘performing’ strategies, at least initially. The company appeared to superficially conform to some legal demands while seeking to demonstrate that its business model was innovative and technically superior. When this blend of strategies did not lead to entirely positive results, the company sought to develop a ‘conforming’ strategy, complying with new regulations. In a similar vein, GFT adopted a mix of ‘performing’ and ‘conforming’ strategies – arguing for the technical superiority of its algorithms while simultaneously admitting to some of its limitations and working with other stakeholders. Over time, GFT faced growing pressure over the validity of its modelling, and sought to conform by adopting some of the methodological prescriptions of external experts.

5 Discussion

This section discusses the paper’s key conceptual contributions.

5.1 The Legitimacy-Disruption Paradox: A Continuum

Big Data and analytics ecosystems have the potential to promote positive digital transformations of societies (Pappas et al., 2018). However, findings from the cases analysed in

this paper show that Big Data companies’ business models can disrupt more than a given industry or sector. The power of Big Data-enabled business models is such that the companies concerned have the potential to disrupt much broader aspects of social organisation. This, in turn, leads to debates about the propriety and fitness of these business models, and to calls for regulation against their impacts. At this point, legitimacy theory makes the prediction that the companies would make every effort to recover their legitimacy. Legitimacy is portrayed in the literature as a property which enables organisations to operate, and the loss of which can constitute a threat to those same organisations (Bitektine, 2011; Deephouse et al., 2017; Ferreira et al., 2019; Gollnhöfer, 2017; Tost, 2011). However, the findings suggest a more nuanced view. When organisations set out to be disruptive and produce (digital) transformations of societies (as per the DTS), they face a paradox: because their business models require them to disrupt the ways in which the economy is organised, their aim cannot be to become fully legitimate. Figure 2 illustrates the two opposing pressures on Big Data companies, which we refer to as the *legitimacy-disruption paradox*.

The findings suggest that Big Data organisations’ legitimacy is negatively related to the disruption caused by its business model. As a result, the *paradox* places the two dimensions – legitimacy and disruption – along the same axis. The levels of legitimacy (noted above the axis in Fig. 2) refer to the legitimacy evaluation of an organisation, proposed by Deephouse et al. (2017). *Illegitimate* refers to an organisation whose stakeholders oppose its existence in its current form. An organisation is *Debated* if its actions and fundamental values are actively challenged and questioned in the social system, and *Proper* refers to an organisation which is seen as legitimate, subject to external audit. Finally, an *Accepted* organisation’s existence is entirely taken-for-granted and beyond debate (Deephouse et al., 2017). Below the axis are two levels of perceived disruption caused by the Big Data organisation, from *Lower Disruption* to *Higher Disruption*. As the Big Data organisation’s business model results in higher disruption its legitimacy will drop, and vice-versa.

The legitimacy-disruption paradox forces organisations in the Big Data space to undertake a dynamic management of their legitimacy, which must be continuously balanced against the need to be disruptive. These companies have to accept lower levels of legitimacy (*Proper* or *Debated*), rather than

Fig. 2 The legitimacy-disruption paradox. Source: authors

aim for a fully *Accepted* level of legitimacy, otherwise their ability to be disruptive is limited. However, they still need to avoid becoming completely *Illegitimate*, as it is possible that the subsequent reaction from society will be sufficiently violent to severely affect their bottom line, as felt by AirBnB in New York and Uber in the UK.

The legitimacy-disruption paradox goes some way towards accounting for the companies' difficulty in addressing the challenges to their legitimacy, as reported in the cases. Only after insisting on the superiority of their business models and failing to recover their legitimacy in the process did the companies attempt to (partially) align their operations with practices and norms in society. However, the organisations' core business models were not substantially changed; instead, the companies made comparatively small changes which brought them from the far left of Fig. 2 (*Highly Disruptive* and *Illegitimate*) and towards the centre (less disruption, but still *Debated*). Each continued to be disruptive for society, but somewhat less so; their legitimacy continued to be contested, but less fiercely so. This dynamic is likely to continue as the impact of Big Data over the way society is organised plays out.

The first research question this paper set out to address was as follows: in what ways does the disruptive innovation caused by Big Data business models affect Big Data organisations' legitimacy? The findings show that the disruption caused by their business models erodes the companies' legitimacy, often across more than one of the dimensions of legitimacy. The companies then face the need to dynamically manage their legitimacy level by engaging external stakeholders and effecting moderate changes to their business models, in order to regain some legitimacy while continuing to be disruptive. This suggests the need to account for legitimacy in models which attempt to theorise how Big Data can effect transformations in society. This is explored in the next section.

5.2 Legitimacy, Stakeholders and Societal Change

The DTS model (Pappas et al., 2018) aims to conceptualise the factors that Big Data ecosystems need to have in order to enable digital transformation, resulting in business transformation and value creation. This paper expands on the DTS model, by explicitly noting the importance of societal factors. The findings in this paper show that Big Data organisations need to dynamically manage their legitimacy, treating it as transient rather than permanent (Suddaby et al., 2017). This means that Big Data companies constantly need to put forward strategies to safeguard or recover their legitimacy. If Big Data organisations are not legitimate, they will fail to create value and generate business and societal change in a way that the entire ecosystem can benefit from. These insights result in the Updated DTS model (Fig. 3).

The Updated DTS model explicitly includes the social dimension under a newly added component, "Legitimising Big Data Organisations" (third box from the left), placed alongside the "Data Actors" and "Big Data Analytics Capability". At the core of this new component is the need for "Managing the Legitimacy-Disruption Paradox". As noted above, the legitimacy of these companies must be managed in a dynamic fashion. This is because the "Disruptive Innovation" they base their business models on can result in "Threatened Legitimacy". Even as the organisation recovers legitimacy, it is likely to use Big Data to produce other disruptive innovations, which may threaten its legitimacy again. As a result, the third aspect of the triangle in Fig. 3 is the "Legitimation Strategies" the company must develop to address new legitimacy challenges. The findings of this study show that Big Data companies do not necessarily apply a specific strategy but a combination of them. This adds to the disruptive innovation and legitimacy literature, where there is growing evidence that encapsulating legitimation into static strategies can only partially address the challenges posed by disruptive innovation (Ben-Slimane et al., 2020; Patala et al., 2019; Suddaby et al., 2017). The findings suggest that the legitimacy

Fig. 3 Updated DTS model. Source: authors, adapted from Pappas et al. (2018)

dimensions and strategies contribute, in a mutual, simultaneous and interconnected way, to the survival and strength of Big Data organisations within a disruptive innovative environment.

The second research question that this paper set out to address was as follows: how can Big Data organisations manage the challenges to their legitimacy? The findings suggest that these companies need to combine existing legitimisation strategies, and potentially develop new ones, in order to dynamically manage their position in society. If a company needs to continue to operate in the range of *Proper* to *Debated* legitimacy, this must be kept under continuous review by managers. Furthermore, social values are also dynamic. Firms like Airbnb, Facebook and Uber have both adapted themselves to, and pushed back against, the pressures they experienced. They appear to feel both supported by users who see the benefits of their new business models, and challenged by stakeholders who point to the downsides of their disruptive innovations. Big Data firms must consider the different dimensions of legitimacy discussed here as, over time, changes that improve their position against one dimension might damage their standing with regard to another dimension of legitimacy. For example, a move that enhances their position regarding regulation or moral values might damage their ability to deliver what is perceived to be an attractive service to users. The legitimacy-disruption paradox can help managers to understand and explore these challenges as they play out over time. The positioning of the paradox within the DTS model highlights the societal side of the transformations at play. Digital transformation must be considered not only in relation to value creation and business change, but also in relation to societal change – and legitimacy theory is a valuable lens for articulating and elaborating the key issues of societal disruption driven by Big Data.

6 Big Data, Disruption and Legitimacy: Which Way Forward?

This paper has analysed how society evaluates Big Data business models, in the light of the disruption they can cause. It found that Big Data companies need to dynamically manage their legitimacy level, not attempt to become entirely legitimate. As a result of this, the companies may need to enhance or merge existing legitimisation strategies, or develop entirely new ones.

6.1 Conceptual Contributions

The paper makes two conceptual contributions. First, the *legitimacy-disruption paradox* elaborates the challenges faced by companies employing Big Data-driven business models.

The model stipulates that there is an inverse relation between the disruption caused by a company and its legitimacy. Big Data companies need to identify a workable trade-off between promoting disruptive changes and fitting with existing social norms and values. This goes beyond previous understandings of legitimacy as a dimension which all companies seek to maximise. Instead, this paper argues, companies may wish to actively manage their legitimacy level, trading off some social fit for the ability to be more aggressively disruptive. However, this dynamic management must be carefully judged, as greater levels of disruption may lead to the organisation being seen as illegitimate, and penalised accordingly.

Second, the paper extends the DTS model (Pappas et al., 2018), in the light of the legitimacy-disruption paradox, by explicitly including social dimensions and the management of the organisations' legitimacy. Where the original DTS focused on technical competences and human skills, the Updated DTS explicitly highlights that transformations can often face opposition. While Big Data can enable organisations to produce net positive outcomes, it can also affect groups of stakeholders. Failure to legitimise transformative business models can result in their failure.

6.2 Implications for Practice

The results suggest various implications for practice. First, it is more likely that an innovative project that is kept 'at arm's length' from the core business (e.g., GFT) can be terminated without significant damage to the organisation's other activities. This appears to be a safer way to proceed if a project is deemed to bring a high level of risk.

Second, managers of Big Data businesses should consider making use of a tool such as the *legitimacy-disruption paradox* depicted in Fig. 2, in order to articulate the nature and level of disruption that their business model may entail. This can assist them in identifying and debating actions to adapt their activities to a more acceptable position, or indeed to push the boundaries of acceptability and attempt to promote a shift in societal values and judgements. Managers can also help address this by building considerations about legitimacy into their strategic thinking.

Third, although existing theory suggests that legitimacy has four distinct dimensions, it is important for managers to consider that erosion of one dimension of legitimacy (for example, violating moral or fairness principles) may result in pushback across other dimensions (such as regulation or loss of users). Managers need to view legitimacy as both an overarching idea and one that is built on several dimensions. For management scholars, further work is needed to develop the theory of legitimacy as both a holistic and multi-dimensional concept.

6.3 Limitations and Future Research

The study has several limitations, which lead to suggestions for future research. First, some organisations are likely to experience explicit challenges to more than one legitimacy dimension. The four critical cases were selected to provide a primary focus on the dominant legitimacy dimension. However, the findings highlight that a loss of legitimacy in one area can have consequences in other areas. Future research should address instances of a loss of legitimacy across multiple dimensions.

Second, as the four case studies focus on international companies, it is likely that they may have faced other challenges in different countries. However, this paper focused on a specific critical incident, at a given time and in a given locality. Future studies should adopt an international dimension on incidents of loss of legitimacy, elaborating on the impact of an incident in one locality on the organisation's status across multiple geographic locations.

Third, the methodological approach of the study – based on secondary data relating to four critical cases – did not allow the researchers to adopt a longitudinal approach. A future study based on a single, in-depth case would allow scholars to analyse how an organisation responds to legitimacy loss, and study its legitimacy recovery strategies over time. Such a study could also seek to gather primary data from key data actors such as employees and customers.

Finally, future research based on this paper's contributions should assess how specific business models can affect companies' preferred position along the legitimacy-disruption paradox. Related to this, future research should also investigate the mechanisms by which companies can contribute to shifting society's values, making previously illegitimate positions debated and/or legitimate.

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