# Digitalisation versus regulation: How disruptive digital communication technologies alter institutional contexts through public interest framing

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## Abstract

In this paper, we investigate how digital technology disruptors and the incumbents who stand to be disrupted by them frame their arguments to transform or sustain existing institutional frameworks to enable or deter the market entry of these technologies. Using a longitudinal, comparative case analysis of three digital technologies—namely, Voice over Internet Protocol (VoIP), cloud antenna, and over-the-top (OTT) technologies—we explore how stakeholders use public interest frames for this purpose. We find that entrepreneurs use three specific frames to drive institutional change for the successful adoption of digital technologies in the presence of established incumbents and powerful regulators: frames that emphasise the broad public appeal of the new digital technology; frames that emphasise efficiency, democracy, and technological advancement; and frames that emphasise present as well as future benefits to the public. We find that constructing interpretations of what serves the public interest is the primary tactic used by disruptors to gain market entry, and an equally popular weapon for incumbents to block the entry of new digital technologies. These interpretations lead to a framing contest aimed at influencing regulators and obtaining a more favourable institutional environment. Our empirical findings illustrate that new digital technologies themselves are not the sole contributors to institutional change. Rather, institutional outcomes associated with the introduction of new digital technologies are shaped by how disruptors and incumbents use public interest frames and how regulators react to these frames.

## Keywords

Digital technologies, framing, regulation, institutional transformation, public interest

# INTRODUCTION

Digital technologies can be disruptive, field-changing innovations that radically alter existing institutional practices and force institutional actors to deal with the unknown (Christensen, Raynor, & McDonald, 2015). Digital transformation is associated with significant impacts on business activities, including governance (Whittington & Yakis-Douglas, 2020), distribution, services, access, participation (Kulesz, 2017), and dramatically altered organizational forms and strategies (Brynjolffson et al., 1994; Sia et al., 2016), as well as the evolution of institutions (Lanzolla et al., 2018).

Whereas the past decade has been characterised by disruptive innovation, the past few years have been a particularly eventful period of institutional transformation due to disruptive digital technologies. Companies such as Uber, Airbnb, and Bitcoin have challenged current institutional frameworks, forcing regulators to take action (Hinings, Gegenhuber, & Greenwood, 2018).

It is not uncommon for regulators to ban companies with disruptive digital technologies from operating due to public interest concerns (Uzunca, Rigtering, & Ozcan, 2018). In fact, in the two decades of the Internet era, many world-changing technologies—web publishing, file sharing, virtual currencies, ride hailing—have surfaced new legal and regulatory questions. New entrants with digital technologies diverge significantly from incumbents in the ways that they create, deliver, and capture value (Autio, Nambisan, Thomas, & Wright, 2018) and therefore have the potential to disrupt incumbents and their institutional environments (Kenney & Zysman, 2016; Prahalad & Ramaswamy, 2003).

Although it is generally assumed that new entrants with disruptive, game-changing digital technologies would be able to leverage them to gain regulatory

support and eventually rewrite the institutional rules of the game, this is not an easy feat when incumbents push back. We posit that this process is closely related with the *public interest* construct in regulated markets, and that through public interest framing, both new entrants and incumbents attempt to influence regulators to either support the new technology or stick to old institutional rules and regulations to hinder its growth. The resulting outcomes—in terms of maintaining or changing those institutional rules—may therefore be explained not only by interactions among new entrants and incumbents, but also by regulators' active involvement in co-constituting the dominant frame. By inscribing framing with this interactive and co-constitutional role, we advocate for a communication-centred view of institutionalism (Cornelissen, Durand, Fiss, Lammers, & Vaara, 2015).

Comparing the market entry episodes of three digital technologies—namely, Voice over Internet Protocol (VoIP), cloud antenna, and over-the-top (OTT) technologies—we explore how market entrants and incumbents use public interest frames to obtain a more favourable institutional environment for their services. Our analysis reveals three types of public interest frames associated with the successful entry of digital technologies into markets with established incumbents and powerful regulators: frames that emphasise the broad public appeal of the new digital technology, frames that combine efficiency and democracy benefits with technological advancement, and frames that emphasise present as well as future benefits to the public. Our findings reveal how institutional outcomes regarding digital technologies are (at least partly) determined by the effective use of public interest frames, and regulators' reactions to those frames. Before presenting details about the study, we review relevant literature in the next section.

## THEORETICAL BACKGROUND

A plethora of research suggests that rapid evolution of digital technologies and infrastructures have significant organizational, economic, and institutional consequences for organizations (Hinings et al., 2018; Majchrzak & Markus, 2013; Nambisan, 2017). Extant literature shows that some of these institutional changes involve major shifts in the long-term competitive positions of incumbents due to long response times or an inability to respond in ways that meet or exceed the improvements brought by the new technologies (e.g., Abernathy & Utterback, 1978; Christensen & Bower, 1996; Henderson & Clark, 1990; Tripsas & Gavetti, 2000; Tushman & Anderson, 1986). Schumpeter (1942) described this process as creative destruction, where new technologies introduced by new entrants replace old technologies, along with the incumbents that rely on it. The rapid evolution of digital technologies and infrastructures has significantly accelerated this process, leading to well-documented negative effects on competitive advantages for firms that opt out or are unable to participate in these transformational changes (see for example, Majchrzak & Markus, 2013; Nambisan, 2017; Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). Digitalisation is already transforming institutional contexts at dizzying speed, and this transformation has been accelerated even further in some industries due to organizational responses to the Covid-19 pandemic. The International Data Corporation (IDC), which predicted that at least 55% of organizations would be 'digitally determined[1]' by 2020, has noted that this prediction

[1] IDC defines a digitally determined firm as one with an integrated strategy, where continuous enterprise-wide digital innovation is in place.

may be conservative due to a greater than 10% increase in global spending on digital technologies and services.

Existing literature documents how incumbents may attempt to alleviate their disadvantageous position relative to new entrants with disruptive technologies. One potential response is to rely on their established relationships with current regulatory actors to find alternative solutions in the institutional realm (Eckert, 1981; Gurses & Ozcan, 2015; Ingram & Rao, 2004). This may especially be true when disruptive technologies challenge existing regulatory frameworks, thereby providing an incentive to regulators to change the nature of market competition by permitting or banning the disruptors from market entry.

**Strategic Framing and Meaning Construction**

A frame is an 'interpretative schema that simplifies and condenses the world out there', thereby organizing experience and guiding action by 'rendering events or occurrences meaningful' (Snow & Benford, 1992, p. 37). Neo-institutional theorists consider frames to be part of the very fabric of institutions, 'emphas[ising] the role of cognitive frames and meaning structures as decisive for the explanation of economic outcomes by broadening the notion of institution' (Beckert, 2010, p. 607). Neo-institutionalists like Beckert (2010) and Scott (2003) portrayed institutions as inter-subjectively shared meanings, and thus nearly indistinguishable from cognitive frames. Indeed, frames are at the very core of the cultural-cognitive aspect of institutions, which 'involves the creation of shared conceptions that constitute the nature of social reality and the frames through which meaning is made' (Scott, 2003, p. 880). Frames also can go beyond defining the current state of institutions and play a significant role in shaping institutional change through tactics such as frame switching and blending (Werner & Cornelissen, 2014).

Within institutional theory, the notion of opposing actors attempting to influence the environment to yield favourable results, particularly through *strategic framing* and *framing contests*, has been gaining traction. In attempts to change the institutional environment, actors use framing to manage perceptions of various stakeholders (Hargadon & Douglas, 2001; Rao, 1998) by establishing common meanings (Guerard et al., 2013; Lounsbury et al., 2003).

Earlier empirical work on frames focused primarily on the activities of interest groups rather than corporations. For instance, interest groups utilised environmental justice frames (Cable & Shriver, 1995), rights frames (Valocchi, 1996) and choice frames (Davies, 1999) to fuel social movements. More recently, however, scholars have become interested in how *firms* can use various frames to influence the regulatory environment against opposing actors. In their study on supermarkets, Ingram and Rao (2004) showed how, despite their size disadvantage, incumbent grocery stores organized a social movement and achieved a temporary ban against supermarket chains entering the retail industry. Prior studies also have documented *framing contests* between opposing actors as a central mechanism leading to institutional creation and change (Guerard, Bode, & Gustafsson, 2013; Gurses & Ozcan, 2015; Ryan, 1991; Schneiberg & Soule, 2005).

Institutional change also is driven by language and symbolic gestures of institutional actors in the absence of framing contests. Field-level frames, deliberately constructed or not, become institutionalised and function as broad templates of understanding by providing abstract scripts and rules for appropriate behaviours in particular settings (Werner & Cornelissen, 2014). The construct of framing within institutional theory is increasingly viewed as a communication-centred approach to understanding meaning construction in and around organizations (Ansari et al., 2013;

Gray et al., 2015). Strategic frames are at the forefront of these: scholars have argued that research on strategic framing would benefit from increased attention to the co-construction of meaning in the communicative process (Cornelissen, Durand, Fiss, Lammers, & Vaara, 2015). In this respect, our study follows recent research that considers audience-centred aspects of the framing process (Cornelissen & Clarke, 2010; Rhee & Fiss, 2014). Accordingly, communication is a process whereby collective forms such as institutions are constructed in and through interaction (Ashcraft & Mumby, 2004; Cornelissen et al., 2015; Werner & Cornelissen, 2014).

**Framing around Evaluation of Disruptive Digital Technologies**

While framing matters for the proponents and opponents of any institutional realm involving corporations, it is likely to be highly significant in the context of digital technologies due to the scalability, growth, and value chain disruptions that typically accompany them. Prior literature shows that new technologies require a defined institutional space to govern the production, distribution, and consumption of associated artefacts (Dosi, 1982; Rosenberg, 1982; Van de Ven & Garud, 1994). Until this is established, however, new technologies often introduce uncertainty (Anderson & Tushman, 1990; Bower & Christensen, 1995; Hargadon & Douglas, 2001; Tushman & Anderson, 1986; Weick, 1990). Under such circumstances, actors need to make sense of the situation before they can act (Weick, 1995). Regulatory agencies are thus forced to deal with the unknown and are subject to influence (Benner & Tripsas, 2012; Gurses and Ozcan, 2015; Hilgartner & Bosk, 1988; Kingdon, 1984). The uncertainty created by new digital technologies is thus likely to provide additional opportunities for incumbents and new entrants to use *framing* to influence regulators and the general public (Gurses & Ozcan, 2015).

When new entrants introduce disruptive digital technologies, market incumbents often attempt to maintain the status quo by opposing market entrants, as shown in various contexts involving newspapers (Gilbert, 2005), cameras (Tripsas & Gavetti, 2000), travel agencies (Osiyevskyy & Dewald, 2005), business software (Snihur et al., 2018), and others. At the same time, market entrants aim to obtain regulatory and socio-political legitimacy for their products and services to secure long-term growth (Aldrich & Baker, 2001; Ingram & Rao, 2004). For instance, Dowell, Swaminathan, and Wade (2002) described how major networks and other broadcasters used framing processes to mobilise support for retaining control over the broadcasting spectrum under the guise of supporting the development of HDTV in the United States. In other empirical studies on framing, Hargadon and Douglas (2001) found that new electric lighting systems were framed using familiar terms associated with existing gas lights, and Lounsbury, Ventresca, and Hirsch (2003) found that environmental activists for recycling needed to be able to frame recycling as part of a broader dialogue (i.e., a field-level frame) in order to mobilise resources. Finally, Gurses and Ozcan (2015) discovered that effective framing of pay TV as a complementary service to free TV for rural areas and minority populations enabled entrepreneurs to win a framing contest against incumbents and influence regulators in their favour when introducing pay TV to the highly-regulated U.S. television sector.

**The Public Interest Frame in the Regulation of New Technologies**

Whereas framing has received significant attention from scholars, the key public interest frame employed by market entrants and incumbents to enable or deter disruptive technologies is largely absent from empirical studies. Public interest, sometimes referred to as ‘the general welfare’ or ‘common good’ (Mahoney,

McGahan, & Pitelis, 2009), is generally used as an overarching ethical criterion when considering whether something benefits wider society (e.g., Amao & Amaeshi, 2008; Brown, 2006; Buchholz & Rosenthal, 2004; Carson, 2003; Detomasi, 2007; Fisher, Gunz, & McCutcheon, 2001; Harrington, 1996; Jamal & Bowie, 1995; Johnson, 1986; L'Etang, 1994; Lewis, 2008; Roberts, 2003; Santos, 2012). Regulators and other government institutions claim to adopt and implement policies 'in the public interest' (MacAvoy, 1992; Schuler, Rehbein, & Cramer 2002).

Various scholars have noted the existence of different definitions of public interest based on multiple, sometimes incompatible conceptions (Morrell & Harrington-Buhay, 2012; Perry & Rainey, 1988), whereas many others have left the term undefined, risking a conceptualisation of public interest that is too malleable and fluid. Pickhardt (2005) explained how, over time, the term 'public interest' has been used to refer to: upholding a principle of justice; the successful combination of efficiency and fairness by an administration; a sense of community or togetherness to the benevolence of a governing elite; and citizens' behaviour, both individually and collectively. Others have used public interest as an evaluative criterion to refer to a specific course of action or to evaluate change (Lewis, 2008).

In the literature on public interest, one crucial defining characteristic is its equivocality, implying that multi-sided contests define reality (Daft & Weick, 1984), and that competing conceptions of reality are often either mutually exclusive or in conflict (Daft & Weick, 1984; Weick, 1995; Townsend, Hunt, McMullen, & Sarasvathy, 2018). Daft and Macintosh (1981) defined equivocality as the knowledge problems stemming from the existence of multiple meanings or interpretations. Equivocal situations have no objective answers (Weick, 1979). Although often conflated with ambiguity, equivocality is a distinct condition because each individual

interpretation is unambiguous; differences emerge when interpretations are viewed collectively (Townsend, Hunt, McMullen, & Sarasvathy, 2018). Competing conceptions of reality that characterise equivocality are often either mutually exclusive or in conflict (Daft & Weick, 1984; Weick, 1995), similar to the way that public interest unfolds. Conflicting or mutually exclusive definitions of what is in the interest of the public are akin to historical examples such as disputes over the scientific foundations of climate change (Bastianoni, Pulselli, & Tiezzi, 2004) and carcinogenicity associated with smoking (Ong & Glantz, 2000). Townsend et al. (2018) provided more recent industrial examples of equivocal circumstances of entrepreneurial action in contexts such as cloud computing (Armbrust et al., 2010), education (Ball, 2013), cyber-security (Byres & Lowe, 2004; Choo, 2011) and nano-scale technologies (Baird, Nordmann, & Schummer, 2004).

In this study, we investigate how the notion of public interest is constantly co-constructed and altered by the use of strategic frames for and against market disruption by digital technologies. Through a longitudinal comparative case analysis of VoIP, cloud antenna, and OTT technologies in the broadcasting technology context, we examine how digital technologies create regulatory uncertainty and give rise to the strategic use of public interest frames by various actors. As we illustrate through our cases, different public interest frames were used both by change agents and proponents of the status quo. We illustrate how this back-and-forth between market disruptors, incumbents, and regulators helped co-create the dominant definition of public interest at given points in time.

Examining the use of the public interest frame in the context of disruptive communication technologies is theoretically and empirically interesting, because these settings often occasion large, widespread change which affects many thousands,

if not millions of members of the public. Furthermore, the effects of these technology changes are almost immediately observable. We argue that in these settings, the notion of public interest is key to understanding how rival stakeholders frame their arguments, and eventually affect technology adoption and societal change.

Arguably, one of the critical determinants of a disruptive technology's fate is the position of the regulatory agencies, which, based on their normative role to benefit society as a whole, often explain their actions and recommendations in terms of serving the public interest (Pigou, 2013). However, with the exception of Gurses and Ozcan (2015), who identified the existence of a public interest frame without deconstructing its various dimensions, scholars have neglected this concept and its role in regulatory decision-making and institutional change. We aim to fill this gap by scrutinising whether and how market entrants and incumbents use the concept of public interest in their framing activities, particularly in the face of disruptive digital technologies that await regulation, and how, as a result, institutional change occurs through a co-constructed and constantly evolving notion of public interest.

## METHODOLOGY

To investigate how public interest functions as a cognitive frame in contexts involving disruptive technologies, we carried out an inductive, longitudinal, comparative case study (Eisenhardt, 1989; Graebner, Han, & Ozcan 2017). Comparative case studies enjoy an advantageous position between single and multiple case studies because replicating the findings from one case with one or two others can lead to more robust and generalisable theory without significantly compromising the richness of the data (Graebner et al., 2017). Comparative case designs have been used extensively by management scholars (e.g., Gurses & Ozcan, 2015; Kellogg, 2011; Noda & Bower, 1996; Rindova & Kotha, 2001). They can be useful by highlighting

contrasts between the chosen cases (e.g., Battilana & Dorado, 2010; Gurses & Ozcan, 2015; Kellogg, 2011) or similarities (e.g., Heinze & Weber, 2016).

Our longitudinal approach to studying the three cases is appropriate, because institutional change often unfolds over long periods (Aldrich & Fiol, 1994; Anderson & Zeithaml, 1984; Tushman & Anderson, 1986). Our cases thereby encompass manifestations of public interest in favour of or opposed to new entrants as well as incumbents. We collected data not only on accounts of how new entrants employed public interest as a frame, but also on how regulators made use of public interest frames to combat or support market entry of three digital technologies. VoIP technologies enable the delivery of voice communications and multimedia sessions over the Internet. Cloud antenna technology picks up digital TV signals broadcast by the major TV networks via a tiny, individual antenna for each subscriber, and converts these signals into IP packets for transmission over the Internet. OTT technology is a media service offered directly to viewers via the Internet, thereby bypassing cable, broadcast, and satellite television platforms which traditionally control and distribute such content.

The three cases—VoIP, cloud antenna, and OTT—are appropriate for our research inquiry for four reasons. First, all three are disruptive digital technologies that provoked reactions from incumbents. Second, despite the fact that they are significantly distinguishable from each other, all are subject to the same regulator—the Federal Communications Commission (FCC)—which provides a more standardised setting for our analysis. Furthermore, the FCC is an established and strong regulator, which implies that new entrants are likely to have to engage in additional efforts to be accepted. Third, these technologies threatened to disrupt strong incumbents, which made the latter highly likely to respond. Fourth, our three

cases collectively span a long time period (1995–present), which allows us to document the repeated use of the public interest frame in varying political and cultural environments.

Our sources of data comprise of 452 newspaper and 190 academic (law journal) articles and 27 amicus curiae (friend of the court) reports, newsletters and communications from various industry actors. The large quantity of documents over the time period reflects the prevalence of publicly accessible communications in the broadcasting industry, and the documents themselves provide historical insight into the process. We used Factiva not only as a source to understand the rich case histories through newspaper articles, but also to identify amicus curiae reports filed in support of or in opposition to organizations behind disruptive technologies. An amicus report is an official report submitted by a third-party constituent who is not solicited by a party, but who offers information that has bearing on the case. While the decision on whether to admit the information lies at the discretion of the court, these reports are accurate signals of public interest because they are submitted by third-party constituents that are not part of either side of a court case.

In addition, newsletters and public communications of both new entrants and incumbents illustrate the logic and framing efforts of these key actors. We especially made use of the 89 public statements conceived at the 2003 FCC forum regarding the future of the VoIP technology, and 429 corporate statements of various companies involved with OTT technology. Articles from law and economics journals from this period also were key sources of information, as the public debate on regulatory issues around these disruptive technologies has captured the attention of academics and led to a series of academic articles analysing the situation from various angles. We used media sources both to uncover quotes and public statements that were missing from

our data and to substantiate our findings from actors' statements, rather than attempting to unearth the perspective of a third actor (i.e., media).

We analysed our cases through constant iteration between theory and data (Eisenhardt, 1989) to identify similarities and differences between existing empirical work and our cases, and to distinguish between existing and emergent theory. Data analysis involved three steps. In the first stage, we began identifying the key players and stakeholders associated with each technology and generated a chronology of events based on actions of these key players. The timelines for the three technologies are shown in Tables 1, 2, and 3. In the second stage, we converted these chronologies into a case history for each digital technology, detailing key company and regulator actions either supporting or opposing the technology. This stage of the analysis helped surface the prominence of different public interest frames in marshalling regulatory support. It also highlighted the role of the target 'public' for these frames. We coded a statement as a public interest statement when the statement explicitly used the words 'public interest', or when serving the public interest was implied by referring to societal benefits of the technology in question.

**Insert Tables 1, 2, and 3 about here**

During this process, we also identified different public interest frames that the actors used based on prior literature in law and public policy in communication and broadcasting technologies (Shelanski, 2006). We labelled a public interest argument as 'efficiency' based on when opponents or proponents of a given technology discussed the potential efficiency outcomes of this technology, i.e., the technology satisfies the consumer preferences as cost effectively as possible (Shelanski, 2006). We labelled a public interest argument as 'democratic' when opponents or proponents

of a given technology claimed that the technology contributed to a more fair and diverse society through equal access to technological innovations.

The efficiency model emphasises the idea that regulation should ensure that the public gets what it wants. The 'public interest' in this model equates to 'what interests the public'. In contrast, the democracy model desires to preserve citizens' opportunities to express and exchange varied ideas by giving them access to communication technologies (Shelanski, 2006). Finally, we labelled a public interest statement as 'advancement' when the proponents focussed on future benefits and more long-term implications of the technology rather than the short-term aspects.

As we coded these frames, we compared case histories and searched for patterns in their usage and their respective consequences. This step enabled us to refine our theorising regarding which public interest frames targeted at specific publics contributed to specific positive/negative outcomes regarding the digital technology (see Table 4 for supporting evidence for each frame). Observing common patterns replicating in the cases helped us develop more transferable insights (Yin, 2003). Our case comparison further enabled us to theorise the relative advantages and risks associated with the different public interest frames we identified. In the next section, we discuss how the concept of public interest was simultaneously used either to promote or restrict a specific digital technology.

**Insert Table 4 about here**

## FINDINGS

In this section, we chronologically compare the development of public interest frames during the market entry of three different technologies. The first part focuses on VoIP technology, followed by the cloud antenna and OTT technologies, respectively. Figure 1 depicts a visual model of our findings.

**Insert Figure 1 about here**

## Case 1: Voice over Internet Protocol

Our first case reveals how public interest was contested during a battle between entrepreneurial VoIP providers and incumbent analogue telecom operators beginning in the late 1990s and early 2000s. Users who communicate via analogue systems are assigned phone numbers and connected through a copper wire subscriber loop running from a central switch office to many homes and businesses. VoIP disrupted these systems by converting analogue phone signals into digital signals and transmitting them to personalised IP addresses via a secure network (FCC, 2005).

Accordingly, the emergence of VoIP technology in 1995 created a clear revenue threat for traditional telephone service providers. In 1996, America's Carriers Telecommunication Association (a trade association for incumbents in the telecommunications industry) filed a petition with the Federal Communications Commission (FCC), asking the agency to regulate VoIP providers. The association argued that VoIP companies were providing a telecommunications service and should be regulated using the same institutional framework as long-distance service providers. This would make VoIP companies subject to the same fees and access charges as the large telecom companies by removing them from the 'information services' category where there was no regulation. The FCC requested comments on the petition but never issued a decision. Despite this pressure from the industry, the FCC did not articulate any regulatory concerns about VoIP until it published its Report to Congress in 1998. In this report, the FCC tentatively concluded that VoIP was an information service, and stated that: 'VOIP providers do not offer a pure

transmission path; they combine computer processing, information provisioning, and other computer-mediated offerings with data transport.'

Continuing to demand tighter regulation after this decision, the incumbents used public interest framing to argue that VoIP companies should also pay Universal Service Fund fees. These are collected from telecommunications service providers to finance discounted telephone service to low-income persons, subsidise service in high-cost areas, and provide financial aid to schools, libraries, and healthcare organizations to access resources via the telecommunications network. The clearest link between public interest and universal service can be found in a statement issued by the Communications Workers of America (CWA), a union representing workers in the telecommunications industry:

> The current network of universal, affordable, high-quality telephone service—which reaches nearly every household and business in the United States—ensured that all Americans would have access to service through policies and regulation that served the public interest.

It continued with reference to the Universal Service Fund charge: 'Now, as we move into the next generation of communications, it is more important than ever to maintain this commitment to Universal Service, if the full benefits of Internet-enabled services are to be available to all.'

Similarly, OPASTCO, a national trade association representing over 550 small telecommunications carriers serving rural areas of the United States, complained in a forum organized by the FCC in 2003: 'A specific, predictable, and sufficient Universal Service Fund and equitable regulatory treatment of service providers are both necessary to guarantee that consumers in rural areas maintain ubiquitous, affordable access to a modern and reliable telecommunications infrastructure.'

Overall, incumbents opposed VoIP as a service, claiming that it harmed the public interest by promoting inequality. In turn, VoIP service providers (e.g., Deltathree, IceNet, ITXC, M5, USA Datanet, PointOne, Red Gap Communication, Callipso) and their association, the Voice on the Net (VON) Coalition, rejected this claim, arguing that VoIP technology provided economic benefits to society by reducing the overall costs of communication: 'If one of the goals of the Universal Service Fund is to provide affordable voice communications to rural America, then no technology offers more promise for providing more affordable communications, not only to rural America, but to all of America.'

VON and its members urged the FCC to classify VoIP and other IP-enabled services as 'information services' which is much less regulated than telecommunications services. The CEO of Callipso, one of the larger entrepreneurial VoIP services providers, argued that such a classification would enable VoIP companies to provide more access to the less privileged in society: 'By refraining from premature regulation of VoIP, its benefits will be available to those of low-and fixed-income, to the elderly, to immigrants, and to others who can access low-cost VoIP long-distance and international services only via dialled phone calls.'

Articulating a different argument, the executive vice president of PointOne stated that VoIP also would provide a platform for innovation:

> We are informing the FCC that with the right public policies, VoIP can help deliver new innovations and more affordable ways to communicate. VoIP also can be a force for increased competition, a platform for innovation, a driver of broadband deployment, and an enabler of economic growth.

This was a powerful argument, not only because it was framed in terms of increased efficiency, but also because it was more closely linked to economic growth and national competitive advantage. This last argument was publicly supported by some

influential supporters, such as well-known technology analyst Jeff Kagan, who famously declared: ‘Voice over IP is the technology of next century. This is the reinvention of the telecommunications industry. What we're facing right now is the beginnings of a brand new marketplace.’

These arguments shaped how regulators viewed VoIP. In his opening speech in the FCC forum, FCC chairman Michael Powell reflected on this digital technology and warned against over-regulation:

> Change produces anxiety for incumbents, for regulators, for politicians and for our citizens, who are confused by the dizzying array of new digital technologies, by the new services. We must resist the impulse to respond to this change by exporting old regulatory structures into the new IP space. VoIP and Skype are a testament to the fact that we have turned the corner on the digital migration.

FCC commissioner Copps was also on board, focusing on the significant transformative potential of this technology, and emphasising its novelty:

> We know that VoIP technology means huge changes in the mechanics of how we communicate. It may confer a universal language for communications, whatever the device—phones, laptops, personal digital assistants, you name it. So we all marvel at the transformative potential of new IP services. They sizzle with possibility for consumers and businesses alike.

Copps also signified the need for the FCC to be more visionary: ‘Sure we have to work with the system we have and implement the laws we have as best we can, but the Commission also has an obligation, I believe, to think larger thoughts.’

As the discourse about the potential of this digital technology became prominent, the FCC allowed VoIP to grow without strict regulation for the most part, and did not apply the older institutional regime that regulated the telecommunications industry. Although regulation was requested in 2004, the FCC never made a blanket decision regarding how to classify VoIP services throughout the 2000s, and VoIP

continued to grow. By 2013, 25% of U.S. households were using VoIP instead of landlines.

The VoIP case reveals how new entrants and incumbents battled using public interest arguments with respect to this new digital technology, and how the FCC was instrumental in co-constituting the dominant frame. Facing formidable opposition by incumbents, new entrants successfully used efficiency and democracy frames together with a forward-looking advancement frame to marshal the much-needed regulatory support that allowed them to survive and gain a foothold in the market.

**Case 2: Cloud Antenna**

The public interest frame also played a central role in the market entry of cloud antenna technology. Although other companies (e.g., FilmOn) used cloud antenna technology in similar ways and faced similar resistance[2], we illustrate our arguments by presenting a case study of Aereo, the most publicly visible company that became synonymous with cloud antenna technology. Founded in February 2012 with $20.5 million in financing, Aereo described itself as 'potentially transformative'. The company built 'antenna farms' with thousands of dime-sized antennas linked to cloud storage to provide broadcast television to subscribers over the Internet for a monthly fee. To watch a channel, Aereo subscribers sent a signal to Aereo's facility, and 'rented an antenna'. While there was no technological reason for each subscriber to have an individual antenna in order to watch programming, this arrangement made Aereo's service compliant with legislation. Otherwise, retransmitting television over-

[2] FilmOn, the other visible case of cloud antenna technology, faced lawsuits in 2012 and 2015 and lost both of them. At times, FilmOn and Aereo fought incumbents together and filed amicus briefs in support of each other's court battles.

the-air without a license (like those paid by cable or satellite television companies) would violate the 1976 Copyright Act. Instead, with a single antenna assigned to each subscriber, transmission ceased to be understood as 'public'.

Predictably, soon after it began operations, Aereo was sued by broadcasting networks and cable TV stations whose revenues were threatened by the new technology. Less than two weeks after its launch, Aereo was sued by major media companies for alleged copyright infringement and unfair competition. The broadcasters argued in court that Aereo provided 'the same service that cable companies have traditionally provided' and should therefore pay retransmission fees just like cable companies.

As with the previous case, the public debate quickly centred on what was in the public interest. On the one hand, industry incumbents like Cablevision, CBS, and Disney argued that creative content could only flourish if protected and incentivised. Gordon Smith, the President of National Association of Broadcasters, urged regulators to 'stand with free and local television'. In an amicus brief[3] submitted by the American Broadcasters, the incumbents stated:

> The copyright law is designed to protect and reward the investments in new and developing legitimate technologies that are particularly vital to the creative industries in the digital age, which benefit the public as a whole. Conversely, giving a benefit to a niche industry focused on parasitic technology, which benefits the few, is anathema to the goals underlying copyright law.

As evident in the quote above, the incumbents not only made a statement supporting the older institutional rule governing the industry (i.e., the copyright law),

[3] See https://www.americanbar.org/content/dam/aba/publications/supreme_court_preview/briefs-v3/13-461_pet_amcu_cavp.authcheckdam.pdf for the full brief.

but also made an argument based on inequality, stating that Aereo's technology benefits only a few rather than the public as a whole.

On the other hand, Aereo defended itself with a freedom of choice argument, arguing that their service was legitimate: it was any person's right to put an antenna on their mobile device just like would on their roof. In a press release, Aereo's CEO stated: 'Aereo believes it should be no more liable for copyright infringement than RadioShack was for selling an antenna to an American family 20 years ago.'

In an open letter titled 'Standing up for technology, innovation, and progress', Aereo's CEO stated:

> The broadcasters asked the Court to deny you, the consumer, the ability to use the cloud to access a more modern-day television antenna and DVR … We think you should be able to decide whether you use home equipment or whether you take advantage of the ease, convenience and lower cost of cloud-based equipment and storage.

From the beginning, the public interest argument made by Aereo was quite a complex one. It was not only based on freedom of choice, individual liberty, and cost savings, but also access to new technology. Aereo set up an advocacy website, 'Protect My Antenna', where they called consumers to action. Consumer groups indeed joined Aereo's appeal to 'give consumers the choice for cheaper programming':

> Consumer access to free-to-air broadcast television is an essential part of our country's fabric. Using an antenna to access free-to-air broadcast television is still meaningful for more than 60 million Americans across the United States. And when new technology enables consumers to use a smarter, easier to use antenna, consumers and the marketplace win. Free-to-air broadcast television should not be available only to those who can afford to pay for the cable or satellite bundle.

Other digital rights groups such as Public Knowledge and the Electronic Frontier Foundation also blamed incumbents for not giving consumers access to free over-the-air TV, articulating similar arguments in an amicus curiae brief:

> For a variety of technological and economic reasons, incumbent broadcasters are not serving the needs of consumers who want access to their programming. Broadcasters could build networks of repeaters to expand free access to their programming and reach consumers in 'digitally dead' zones. But broadcasters' reliance on retransmission consent payments from cable and satellite operators gives them a disincentive to expand free over-the-air access.

When the issue of copyright infringement went to the Supreme Court in 2014, Aereo widened its appeal, arguing that this case was not just about their specific technology, but about protecting the future of cloud technology. Rather than a champion for consumers, Aereo positioned itself as a champion of the economy:

> What is at stake in this case is much bigger than Aereo. The broadcasters' positions in this case, if sustained, would impair cloud innovation and threaten the myriad benefits to individuals, companies, and the economy at large of the advances in cloud computing and cloud storage.

However, the incumbents challenged the claim that Aereo was an innovative technology, as they detailed in an amicus curiae report: 'The opportunity to view programming through a shared antenna is not innovative and does not add consumer value'. In the same report, incumbents also challenged Aereo's claim that the company's case would have an impact on cloud technology: 'One can see that to argue that Aereo could affect cloud computing as a whole is an exaggerated argument that confuses the technology'.

Similarly, the Supreme Court refuted Aereo's claims about its own impact on the future of the cloud technology, ruling that the company's arguments were insufficient to prove that using micro antennae to provide access to content was a technological advancement. The statement issued by the Supreme Court states: 'This case should have little impact on cloud computing or other new technologies since Aereo is trying to design a system seemingly only for the purpose of evading copyright payment'.

Ultimately, the U.S. Supreme Court ruling came down to applying a pre-existing industry classification to Aereo that was subject to the older institutional framework. An industry analyst commented: ‘Is Aereo like a rooftop antenna for individuals or is it like a cable company?’ In June 2014, the Supreme Court ruled that Aereo was subject to the same regulations as cable companies. This decision kept the current broadcasting institutional framework intact, and placed a huge strain on the company’s resources. Aereo eventually had to file for bankruptcy, and ceased operations later that year.

This case reveals a shift in public sentiment, from supporting Aereo to turning against Aereo. For instance, during Aereo’s first two years of operations, 10 amicus briefs were filed in favour of the company and Aereo enjoyed several court victories (e.g., in the U.S. District Court in New York). However, during Aereo’s last three months of operations, the tide changed, and 17 amicus reports were filed against the company, one of which was drafted by the U.S. Justice Department.

In terms of appeals to the public interest, an interesting aspect of this case is the shift in Aereo’s rhetoric. From February 2012 to June 2014, Aereo’s framing strategy transformed from positioning the company as a Robin Hood figure for consumers to champions of the overall economy, but the latter was arguably out of sync with the way Aereo was perceived by the public. Aereo’s technology ultimately did not serve the general public; it served individual customers. The case of Aereo again shows how the public interest frame was used both by market entrants and incumbents, and how it was interpreted by the courts. Despite its ultimate defeat, the market entrant was able to garner support and resist unfavourable regulatory conditions by emphasising the freedom and advancement aspects of the public interest frame in the early phase.

**Case 3: Over-the-Top Technologies**

Our findings are also comparable to the contemporary case of net neutrality, which concerns OTT technology providers. OTT technologies stream digital content directly to viewers through Internet service providers. Advancements in Internet speed have enabled digital streaming to proliferate, thereby bypassing cable, broadcast, and satellite television platforms.

The rise of OTT technology has sparked a new regulatory debate around net neutrality, which is about regulating Internet service providers (e.g., AT&T, Comcast) such that they treat all digital content flowing through their systems equally, rather than moving some content into 'fast lanes' and blocking or discriminating against other material. In other words, net neutrality suggests that Internet service providers should not be allowed to slow down OTT providers such as Netflix, YouTube, or Hulu while prioritising their own streaming services, in which they had invested significant resources (e.g., AT&T bought Time Warner, Comcast unsuccessfully bid for 21st Century Fox before launching its own service called Peacock, and Verizon launched Go90 streaming). In the case of OTT versus Internet providers, we see a slightly different type of incumbency compared to the other cases. Platforms such as Netflix and Hulu began offering content streaming services sooner than incumbent Internet providers. In other words, the reason for the resistance was that OTT providers disrupted incumbents' future revenues, as opposed to current revenues.

When we look at the evolution of this debate, we observe that net neutrality advocates—typically, digital content providers such as Netflix, YouTube, and Facebook, as well as civic technology groups—called for the regulation of Internet

service providers, arguing that ‘keeping the Internet an open playing field is crucial for innovation’ and will preserve the public interest: ‘If broadband providers pick favourites online, new companies and technologies might never have the chance to grow’ (Finley, 2020). Presenting a retrospective argument, net neutrality advocates argued that if Internet providers had blocked or severely limited video streaming in the mid-2000s, major innovators might not have emerged. The President of Public Knowledge, which advocates for consumer rights on digital issues stated:

> You can’t have innovation if all the big companies get the fast lane … Look at Google, eBay, Yahoo—none of those companies would have survived if 15 years ago we had a fast lane and a slow lane on the Internet.

As illustrated by the quote above, without net neutrality, a broadband provider could allow companies to pay for priority treatment on broadband networks. The fear was that, over time, companies and organizations that either could not afford priority treatment, or simply were not offered access to it, would cease to exist. In sum, their argument was based on the belief that keeping the Internet neutral ‘democratised’ the Internet, offering equal access for new technologies and organizations, and thus, serving the public interest. A relatively small Internet browser, Mozilla, stated: ‘It is imperative that all Internet traffic be treated equally, without discrimination against content or type of traffic—that’s the how the Internet was built and what has made it one of the greatest inventions of all time.’

Similar arguments were made by other interest groups, such as Freepress:

> Net Neutrality is crucial for small-business owners, startups and entrepreneurs, who rely on the open Internet to launch their enterprises, create markets, advertise their products and services, and reach customers. We need the open Internet to foster job growth, competition and innovation. It’s thanks to Net Neutrality that small businesses and entrepreneurs have been able to thrive online. But without Net Neutrality, ISPs can exploit their gatekeeper position and destroy the Internet’s fair and level playing field.

Reflecting similar sentiments, Mike Masnick, president of Copia Institute, said:

> Giant gatekeepers, like Verizon and AT&T, which are now controlling Internet access, are in a position to pick winners and losers. Since some websites are willing to pay them more money, the gatekeepers will let those sites work faster and better.

Net neutrality advocates also highlighted that net neutrality would promote diversity in opinions and free expression: a few large telecommunications companies dominate the broadband market, which grants them extensive power to suppress particular views or only protect online speech for those who can pay the most. To prove this point, 150 technology companies, including Facebook, Amazon, Google, Microsoft, Dropbox and eBay, signed and sent the following letter to the FCC and petitioned for the protection of net neutrality: 'This Commission should take the necessary steps to ensure that the Internet remains an open platform for speech and commerce so that America continues to lead the world in technology markets.'

In the other camp of the net neutrality debate were Internet service providers such as Verizon and AT&T, who warned against over-regulation and argued that insisting on strong net neutrality protections would discourage broadband investment, with negative repercussions for residents in rural areas which lack the necessary infrastructure for broadband Internet access. Linking their public interest frame to the notion of efficiency, they argued that slowing these infrastructure investments would prevent them from providing better, faster, and cheaper Internet access to American consumers. ISPs also mobilised to oppose net neutrality. A letter to the FCC signed by 19 municipal ISPs stated:

> By returning to light-touch regulation of broadband service, the Commission will give Municipal ISPs incentives to invest in enhancing our networks and our deployment of innovative services at affordable prices while still ensuring consumers have unfettered access to the Internet.

Facing these two opposing camps, the FCC initially chose to enforce net neutrality protections. After a series of legal defeats at the hands of broadband

providers, the FCC passed a sweeping net neutrality order in 2015. The FCC's decision rested on the innovation argument. FCC chairman Wheeler elaborated: 'We cannot possibly imagine what is going to happen next on the Internet. We want to encourage that sort of innovation ... The Internet must remain open, we will protect the Internet.'

However, in December 2017, the Republican-controlled FCC voted to reverse that order, freeing broadband providers to block or throttle content as they see fit unless Congress or the courts block the decision. This decision led to a stark reaction from net neutrality supporters, bringing back the innovation argument. Netflix stated:

> We're disappointed in the decision to gut Net Neutrality protections that ushered in an unprecedented era of innovation, creativity & civic engagement. This is the beginning of a longer legal battle. Netflix stands w/ innovators, large & small, to oppose this misguided FCC order.

As we wrote this paper, several U.S. states were taking up the fight for net neutrality by opposing the FCC's decision and reinstating the previous institutional regime. The state of Washington became the first to pass its own net neutrality laws in March 2018, and California, and Oregon, Vermont followed suit. As of 2020, 21 more states had pending legislation on the matter. The debate and fight over the final institutional framework to govern the digital content and infrastructure continues, and may last many more years.

The case of OTT technology demonstrates how providers of new digital services and incumbents whose market positions were threatened used various public interest frames to bolster their positions, and how the regulator played an active role by subscribing to its own version of the story. Facing formidable opposition by incumbents, disruptors successfully combined democracy frames with a forward-looking advancement frame to marshal much-needed regulatory support that allowed

them to construct and protect the net neutrality institutional framework. Incumbents mostly utilised an efficiency frame, and experienced an initial defeat, followed by a temporary win under a new political regime. The final verdict has yet to be determined.

By focusing on the evolution of framing and positions by not only disruptors and incumbents, but also regulators throughout the three cases, we were able to observe how regulators do not merely function as passive audiences to strategic framing by market actors, but actively co-create institutional contexts, as predicted by communicative institutionalism. In the next section, we compare and contrast our three cases and discuss our theoretical contributions.

## DISCUSSION

New technologies are associated with transforming existing institutional spaces or creating new ones (Dosi, 1982; Rosenberg, 1982; Van de Ven & Garud, 1994). In particular, the transformational influence of digital technologies on existing institutional settings is even more pronounced due to potential inadequacies and voids in these settings (Gurses & Ozcan, 2015), and the potentially seismic nature of transformation associated with digital technologies (Ozcan & Yakis-Douglas, 2020, Skog et al., 2018). Because regulators still operate with time horizons spanning just under a decade, it can take a long time for digital technologies to gain legitimacy. Thus, digital disruptors may need to operate in ‘grey spaces’ where they experiment with new business models and frame strategies in order to expedite this process and influence policy making to their benefit (Hinings et al., 2018: 6). This context is at the very heart of our study.

Our comparative analysis of three digital technologies illustrates that public

interest is a construct that is constantly redefined by the deliberate and discretionary frames employed by both disruptors and incumbents, as well as regulators' interpretations of them. Our findings emphasise a view of public interest that is *equivocal* (Daft & Weick, 1984), with competing conceptions of whether a new technology is good for society, not unlike recent examples discussed by Townsend et al. (2018), such as cloud computing (Armbrust et al., 2010), cyber-security (Byres & Lowe, 2004; Choo, 2011) or nano technologies (Baird, Nordmann, & Schummer, 2004).

While we are not the first to draw attention to the relationship between publicly oriented bodies of actors and technologies, we are among the first to delve into how digital disrupters *and* incumbents can use frames based on public interest in attempts to establish a more favourable institutional environment, and how, as a result, public interest can be defined in multiple ways by regulators and market players, and evolve over time. To our first point, our data reveals that, first, organizations in the early stages of introducing digital technologies may be able to alter the institutional context in ways that will enable their technology to be accepted if they successfully construct frames with broad public appeal. Second, these organizations often complement their arguments that their technology increases *efficiency* and supports *democracy* with claims that it provides *technological advancement* to society. Finally, we find that organizations that face retaliation from incumbents in the form of public interest frames seem to be more successful if they convincingly argue that their time horizon is not only the present, but also the *future*. We discuss these findings below.

**Broad Public Appeal**

In the context of digital technologies, public interest arguments aimed at

shaping the institutional environment may embrace different conceptualisations of the term ‘public’, as demonstrated in studies on how communities influence their institutional environments (e.g., Aldrich & Whetten, 1981; Astley, 1985; Astley & Fombrun, 1987; Barnett & Carroll, 1987; DiMaggio, 1988; Freeman & Barley, 1990; McKelvey, 1982; McKelvey & Aldrich, 1983; Van de Ven & Garud, 1989, 1994). Our findings illustrate that similar to communities, firms can decide how to interpret what constitutes the ‘public’ and successfully employ public interest arguments to change the institutional environment.

We found that the public interest frames employed by VoIP firms spanned a broader public rather than a narrow segment. The public was not just anyone with a landline, but also anyone with a computer and modem. Cloud antenna companies, on the other hand, failed to convince regulators that their technology would benefit users because of their narrow construction of public interest. Indeed, while Aereo argued that free-to-air broadcast television should be available to everyone, it was clear that the right to view broadcasted content for free belonged only to those who had the technology on their mobile devices rather than every member of the public. In the case of OTT technologies, the number of companies that got involved was much higher, and they delivered content to a large number of end-users whom they could tap into for support. Having these advantages already in place, when OTT technology companies made the argument that Internet should be ‘open and neutral’, it was fairly easy to broaden their appeal to the general public and garner support. This broadening is in line with what Gray, Purdy, and Ansari (2015) described as critical in amplifying the appeal of a given frame. The authors argued that the broadening of actors’ networks is associated with the transfer of meaning among these actors and that amplification takes place when these meanings become widely held. The more

diverse the actors, the wider the frame's dissemination is likely to be. The amplification effect of appealing to a *broader* public is likely to help get regulators on board, as their raison d'être is to preserve the interest of the general public (Pigou, 2013).

A new digital technology can have uncertain consequences and often lacks an established market (Teece, 2018), whereas incumbents' technologies typically are embedded and have a wide reach. This gives established players a rhetorical advantage in employing the concept of 'public' much more broadly, and in line with the notion of society. We find that in cases where both producers of disruptive digital technologies and incumbents use public interest frames that appeal to broader society, claims that the disruptive technology provides not only technological advancement to society, but also diversity and plurality (democracy frame) and/or a more efficient economy (efficiency frame) seem to resonate with regulators. We expand on these in the next section.

**Combining the Three Types of Public Interest Frames**

All the three cases demonstrate that a framing of technological advancement resonates with regulators. Our analysis illustrates that VoIP companies' public interest frames were also explicitly anchored in market norms (i.e., economic growth, speed) and hence reflected the efficiency argument defined in terms of 'fostering a market that does the best possible job of satisfying consumers' preferences' (Shelanski, 2006, p. 383). The efficiency argument focuses on satisfying a multitude of individual desires, whereas the democracy argument emphasises improvement in the quality and diversity of information available to influence civic participation. VoIP companies successfully framed their technology as not simply establishing competitive

advantages in the marketplace or improving how the existing market functioned; but also creating space for new marketplaces. This helped them situate their case within a broader, civic category of national competitive advantage. VoIP providers were thus able to combine the efficiency argument of public interest with the broader argument of societal advancement, going beyond the narrower definition of consumers as their main public, and presenting themselves as facilitating economic growth for the entire nation. In Table 5, we compare these three types of public interest frames.

**Insert Table 5 about here**

In contrast, cloud antenna companies employed public interest arguments with little to no success. They adopted the democracy argument by emphasising diversity and plurality in society and the need to provide individuals with access to technologies that enable them to communicate their ideas and advocate for their interests (Shelanski, 2006). They argued that democratising viewership of broadcasting content involved mobile access, but their claims were unconvincing. Aereo also adopted an efficiency argument, claiming that it was in the public interest to help customers avoid paying high subscription fees to cable companies. However, Aereo could substantiate its efficiency claims only for a narrow segment of the public. Later, when the company tried to position its technology as key to the advancement of cloud technology, regulators embraced incumbents' arguments that these efforts constituted a threat to the public interest through copyright infringement. The cloud antenna case shows how opposing sides can draw on public interest to advance goals that are in complete conflict with each other.

Finally, OTT technology companies combined the democracy and advancement arguments, whereas the opposition typically constructed arguments rooted exclusively in efficiency arguments. OTT technology companies argued that keeping the Internet

neutral ‘democratised’ it, offering equal access to new technologies and organizations, and emphasised that net neutrality would enable the country to maintain its position as a global technology leader. Blending these arguments paved the way for establishing strong net neutrality rules, which were reversed due to a political regime change, but subsequently gained traction at the state level.

**Present and Future Temporal Focus**

Finally, we turn our attention to temporal focus. In addition to combining the three types of public interest frames, new entrants in the VoIP and OTT technology markets garnered support at least partly by appealing to regulators’ temporal focus, i.e., the extent to which individuals, groups, and organizations typically direct their attention to the past, present, and/or future (Bluedorn, 2002; Shipp, Edwards, & Lambert, 2009; Zimbardo & Boyd, 2015). Individuals with a strong present focus emphasise the current time frame in decision-making (Kunisch, Bartunek, Mueller, & Huy, 2017) whereas those with a strong future focus envision and consider future events when making decisions (Bluedorn, 2002).

In a growing number of recent studies, scholars have focused primarily on temporality in organization theory and strategy, elaborating on, among other things, how time is experienced and socially organized (see for example, Granqvist & Gustafsson, 2016; Kaplan & Orlikowski, 2013; Reinecke & Ansari, 2015; Reinecke, Suddaby, Langley, & Tsoukas, 2020). These studies constitute a major shift away from research in which scholars frame findings and/or specific phenomena as being independent of time (Hassard, 1990; Roe, Gockel, & Meyer, 2012) (see Brunelle, 2017 for a detailed literature review and analysis on temporality in organization studies). Scholars have suggested that temporality is at the very heart of organizing

and that as organizations try to adapt to their changing environments, they create temporary organizing principles for both internal and external stakeholders (Bakker, 2010).

Discussing the strategic use of temporal focus, Strobel, Tumasjan, Spörrl, and Welpe (2013) suggested that appealing to a present temporal focus might lead people to emphasise immediate, short-term, proximal goals, which are likely to motivate people because they enable them to evaluate the situation with current goals in mind (Bandura, 1991). In a similar vein, Karniol and Ross (1996) suggested that a future temporal focus may energise goals by helping people imagine various futures and pursue the most desirable ones.

For the three technologies we examined, we observed that the companies' framing strategies involved a temporal dimension, ranging from an efficiency focus to improve the present, such as offering a communication device that was less expensive than current market solutions, to an appeal to the regulator's future goals of creating a more connected and technologically advanced society. Whereas industry incumbents remained focused on the present in their democracy, efficiency and (lack of) advancement frames, successful new entrants appealed to *both* the present and future temporal focus of regulators (Figure 1). This helped them not only showcase better solutions to the problems at hand, but also establish links between current realities and future possibilities. By constructing a 'what if' scenario, they invited regulators to imagine both the significance of new ideas for society and how they might come to fruition (Bartel & Garud, 2009). We observed how this temporal framing enabled regulators to perceive the viability of new technologies and the firms' plans to realise them. By articulating compelling visions of the future (Venus, Stam & Van

Knippenberg, 2019), disruptors engaged in 'future-making' (Wenzel, Krämer, & Reckwitz, 2020) while remaining responsive to present needs.

By identifying the efficiency, democracy, and technological advancement frames and temporal focus (present *and* future) as pillars of successful public interest framing, we contribute to extant literature in sociology and public policy. Social movement and public opinion studies have shown that framing significantly influences public opinion (Benford & Snow, 2000; Chong et al. 2007; Goffman, 1974). Scholars have shown that image-provoking, emotionally-compelling frames with negative information are especially effective for changing people's minds (e.g., Valentino et al., 2013, Jerit & Barabas, 2006). More broadly, scholars (e.g., Feinberg & Willer, 2015) have suggested that frames related to the moral values of the opposition can be effective. International relations scholars have similarly argued that in politics, any issue can be presented with a security frame, which if dramatised and connected to claims about existential threats and crises (Balzacq, 2010; Buzan et al., 1998), can justify extraordinary measures. We contribute to this broad and interdisciplinary field of study on frames and their effectiveness by unpacking framing combinations that are particularly influential in regulatory decision-making on new technologies.

## CONCLUSION

Scholars have shown increasing interest in understanding the role of contemporary digital technologies in institutional disruption (Hinings, Gegenhuber, & Greenwood, 2018). Disruptive digital technologies such as the three we investigated have the capacity to threaten incumbents' competitive positions and transform markets and societies on a grand scale. Our findings show that in such cases, perhaps

more importantly than competitive strategy, the frames adopted by disruptors and incumbents and the resulting framing contests with the active involvement of regulators will help shape regulatory regimes. Based on our findings, we argue that digital technologies alone do not inevitably lead to institutional change. Institutional outcomes are determined, at least in part, by the effective use of public interest frames and regulators' reactions to them.

Our findings also reveal which aspects of these public interest frames are likely to be associated with potential institutional change. Successful disruptors frame digital technologies to appeal to a broader (as opposed to a narrow) segment of the public, complement their efficiency or democracy claims with claims of technological advancement, and finally, promote advancement in public life in both the present *and* the future.

Our research thus illustrates that public interest is not a static concept, and is open to interpretation and manipulation, particularly when new technologies create uncertainty and call regulators to action. By demonstrating how public interest was simultaneously used by stakeholders with opposing perspectives to either promote or restrict digital technologies, our findings emphasise the need for regulators to define public interest in a more robust way within the digital technology context. Otherwise, public interest may manifest itself through its equivocality, leading to multiple interpretations, which are either mutually exclusive or in conflict. The framing actions used by these actors and the persuasiveness of these frames in fostering support among regulators and legislators would then determine the path of institutional change and which actors will benefit.

Our knowledge of institutional change brought about by digital technologies can be expanded by future research by shedding more light on the public interest

frames of different actors. We believe that public interest frames could be more effective for mobilisation when they target a larger number of actors, although some types of actors may matter more than others. Thus, scholars can help fine-tune which types of actors should be targeted in public interest framing attempts in order to achieve field-level mobilisation. In addition, future studies in other settings involving other digital technologies and new (e.g., platform) business models can help create a more robust account of public interest and make it 'future proof'. Given current debates over the regulation of digital platforms (e.g., Airbnb, Facebook, Google, Uber) which have revealed equivocality regarding public interest, our study provides timely insights, both from a scholarly and a regulatory perspective, and a fruitful avenue of investigation for the future.

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**TABLE 1**

**VoIP chronology of events**

| Year | Event |
|---|---|
| 1995 | First VoIP company, Vocaltec, emerges |
| 1996 | First petition of landline firms to regulate VoIP |
| 1998 | FCC issues Report to Congress and classifies VoIP as information service |
| 2003 | FCC forum, where both parties state their positions regarding VoIP |
| 2004 | FCC asks for clarification on how to classify VoIP but does not issue a final decision |
| 2013 | 25% market penetration, no final classification of VoIP yet |

**TABLE 2**
**Cloud antenna chronology of events**

| Year | Event |
|---|---|
| February 2012 | Aereo is founded |
| March 2012 | Broadcasters sue Aereo immediately |
| July 2012 | Second District of New York Court rules in favour of Aereo |
| October 2013 | Boston Court rules in favour of Aereo |
| February 2014 | Utah court rules against Aereo and shuts it down in 6 states |
| June 2014 | Supreme Court rules against Aereo |
| November 2014 | Aereo ceases operations |

**TABLE 3**
**OTT technology chronology of events**

| Year | Event |
|---|---|
| January 2010 | The FCC receives more than 100,000 comments on its proposed net neutrality rules |
| December 2010 | The FCC creates Open Internet rules and prohibits blocking and unreasonable discrimination to protect Internet openness |
| January 2014 | Courts vacate significant parts of the Open Internet Order |
| May 2014 | 150 technology companies send a letter to the FCC asking for stronger net neutrality rules |
| September 2014 | The FCC receives 3.7 million comments on its proposed net neutrality rules |
| February 2014 | The FCC passes the Title II net neutrality rules, decides for strong net neutrality |
| May 2017 | The new FCC committee starts rolling back net neutrality regulations |
| July 2017 | Many companies and the original founder of the Web, Tim Berners-Lee participate in net neutrality 'day of action' |
| December 2017 | The FCC officially reverses net neutrality regulations |
| September 2018 | California passes regulations for net neutrality protections |
| June 2019 | Maine governor signs net neutrality bill |

**TABLE 4**
**Different uses of the public interest concept**

| Start-ups | | | | Incumbents/regulators | | | |
|---|---|---|---|---|---|---|---|
| Technology | Public interest frames | Public interest frame content | Sample quotes | Actor | Public interest frames | Arguments regarding start-ups' public interest frames | Sample quotes |
| VoIP | Technological advancement | Revolutionary technology | 'Exemption from (Universal Service Fund fees) will mean, allowing a revolutionary technology to grow' | Incumbents | Democracy | *Con:* Exemption from Universal Service Fund fees will deteriorate the access of low-income persons to discounted telephone service due to lower subsidies and financing. | 'The current network of universal, affordable, high-quality telephone service—which reaches nearly every household and business in the United States—ensured that all Americans would have access to service through policies and regulation that served the public interest. Now, as we move into the next generation of communications, it is more important than ever to maintain this commitment to universal service, if the full benefits of Internet-enabled services are to be available to all.' |
| | Efficiency | Affordable communication for the public | 'We are informing the FCC that with the right public policies, VoIP can help deliver new innovations and more affordable ways to communicate. VoIP also can be a force for increased competition, a platform for innovation, a driver of broadband deployment, and an enabler of economic growth.' | Regulators | Efficiency | *Pro:* More competition will improve market efficiency | 'If you're a big incumbent and you've sort of enjoyed a competitive advantage … you, in my opinion, ought to be terrified.' |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | Regulators | Technological advancement | *Pro:* Revolutionary technology | 'We know that VOIP technology means huge changes in the mechanics of how we communicate. It may confer a universal language for communications, whatever the device—phones, laptops, personal digital assistants, you name it. So we all marvel at the transformative potential of new IP services. They sizzle with possibility for consumers and businesses alike.' |
| Cloud antenna | Initially: Democracy | Free-to-air broadcast television should be available to everyone | 'Free-to-air broadcast television should not be available only to those who can afford to pay for the cable or satellite bundle' | Incumbents | Initially: Democracy | *Con:* Enforcing copyright law benefits the public as a whole | 'The copyright law is designed to protect and reward the investments in new and developing legitimate technologies that are particularly vital to the creative industries in the digital age, which benefit the public as a whole. Conversely, giving a benefit to a niche industry focused on parasitic technology, which benefits the few, is anathema to the goals underlying copyright law.' |
| | Initially: Efficiency | Cloud-based equipment and storage has lower costs | 'We think you should be able to decide whether you use home equipment or whether you take advantage of the ease, convenience and lower cost of cloud-based equipment and storage' | Incumbents | Later: Technological advancement | *Con:* Not really innovative | 'The opportunity to view programming through a shared antenna is not innovative and does not add consumer value' |
| | | | | | | *Con:* No real impact on cloud technology | 'One can see that to argue that Aereo could affect cloud computing as a whole is an exaggerated argument that confuses the technology.' |
| | Later: Technological advancement | Aereo as champion of the economy | 'What is at stake in this case is much bigger than Aereo. The broadcasters' positions in this | Courts | Technological advancement | *Con:* No real impact on cloud | 'This case should have little impact on cloud computing or other new technologies' |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | case, if sustained, would impair cloud innovation and threaten the myriad benefits to individuals, companies, and the economy at large of the advances in cloud computing and cloud storage' | | | technology | |
| OTT technologies | Democracy | All data should be treated equally | 'It is imperative that all Internet traffic be treated equally, without discrimination against content or type of traffic — that's the how the Internet was built and what has made it one of the greatest inventions of all time' | Incumbents | Efficiency | *Con:* Affordable Internet | 'By returning to light-touch regulation of broadband service, the Commission will give Municipal ISPs incentives to invest in enhancing our networks and our deployment of innovative services at affordable prices while still ensuring consumers have unfettered access to the Internet.' |
| | Technological advancement | | 'This Commission should take the necessary steps to ensure that the Internet remains an open platform for speech and commerce so that America continues to lead the world in technology markets' | | | | |

**TABLE 5**
**Different types of public interest frames**

| Dimension | Democracy frame | Efficiency frame | Advancement frame |
|---|---|---|---|
| Public interest benefit | Promoting diversity, giving access to more people | Efficiency and market norms | Radical innovation and disruption benefitting all members of society |
| Temporal focus | Present | Present | Future |

**FIGURE 1**
**Public interest frames in evaluating disruptive digital technologies**