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Who owns the airwaves? How disruptive communication technologies enter established markets through public interest framing

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Abstract
Using a multi-case, longitudinal analysis of three disruptive communication technologies: Cable TV, Voice over Internet Protocol, and Cloud Antenna, we explore how stakeholders use public interest frames to gain market power. More specifically, we discover and investigate further the concept of “public interest” and how innovators – each with opposing perspectives – appealed to public interest either to promote or to restrict regulation. Our case analyses expose contradictions, commonalities and tensions in these appeals. We introduce a critical evaluation of these case studies to convey public interest as a way in which disruptive technologies enter and penetrate markets with established incumbents and powerful regulators. In doing so, we call for developing a theoretically robust account of public interest, framed in the emerging technology context.
Who owns the airwaves?

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ABSTRACT

Using a multi-case, longitudinal analysis of three disruptive communication technologies: Cable TV, Voice over Internet Protocol, and Cloud Antenna, we explore how stakeholders use public interest frames to gain market power. More specifically, we discover and investigate further the concept of “public interest” and how innovators—each with opposing perspectives—appealed to public interest either to promote or to restrict regulation. Our case analyses expose contradictions, commonalities and tensions in these appeals. We introduce a critical evaluation of these case studies to convey public interest as a way in which disruptive technologies enter and penetrate markets with established incumbents and powerful regulators. In doing so, we call for developing a theoretically robust account of public interest, framed in the emerging technology context.

Key words: Disruptive technologies; innovation; public interest; regulators
INTRODUCTION

Disruptive technologies are field changing innovations that radically change the rules of the game. Existing 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 cause uncertainty (Anderson and Tushman, 1990; Bower and Christensen, 1995; Hargadon and Douglas, 2001; Tushman and Anderson, 1986; Weick, 1990). In such circumstances, actors need to make sense of the situation before they can act (Weick, 1995). Earlier theoretical work highlights that in contexts associated with uncertainty and complexity, actors are typically only able to reflect on a limited range of issues (Kingdon, 1984) and often rely on heuristics and pre-existing beliefs and biases (Hilgartner & Bosk, 1988) to process the limited information available to them. Regulatory agencies, especially those confronted with innovation and technological advancements, are typically forced to deal with the unknown and are likely to be subject to various kinds of cognitive biases in the process (Thomas, Clark, & Gioia, 1993; Porac and Thomas, 2002).

In the wake of disruptive technology, therefore, both incumbents and new entrants are likely to try to influence institutional actors’ cognitive frames in ways that will strengthen their strategic positions. Market incumbents will most likely wish to keep the status quo, whereas new market entrants will want change that secures legitimacy for their products and services (Aldrich and Baker, 2001; Ingram and Rao, 2004). The uncertainty created by new technologies may also provide an opportunity for incumbents and new entrants with potentially disruptive technologies to influence regulators and the general public (Gurses & Ozcan, 2014). In doing so, both sets of
actors may appeal to public interest strategically to influence their institutional environment, and to obtain favourable outcomes.

Public interest is used as an overarching ethical criterion when considering whether something benefits wider society (e.g. Amao and Amaeshi, 2008; Brown, 2006; Buchholz and Rosenthal, 2004; Carson, 2003; Detomasi, 2007; Fisher, Gunz and McCutcheon, 2001; Harrington, 1996; Jamal and Bowie, 1995; Johnson, 1986; L'Etang, 1994; Lewis, 2008; Roberts, 2003; Santos, 2012). However, despite being used so frequently, and despite being such a fundamental construct, public interest is also difficult to pin down. In some settings, Buchholz and Rosenthal identify that the appeal to public interest can potentially be "hollow", with the danger being that, it is, "a claim that has no clear meaning and cannot be challenged by the public whose interests are at stake" (Buchholz and Rosenthal, 2004: 145). This flexibility means public interest can simultaneously be invoked by parties on two opposing sides of a debate.

In this paper, we deal with public interest as an artefact resulting from the deliberate and discretionary actions of organizational stakeholders and/or constituents. In other words, public interest is purposeful and manifested, and in our case used strategically by new entrants to gain competitive advantage or by incumbents to prevent disruptive technologies from gaining traction. While public interest is a fluid concept, it does lend itself to analysis. We investigate the public interest concept via a multi-case, longitudinal analysis within the broadcasting technology context using archival data. We examine three cases where disruptive technology initiated regulatory uncertainty, and gave rise to the strategic use of the public interest concept by various actors. First, we develop a theoretical account of public interest. Second, we ground this in an applied arena: broadcasting, and analyse the impact of disruptive technologies in this arena. Third, we analyze three case studies of disruptive technologies in these
arenas: Cable TV, Voice over Internet Protocol (VoIP) Communication, and Cloud Antenna. With our case analysis, we demonstrate how public interest was simultaneously used either to promote or to restrict licensing of these disruptive technologies by stakeholders or constituents with conflicting viewpoints. Fourth, we discuss how public interest arguments were used in distinct ways in the three cases and provide richer understanding of what "public" means (Marquand, 2004): by drawing a contrast between the citizen and the consumer.

Before we examine three cases where disruptive technology initiated regulatory uncertainty and gave rise to the strategic use of the public interest concept by various actors, we introduce the concept of public interest and discuss the role of public interest among disruptive technologies and regulators.

THEORETICAL BACKGROUND

Public interest

In industry and in civil society public interest is ever-present: it features in professional codes of ethics or conduct, in statements on corporate responsibility and sustainability, in considering the effects of government reform and legislation, and in public debates on new technologies and new markets (Amaeshi and Amao, 2009; Arnesen and Blizinsky, 1996; Goodman and Lovemen, 1990; Hird, 1990). Public interest is also considered a core, ‘indispensable’ (Morrell and Harrington-Buhay, 2012: 412) term in public administration; informing debates on the relationship between the citizen and the state (Cox, 1973; Shergold, 1997; Tullock, 1984).

However, it remains difficult to pin down the public interest. Over decades, different scholars repeatedly note the existence of different definitions of public interest based on multiple, sometimes incompatible conceptions (Morrell and Harrington-
Buhay, 2012; Perry and Rainey, 1988). Many scholars leave public interest undefined, which risks the concept being too malleable and fluid, but even attempts to define it do not necessarily result in precision. Indeed, Pickhardt (2005) explains how across time, public interest has been used to refer variously to: upholding a principle of justice; to the successful combination of efficiency and fairness by an administration; to a sense of community or togetherness to the benevolence of a governing elite; and to citizens' behaviour - both individually and collectively. Public interest is used as an evaluative criterion that can often refer to a specific course of action or the consequence of some change (Lewis, 2008), thus it can be used as a term to evaluate change. As we will illustrate in our cases, different public interest arguments may be used both by change agents and by proponents of the status quo. These tensions are particularly thrown into relief when looking at what are called disruptive communications technologies. These are theoretically interesting because they often occasion large, wide-spread change which affects many thousands, if not millions of members of the public; and because their effects usually happen in a very short timeframe. In these settings, the notion of public interest is key to understanding how rival stakeholders frame their arguments for change, or for the status quo. In this context, a key actor in evaluating and taking a position regarding the fate of a new technology is the regulator (Lanjouw and Ashoka, 1996). In the following section, we will ground our discussion of public interest in this particular context.

**Regulators, Disruptive Technologies and Public Interest**

Industry regulators, who are often the primary actors concerned with protecting the public interest, are routinely subject to attempts to influence them by opposing stakeholders. Since the normative role of regulation is to benefit society as a whole,
regulatory agencies very frequently frame accounts of their actions and recommendations in terms of serving the public interest (Pigou, 2013).

In the United States, for instance, the SEC officially protects the public interest in banking by ensuring that resources are allocated in a socially efficient manner (Misham, 1969), while in the food industry, the FDA protects the public interest by ensuring food safety (USFDA, 2008). The FCC, founded to regulate the broadcasting industry, has determined that the electromagnetic spectrum is a limited resource belonging to the public, and that only those most capable of serving the public interest will be permitted to have a broadcast license (Communication Act, 1934).

The received definition of an industry regulator is that it is an independent, state agency that acts as a referee to oversee market activity and the behaviour of private actors in the economy (OECD, 1995). In practice, the role of regulators such as the FCC is quite a complex one and they operate in politically contested settings. They are often subject to influence from their environment while working to regulate new products and services. In addition, regulators are often under the influence of legislators and judicial actors. For instance, when the regulator is acting against the legislator’s original intent, conflicts may arise, and the legislators may reduce the scope of the regulator’s discretion or even overturn its rulings through warnings, moratoriums and new legislation (Gabor, 2013; Gurses and Ozcan, 2015).

In addition to this politically complex environment, there can be various, additive complexities that come from the market. For example, market incumbents typically have strong connections to regulators due to mechanisms such as the “revolving door”, i.e. individuals passing between roles at legislators / regulators and the private organizations affected by the legislation and regulation (Eckert, 1981). Market incumbents may also act more strategically to preserve their status quo, portraying new
entrants as destructive or destabilizing for the market so that regulators ban these entrants (Aldrich and Baker, 2001; Derthick and Quirk, 1985; Ingram and Rao, 2004; Lawrence, 1999). One example of this is that incumbents in the airline industry succeeded in getting new airlines rejected when the latter requested interstate routes at the Civil Aeronautics Board (Derthick and Quirk, 1985). In a more recent study, Ingram and Rao (2004) showed how, despite their size disadvantage, independent grocery stores organized a social movement and achieved a temporary ban against supermarket chains entering the retail industry.

There are some generally interesting considerations when considering the role of regulators, but of particular interest is the context of disruptive technologies in communications, since these can induce large-scale change over a large mass of people in a short time-frame. Because, by its nature, such changes often outpace existing legislation and industry norms there can be a governance void. Received understandings of public interest may be more subject to change, since the moral framework for understanding the impact of new technologies is not established. Accordingly, when it comes to regulating new technologies, these uncertainties mean that the pressure and influence exerted by different industry actors may be felt even more strongly by regulators.

Prior literature shows that new technologies require a defined institutional space to govern the production, distribution and consumption of associated artifacts (Dosi, 1982; Rosenberg, 1982; Van de Ven & Garud, 1994). Until this is established, however, new technologies often cause uncertainty (Anderson and Tushman, 1990; Bower and Christensen, 1995; Hargadon and Douglas, 2001; Tushman and Anderson, 1986; Weick, 1990). In 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 may be subject to various kinds of cognitive biases in the process. Earlier theoretical work highlights that political actors are typically only able to reflect on a limited range of issues (Kingdon, 1984) and often rely on heuristics and pre-existing beliefs and biases (Hilgartner & Bosk, 1988) to process the limited information available to them.

In addition, the uncertainty created by new technologies may also provide an opportunity for incumbents and new entrants with potentially disruptive technologies to influence regulators and the general public (Gurses & Ozcan, 2015). In the wake of disruptive technology, market incumbents will most likely wish to keep the status quo, whereas new market entrants will want change that secures legitimacy for their products and services (Aldrich and Baker, 2001; Ingram and Rao, 2004). Both sets of actors may use the term public interest strategically to influence their institutional environment, and to obtain favourable outcomes. However, to our knowledge, there are very few studies exploring the public interest construct within the technology context, which we believe is vital to understand technology evolution. More studies are needed to scrutinize and understand the efforts of both new entrants and incumbents in framing the new technology with respect to public interest.

**METHODOLOGY**

Due to the lack of research on how public interest acts as a cognitive frame in contexts of disruptive technology, rather than constructing propositions, we carried out an inductive study (Eisenhardt, 1989). We carried out a longitudinal, comparative-case study using three cases: namely, Cable TV, VOIP, and Cloud Antenna. We carried out multiple case studies to ascertain contributions to more accurate, generalizable theory (Eisenhardt, 1991; Yin, 1994). Our longitudinal approach is also suitable because
entrepreneurship often occurs in long periods (Aldrich & Fiol, 1994; Anderson & Zeithaml, 1984; Tushman & Anderson, 1986) and public interest is a fluid phenomenon, lending itself to observation over time rather than snapshots in time. In doing so, our cases encompass search for manifestations of public interest in favour of or against the new entrants as well as incumbents. These three cases are appropriate for pursuing our research on because first, all three are disruptive technologies and therefore all three are likely to provoke reactions from incumbents. Second, despite the fact that they are significantly distinguishable from each other, they are all subject to the same regulator (the FCC) which provides a more standardised setting for our analysis. Furthermore, the regulator that they are subject to as a strong and established one which implies that the new entrants are likely to have to engage in additional efforts to be accepted and ultimately be established. Third, all three organizations face strong incumbents which makes them interesting cases for studying competitive advantage. Finally, our cases are a mix of successful versus failed cases which gives us the advantage of distinguishing between phenomena that are associated with successful outcomes versus those that are not.

**Data Sources**

Our sources of data comprise of Factiva, annual reports from the industry regulator, newsletters and communications from various industry actors, academic articles, articles from publicly available high-reputation institutions, and reports from research institutions. The large quantity of documents over the time period shows 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 but also to identify Amicus Curiae (friend of the court) reports filed in support of, or opposing organizations behind
disruptive technologies. An Amicus report is an official report submitted by a third-party constituent who is not party to a case and 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, we make use of official reports from the regulator (FCC) which are long (on average more than 100 pages) and carefully prepared, and therefore provide a very rich data source. These annual reports are the regulator’s main method of communication, and therefore capture important and timely information about how the regulator views particular issues and responds to other actors’ demands. Similarly, newsletters and public communications of both the new entrants and the incumbents illustrate the logic and framing efforts of these key actors. Furthermore, articles from law and economics journals from this period were also a key source, since a lot of public and academic discussion based on changing regulation has captured the attention of academics.

Case Analysis

We analysed our data through constant iteration between theory and data (Eisenhardt, 1989) to identify similarities and differences between existing empirical work and distinguish between existing and emergent theory. In the next section, we discuss how the concept of public interest was simultaneously used either to promote or to restrict a disruptive technology. To preserve a basis for inter-case comparison, our three cases (Cable TV, VoIP Communication, and Cloud Antenna) are chosen from within the communications industry (this industry description covers broadcasting as well as telecommunications) where they all fall under the jurisdiction of the same
regulator: the FCC. In chronological order they represent instances of the effect on a market of introducing disruptive technology.

**Case 1: Cable TV**

The origins of what we now call Cable TV date back to late 1940’s when regional technology entrepreneurs in the United States started to use cable wires to deliver television programs to rural homes that were too far from established antennae to receive over the air signals. At the beginning, most welcomed the new service because the entrepreneurs framed it as something that was beneficial to the public interest, namely making TV accessible to the general public. In order to ensure the buy-in of the TV broadcasters, the entrepreneurs also framed the new service as complementary to theirs, i.e. as a way to increase the reach of their broadcasts, and thus boost viewers and advertising revenues. An early cable entrepreneur, Archer Taylor, explained how they initially framed this technology:

“We didn’t want to compete with broadcasters, we didn’t go after the advertisers. We were an extension of their services”

In terms of regulation, cable TV initially fell into a regulatory void. It provided television programs, and so the FCC was thought to be the appropriate regulatory agency. However, it did not directly use over the air signals. Instead, cable TV did relayed over the air signals arriving at community antennas to households through wires (cable). This meant it was out of the FCC’s jurisdiction. Instead of immediately mounting regulatory barriers to entry, the FCC adopted a laissez-faire position towards cable through the 1950s. This was mainly because they bought into the cable entrepreneurs’ framing of this technology as extending incumbent broadcasters’ signals and therefore bringing diverse programs to rural areas in the public interest. One of their statements read:
“We do not now envision where we could find that the public interest would be disserved by affording an opportunity for choice of service and the benefits of competition and diversity of expression in the case of community antenna TV”

In the late 1950’s, as this service had grown, the possibilities became clearer for mass-market pay cable TV. Some entrepreneurs began to speculate about the prospect of delivering premium programming using their service. At this stage, there were strong reactions from market incumbents (existing broadcasters). They immediately started to pressurize the FCC to regulate and to ban what came to be called pay television. Specifically, they used two arguments, both based on the concept of harm to the public interest, which we summarize here:

1) Consumers would get the same programs under both pay television (supported by subscription) and free television (supported by advertising), but the introduction of pay television would mean some consumers now having to pay for these programs. Thus, pay TV would harm the public interest by driving up costs.

2) Some broadcasters asserted that pay TV would favor wealthy elites at the expense of the general public. Only the wealthy would be able to watch the new pay TV. The rest of the public, the vast majority of citizens, would be left without programming. Thus, pay TV would harm the public interest by introducing inequity.

In response, cable operators started a public campaign. Once again they framed their technology in terms of the public interest, but they defined this differently from before. Specifically, they focused on cable’s higher carrying capacity, which allowed for more channels including local news, weather, education, and religion (Barnett and Greenberg, 1968). They also appealed to local schools and churches to support cable TV. Cable entrepreneur Charles Clements recalled:

“We convinced city councils that every school and church needed a TV channel”
The national campaign promoting pay cable TV was based on the possibility of providing local public service programming, and thus offering diversity in social and educational programs on cable. By targeting intellectuals and minorities, the entrepreneurs mobilized these groups and increased pressure in the institutional sphere. After immense legislative pressure, the FCC allowed pay cable TV to operate without restriction in the late 1970’s. Between 1975 and 1989, cable TV subscription jumped from 9.8 million to 47.5 million and pay TV penetration more than tripled (from 24% to 79%).

The example of cable TV illustrates how during the introduction of a disruptive technology, market entrants and incumbents both can use public interest to influence their regulatory environment. That the definition of what serves the public interest is open to interpretation was even acknowledged by Peggy Reed, a legal advisor to the FCC:

“Public interest is a constantly evolving concept that almost has to be vague in order to account for the evolution of various communications media”

Case 2: VoIP

Public interest was also contested during a battle between entrepreneurial Voice over Internet Protocol technology (VoIP) providers and incumbent fixed line telecom operators starting in the late 1990’s and early 2000’s.

VoIP allows the user to make telephone calls using a broadband Internet connection instead of a regular (or analog) phone line (FCC, 2005). Accordingly the emergence of VoIP technology created a clear threat to revenue for regular phone communication providers. In 1996, America’s Carriers Telecommunication Association (a trade association of telecommunications industry incumbents) filed a petition with the FCC, asking the agency to regulate VoIP providers. The association
argued that VoIP companies were providing a telecommunications service and should be regulated in the same fashion as long-distance service providers. This would make VoIP companies subject to the same fees and access charges as the large telecom companies rather than their activities falling under ‘information services’ where there was no regulation.

More specifically, the incumbents used public interest arguments to argue that VoIP companies should also have to pay Universal Service Fund fees. These are collected from telecommunications service providers to finance discounted telephone service to low-income persons; subsidize service in high-cost areas, and give financial aid to schools, libraries, and health-care organizations to access resources available via the telecommunications network. The clearest example of linking public interest to Universal Service came in a statement from the Union, Communications Workers of America (CWA), one of the interest groups of telecommunications industry. This began with a statement of the public interest:

“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.”

In turn, VoIP service providers (companies like Deltathree, IceNet, ITXC, M5, USA Datanet, PointOne, Red Gap Communication) also appealed to the public interest, in pleas that exemption from the charge would mean, ‘allowing a revolutionary technology to grow.’ Their association VON (the Voice on the Net Coalition), much smaller in size, urged the FCC to classify VoIP and other IP-enabled services as
"information services" which is much less regulated than telecom services. The President of VoIP Company, Red Gap Communications, framed this not in terms of disruption, but as a continuation of existing policy:

“We are hopeful that the FCC will continue its policy of not applying regulatory and economical barriers to new and innovating Internet protocol services.”

The executive vice president at PointOne, stated:

“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, since (as the pay TV argument had been) it was framed in terms of the public interest, but it was also more closely linked to national competitive advantage. FCC chairman Michael Powell had warned telecommunications companies in the US that they face a serious, and life-threatening, challenge from VoIP telephony. Speaking at the National Cable and Telecommunications annual meeting, he said:

“If you're a big incumbent and you've sort of enjoyed a competitive advantage . . . you, in my opinion, ought to be terrified.”

After a 10-year battle involving the FCC, legislators and courts, the VoIP providers succeeded in 2005 in being classified as information services companies, which allowed them to grow without regulation.

Case 3: Cloud Antenna

The final case we will examine is the recent case of a cloud antenna company Aereo. Founded in 2012 with $20.5 million financing, Aereo described itself as
“potentially transformative”. The technology consisted of using "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 watch programming, this arrangement made Aereo’s service compliant with legislation. Otherwise, retransmitting television over-the-air without a license (like those paid by cable or satellite television companies) would infringe the 1976 Copyright Act. Instead, with a single antenna assigned to each subscriber, the transmission ceased to be understood as “public.”

As one might expect, very soon after it began operations, Aereo was sued by broadcasting networks and cable TV stations whose revenues were threatened by the new technology. Just under two weeks of being established, Aero found itself in court 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 two cases, the public debate quickly centred on what served the public interest. On the one hand, industry incumbents like Cablevision, CBS and Disney argued that creative content could only flourish if protected and incentivized. Gordon Smith, the President of National Association of Broadcasters, urged the Constitution to “stand with free and local television.” On the other hand, Aereo defended itself with a freedom of choice argument, arguing that their service was legitimate: just like it was any person's right to put an antenna on the top of their roof, it was also their right to put an antenna on their mobile device. Aereo 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, since it was not only based on freedom of choice (a strand in the argument for pay TV), and not only emphasized access to new technology and competitive advantage (additional strands in the argument for VoIP), it also much more heavily emphasized individual liberty, and cost savings. In echoes of pay TV's campaign to mobilize other constituencies, Aereo set up an advocacy website “Protect My Antenna” where they called consumers to action; and consumer groups did indeed join Aereo’s appeal to “give consumers the choice for cheaper, more diverse programming”. This initial emphasis on the consumer positioned Aereo almost as a Robin Hood figure - standing up for individual viewers against the all-powerful, greedy broadcasters:

“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.”

As Woiceshyn and Falkenberg, (2008: 93) identify, "Fundamentally, a firm’s economic logic is dictated by the customers it serves." This is relevant here since the Robin Hood stance was perfectly in tune with the nature of the disruptive technology.
Aereo was turning something massive and "public" - over the air broadcasting, into something very personal and private, through a form of miniaturization, "my antenna". The shift from mass, supply-side broadcasting to individualized, demand-led viewing was necessary to finesse existing legislation, but it was also a function of this contemporary, disruptive technology. When the issue of copyright infringement went to the Supreme Court, Aereo widened its public appeal, sensing perhaps that their case for special treatment was not likely to succeed. Instead, Aereo switched focus, arguing that this case was not just about their specific technology, but about protecting the future of cloud technology, which Aereo used in order to allow subscribers to record TV content to watch later. Rather than a champion for consumers, Aereo positioned itself as a champion of the economy (in echoes of the VoIP arguments). This was another public interest defence, but it was far more expansive:

“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.”

Aereo was not simply disruptive as a technology, it was also disruptive in terms of being a new business category. People were not sure whether it was a cable company, or a satellite provider, or whether it was some new variant of a telecommunications company, or whether it simply provided services to mobile phone users. Essentially, the Supreme Court ruling came down to having to categorize Aereo into a pre-existing industry type. The choice ultimately was between two options, as an industry analyst commented: "Is Aereo like a rooftop antenna of individuals or is it like a cable company?" In June of 2014, the United States Supreme Court ruled that Aereo was subject to cable companies’ regulation and had to follow the regulatory guidelines accordingly. This verdict put a huge strain on the company's resources and Aereo
eventually had to file for bankruptcy and cease operations later that year. Gene Kimmelman, president and CEO of consumer group Public Knowledge stated:

“It is very unfortunate for consumers that the Supreme Court has ruled against Aereo, which has provided an innovative service that brings consumers more choices, more control over their programming, and lower prices.”

Throughout the case history of Aereo, we see a shift in public interest from supporting Aereo to turning against Aereo. For instance, within the first two years of Aereo’s existence, ten Amicus briefs were filed in favour of Aereo. These coincide with the times that Aereo enjoys victories within the courts such as a ruling by the federal court that Aereo did not violate U.S. copyright law. However, in the last three months of its operations, the tide changed and seventeen Amicus reports were filed against Aereo, one drafted by the Justice Department of U.S.A. In terms of appeals to the public interest, an interesting aspect to this case is the shift in rhetoric from Aereo. From February 2012 to June 2014, public opinion transformed from perceiving Aereo as a Robin Hood figure to Aereo as a champion for the economy, but the latter was out of synch with Aereo's business model. "My antenna" technology turned something very public into something very much individualized for the consumer. Though this suited the Robin Hood appeal to the public interest, Aereo's ultimate arguments for special treatment were based on much generalized appeals to public interest. These were perhaps less convincing because Aereo were not ultimately serving the public, they were serving their customers.

DISCUSSION

The case analyses presented above illustrate that public interest is a deliberate and discretionary cognitive frame employed by new entrants and incumbents in contexts associated with disruptive technologies. While we are not the first to draw
attention to the relationship between publicly oriented bodies of actors and institutions and technologies, we believe our work is the first of its kind to delve into the concept of public utilised strategically by new entrants and incumbents alike in order to gain market power.

Our research draws on existing research which argues that fast-clockspeed industries are cognitively constructed (Nadkarni and Narayanan, 2007) and that organizational environments are not objective, but rather perceived or enacted (Smircich and Stubbart, 1985). In other words, public interest is not only likely to be an important frame for organizations, but also is likely to play a significant legitimating role for organizations operating in high-velocity industries.

Our analyses also unveil interesting observations about public interest. For instance, our research findings reveal that the criterion of public interest is quite a flexible one, and can be used strategically by rival groups of stakeholders arguing for diametrically opposed outcomes. It may be that public interest is particularly open to interpretation during the regulation of new and disruptive technologies in broadcasting. In the cases we have presented, the changes could be swift and they could affect masses of people, which throws questions of public interest into prominence. As a result of such disruptive change, legislation needed to catch up with technological innovation in each case. More fundamentally than legislation, disruptive technologies also raised questions for our very understanding of what public interest means. The three cases show how disruptive technology is not just disruptive to markets, consumers and goods, it is disruptive in terms of our understanding of public interest.

These new technologies created uncertainty because of the absence of specific legislation, but they also created a kind of ethical void. In the absence of appropriate or definitive evaluative criteria, rival stakeholders were able to use different appeals to
public interest to try to shape their institutional environment. The cases all show that
determination of what "public interest" means can be extraordinarily complex and that
such determinations have profound implications. To take the most recent case, if the
Supreme Court had accepted Aereo's arguments that it was championing new
technologies that have economic benefits, they could have ruled otherwise, and the
global media landscape now would be a very different one. Looking back to the oldest
case, if cable TV had been blocked in the early days, this would have had significant
effects on all subsequent broadcasting.

Table 1 provides a detailed comparison of the different uses of the public
interest concept through sample quotes.

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One useful starting point of discussion is to contrast the different senses of
"public" that can be engendered by different argumentation by stakeholders when
discussing public interest within the context of technology. Former conceptual studies
have investigated notions of ‘public’, focusing, for instance, on concepts such as
communities (e.g. Van de Ven and Garud, 1989, 1994; Aldrich and Whetten, 1981;
McKelvey, 1982; McKelvey and Aldrich, 1983; Astley, 1985; Astley and Fombrun,
1987; Barnett and Carroll, 1987; DiMaggio, 1988; Freeman and Barley, 1990). In this
paper, we argue that firms may have varying approaches rather than using pre-
determined and constant notions of the public. Some firms may conflate the citizen with
the consumer, or the market with society whereas others may keep these two things
firmly separate. For example, the public, for an advocate of a disruptive technology
such as Aereo's was initially their consumer base. However, the countervailing and
more successful argument emphasized damage to a broader community through copyright infringement. Whereas Aereo had a comparatively narrow construction of public, the argument in favour of VoIP was successful partly because it relied on an even more expansive notion of public. The public was not just anyone with a fixed telephone, but anyone with a computer and modem. Similarly, Cable TV initially began with the promise of broadening access and reach of TV to the general public, which allowed them to grow without much interference from regulators.

The arguments advanced by market entrants often place more emphasis on economic principles. In some senses this is not surprising since they each typically represent the realization of commercial opportunity - the growth and creation of markets, or the ability to deliver value. One aspect to disruptive technology is that it allows a basis for competition. Another feature of disruptive technology is that it may be harder to make appeals to ideals we might associate with flourishing, sustainability and a reach across society as a whole rather than one segment of society.

The arguments by incumbents often place more emphasis on sustainability, citizenship and flourishing. Again this is not unexpected since incumbents will be emphasizing the status quo, and orienting to a desired future based on the continuation of existing practices, as well as trying to appeal to established traditions and a set way of doing things. In addition, because these technologies are already embedded and have a wide reach, incumbents often have a rhetorical advantage in being able to employ the concept of "public" much more broadly, and in a way that is consistent with the notion of society. Whereas a disruptive technology by its nature usually has consequences that are uncertain, and often has no established market, market incumbents will be likely to have a mature customer base and given the industry is broadcasting that is likely to be reflective of wider society and not just those on the cutting edge of new technologies.
By demonstrating how public interest was simultaneously used to either promote or restrict licensing by stakeholders with opposing perspectives, our goal was to compare and contrast these uses, exposing contradictions and dilemmas to ultimately arrive at a conclusion over the need to define public interest in a more robust way within the technology context. A more robust account of public interest would help it to be potentially "future proof" and it may make it more resilient towards innovations we might imagine occurring in the future. As a current example, the meaning of public interest is again being debated among various stakeholders in the regulation of the new technology such as mobile applications for car hire (UBER) or accommodation (Airbnb). Overall, we demonstrate that technology entrepreneurs promoting the new technology must be skilled in framing the technology within the public interest and if they can effectively do that, they would induce various stakeholders including regulators to cooperate and allow the nascent technology to grow.
REFERENCES


Patashnik, E.: 2003, After the Public Interest Prevails: The Political Sustainability of Policy Reform, Governance 16(2), 203–234.


Richardson, B.: 1993, Why We Need to Teach Crisis Management and to Use Case Studies to Do it, Management Education and Development 24, 138–148.


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<thead>
<tr>
<th>Technology</th>
<th>Actors</th>
<th>Sample Quote</th>
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<tr>
<td><strong>Cable</strong></td>
<td>Cable Operators</td>
<td>“We didn’t want to compete with broadcasters, we didn’t go after the advertisers. We were an extension of their services.”</td>
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<tr>
<td>Free TV</td>
<td>broadcasters</td>
<td>“Pay TV cannot be regarded as an addition to free television; it is a substitute for free television”</td>
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<tr>
<td><strong>VoIP</strong></td>
<td>VoIP firms</td>
<td>&quot;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.&quot;</td>
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<tr>
<td>Fixed phone</td>
<td>operators</td>
<td>“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.”</td>
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<tr>
<td><strong>Cloud Antenna</strong></td>
<td>Aereo</td>
<td>“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.”</td>
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<tr>
<td></td>
<td>Broadcasters</td>
<td>“Aereo is in the business of retransmitting broadcast television to thousands of members of the public, and has not obtained authorization to do so”</td>
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