

US communication policy after convergence

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The laws and policies that govern communication in the US have evolved over time to treat different media with distinct doctrines. The press, the post, broadcasting and the telephone each abide by different rules, defining who can build and operate the underlying communication systems, who can use them, along what patterns, to convey what information. As these regimes evolved, they adjusted to reflect social, political, economic and technological change. Occasionally over the past century, the advent of a major new communication technology – radio, television, cable, microwave – changed the system of incentives and thus the equilibrium of the policy environment. This prompted more than a marginal adjustment to the rules, resulting in new rules within existing categories, or the creation of new categories to encompass the new technology.

The current media convergence, fueled by increasingly pervasive digital technologies, represents a double disruption. First, the digitization of existing media questions the basis for many existing rules in each medium. For example, digital transmission eliminates much of the scarcity that justified past broadcasting rules. Second, once separate media now become potential substitutes. For example, telephone calls can now be offered indifferently over copper cables, TV cables, radio waves or the internet. While the service is the same, different rules apply to its delivery in each medium. This situation raises the question: is the communication policy goal or its implementation so different in each case that we should require a different rule (or even a different government agency) for each device?

To date in the US, the dominant policy response to both of these stresses has been deregulation, motivated by a trust that the free market's implicit

rules will outperform any government's explicit rules (Horwitz, 1989; Vietor, 1994: ch. 4). This approach has two practical problems: first, policy-makers have found that the creation of 'freer' markets often requires more rules, not fewer (Vogel, 1996) – for example, to ensure interconnection between competitors in a new network infrastructure. Second, in several domains established constituencies insist that deregulation not deprive them of entrenched advantage (e.g. those that receive universal service subsidies and access charges, law enforcement agencies accustomed to the ability to wiretap mediated interpersonal communication).

As a result, policy-makers looking to resolve convergence challenges have favored incremental adaptation of past rules rather than fundamental redesign of the policy regime. They have chosen either to treat a new medium with the policy previously applied to whatever it seemed to resemble, or to adjust through the accretion of exceptions and additions. Thus, policy treats cable television as an extension of broadcast, itself viewed as an extension of radio. To be sure, bolder moves have been occasionally suggested, for example with the 1994 effort to create a new 'title VII' category encompassing broadband internet, whether provided over TV cables or telecom wires (Information Infrastructure Task Force, 1994). Yet, efforts to date 'tend to be more statements of aspiration than realistic policies directed to achievable goals' (Melody, 1996: 258). If they are specific, they aspire at most to the incremental revision of existing, medium-specific rules, rather than to the development of 'policy convergence' to mirror media convergence. The result reinforces and prolongs divisions between media that were justified by past thinking about obsolete technologies. This article seeks to lay the groundwork for a more sweeping re-examination.

Rather than continued withdrawal or incrementalism, the political battles surrounding media convergence today invite us to step back and revisit the underlying goals of communication policy itself, across all media. This article will address the topic in three parts: considering the US case, we will first (1) present a conceptual framework for understanding the evolution of each policy regime in the US, considering the interaction of four factors: the underlying goal, the communication system, the technology and the policy regime. Next, we will (2) briefly explain the history of communication policy as largely a story of inertia and incrementalism that led to the genesis of the policy regimes governing print, post, telephony and broadcasting. At several pivotal times in the past, a crisis point was reached where a new technological change created a new problem or a new opportunity. Thus a need for collective action to achieve an access goal neglected by existing rules became apparent. To satisfy this goal a policy regime was applied to a particular sector of the media by coupling the regime to a technological implementation. Over time, this regime became foundational – as its assumptions were codified in institutional structures and patterns, further debate occurred within a regime, not about it.¹ The direct relationship to the original goals was then obscured by time – future policy rules in each sector were then not derived

from an appeal to some underlying truth, but from appeals to the rules of the existing regimes. We will finally (3) explore possible approaches to achieving access goals while avoiding the past problems of the tight coupling of policy to a technological implementation. In the past, a particular pattern of communication was bound to a particular platform and a particular conduit; now that these three layers are separable, articulating a policy regime in terms of the technological implementation of the conduit should be replaced by an emphasis on the platform, and the ability of all users to reconfigure it.

A conceptual model for the policy process

Modern communication policy in most of the world has evolved to treat different media as islands; a country may simultaneously have a distinct broadcasting policy, telecommunications policy and broadband policy. Four components of the policy process create these islands: the underlying goal, material context, technology and the policy regime. Our starting point is society's *underlying goal* with respect to communication. The policies crafted for the press, the post, the telephone, radio and television represent government-mediated compromises between those who control communication networks and seek to profit from this control, and those who want to communicate and seek access to these networks. We define 'network control' as the ability to determine network layout, architecture, configuration, applications, price structure and access conditions. Network control is the power to decide how the communication network will be used and by whom, while 'network access' is the ability of citizens and economic actors to use the network according to their needs. We thus take the design of an optimal compromise, from a social as well as economic standpoint, as the underlying goal of policy.²

This notion of an underlying goal should be contrasted with the final implementation of a policy that follows it in two ways: first, 'access protection' may be far from explicit (or when explicit, far from clear) in particular laws, obscured by the technicalities of pricing rules or buried under regulatory sediment. It is the task of the critical analyst to find these goals undergirding the debate. Second, this underlying goal of communications policy – while at times debated – is more permanent than other parts of the policy process. In this way 'goal' is meant as a far more stable and general construct than the actions of making policy – more general than legislative intent in a particular instance.

Next, we observe different manifestations of the underlying goal (access protection) in the *material context of communication*. These are the time-bound, factual circumstances of communication: who is communicating, who wishes to communicate, what is being communicated and, of central interest in the policy context, how this communication is organized institutionally. The underlying policy goal changes slowly, but in different times and contexts the material context of communication may make policy goals seem unstable: we may affirm the goal of protecting the ability of all citizens

to participate in the dialogue required by a self-governing people, but this might be relevant only to those media used for this purpose, or it might recede from awareness when this dialogue does not seem threatened.

Then, *technology* allows particular implementations of the communication system into physical and logical networks that define a set of practical possibilities and constraints.³ This includes terminal devices, network infrastructures and network management software. Their deployment in specific configurations dictates how the communication system can be used, for example enabling private exchanges or public distribution of messages. With digital technology, the configuration of the resulting communication platform has become largely separable from the network's physical layout. In particular, control doesn't require ownership of the physical facilities. Different parts of the technical apparatus can assume more or less importance depending on the technological medium considered, the material context or the policy goal in question. In particular, policy-makers often can choose to focus on specific parts of the technological apparatus for the implementation of specific access objectives: for example, conditional access to video programming can be implemented either in set-top boxes or in cable network protocols.

Technology is often presented as a key driver of communication policy. Most recently, digital technology has been credited with producing deregulation. However, it is more accurate to say that contingent changes in the available technology provide the opportunity for change by reconstituting the incentives and other relationships between actors in the material context, and by stressing those parts of policy implementations (considered next) that are technologically bound.

Finally, the *policy regime* is then the implementation of a goal at a particular point in time within the material context of a communication system and the technical context of available technology. This encompasses laws, regulations, rationales for government intervention, interest groups, regulatory bodies and a regulatory process. Policy regimes possess three important qualities: first, they acquire inertia because they grant benefits. Second, they tend to be formulated in relation to a particular technological apparatus because of the way they evolve, as we will see below. Third, they are highly dependent on the political context exogenous to communication policy. If the underlying goal is the most ideological of the four parts, the policy regimes are the most politicized. A 'climate of deregulation' or a foundational presumption that free market capitalism is the optimal way to allocate resources will fundamentally shape the alternatives considered when a policy regime is formulated.

The US policy cycle

Against the persistent goal of access protection, the evolution of US communication systems, technology and policy regimes has progressed cyclically.

FIGURE 1
Past communication media and their supporting technology
across two dimensions

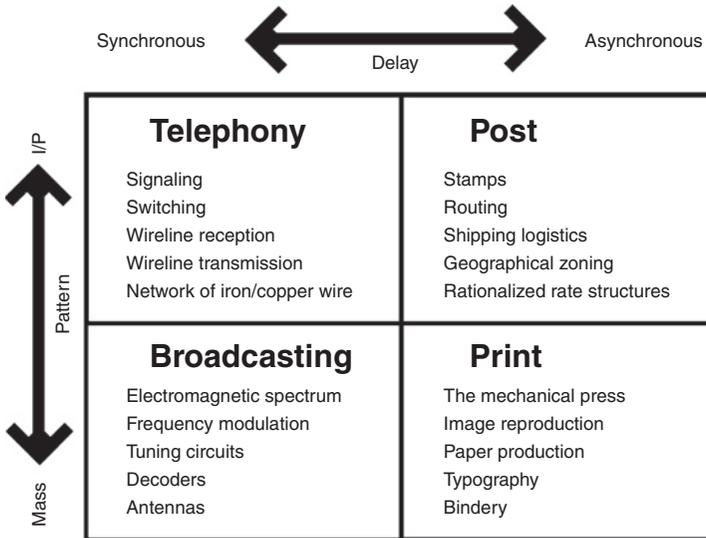
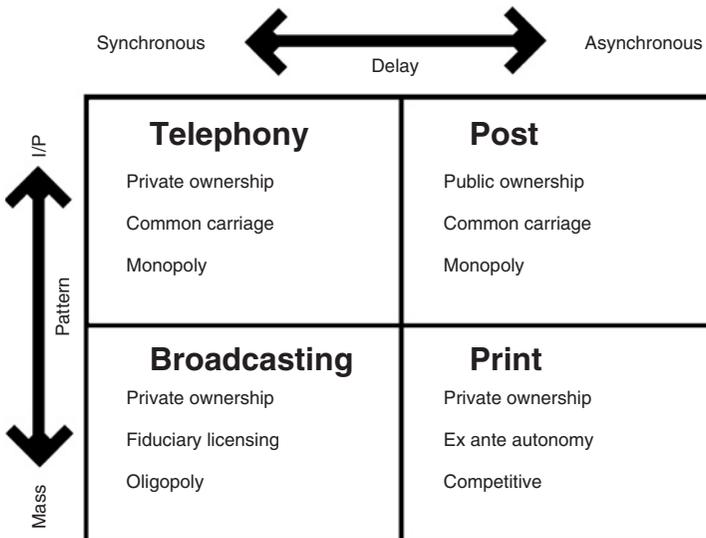


FIGURE 2
Policy regimes governing past communication platforms



Periodically, a technological innovation changes the available technology, stressing the communication system, the policy regime, or both. This precipitates a critical decision point: a decision must be made whether to incrementally change the existing regime or to create a new regime. This cycle then repeats.

A snapshot of US policy at the beginning of the 21st century, the outcome of a series of such cycles, mapped out neatly along two dimensions: *delay* and *pattern* (see Figures 1 and 2). *Delay* refers to whether or not a message is sent and received simultaneously. Communication is either 'live', as in a phone call, or 'delayed', as in publishing – synchronous or asynchronous. The *pattern* of communication is either 'interpersonal' (one-to-one like an exchange of letters) or 'mass' communication (one-to-many like television broadcast), akin to concepts traditionally used in communication research (Beniger, 1987).

The matrix resulting from the juxtaposition of these two dimensions provides a useful map for the classification of traditional media forms. Clearly, for the sake of simplicity, this mapping focuses on the central characteristics of each medium and overlooks nuances. For example, television obviously broadcasts non-live movies, telephone callers occasionally leave 'delayed' messages on answering machines and courier services make the post seem almost synchronous. Although the media descriptions here are not exhaustive, this conceptual map is exhaustive in that any medium could be positioned along these two dimensions. These four quadrants define the four communication policy 'islands' observable in the US, c. 2000. In each of the quadrants, we find distinct systems, different technologies, and separate policy regimes, with very limited overlap until recently. Each is characterized by a different conception of access protection. Within each neatly settled partition of the US communication space, the spread of digital technologies (and the internet as its emblem) has introduced a fundamental challenge: a single communication system, based on one common technological core, can support all four delay/pattern combinations. Furthermore, digital technologies increasingly make it possible to program communication platforms that support multiple combinations of communication patterns and delays, independent of the underlying physical network infrastructure. How can distinct policy regimes make sense any longer? The remainder of this article will analyze the particular control/access bargains that undergird each quadrant's policy and explore their lessons for the construction of a new regime.

We should note that the two distinctions we observe in traditional communication policy – delay and pattern – have fundamentally different roots. Separate policies have emerged for different patterns because the intent of interpersonal vs. mass communication is fundamentally different: private conversation for the first, public dissemination for the latter. By contrast, policy distinctions based on delay seem mostly the consequence of different sets of material constraints attached to different technologies. For example, the licensing of broadcasters and not of publishers has more to do with the technological constraints of radio and printing than with the fact that TV is live while newspapers are delayed. Consequently, as technology changes, we expect

policy distinctions based on communication patterns to be more enduring than those based on delay.

Inertia and change in US policy

In each one of the communication quadrants, the policy cycle has led to a distinct compromise between control and access. In this section, we review the salient features of each and outline the bargains they entail. This is not a comprehensive historical review, in any sense. We depict policy evolution in the US as periods of inertia and incrementalism marked by occasional crisis points where new policy frameworks can be considered. Our goal is to elucidate the underlying rationale for the control/access bargains that emerged through this evolution.

Print: Congress shall make no law

The press in early America included books and periodicals, and the physical infrastructure of these was predicated on private ownership and competition. Books and newspapers were important organs of democracy, giving the literate public an opportunity to learn about political ideas and, in the case of newspapers, a forum to discuss them. Architectural control of this forum – the rules governing what content would get published under which conditions – entirely rested with the owners of the infrastructure, who had full editorial discretion guaranteed by the first amendment.

This fundamental policy doctrine, the basis for freedom of the press, was not seen as a limit on access to the means of communication. On the contrary, because ‘obtaining access to the needed resources was no strain on ingenuity’ (Pool, 1983: 11), presses gave voice to those with ideas to express. The role of government was to refrain from intervening (specifically, to refrain from prior restraint). This is not to say that print was free from policy intervention. The press was regulated through libel and copyright, and a universal access policy was pursued through subsidy in the form of reduced rate postage. While these doctrines were not debated as access policies at the time they were written, they did set limits on the powers of those who control the presses and, in the case of mail subsidy, broadened access for readers.

In our first example of inertia, this policy regime continues to distinguish print long after the initial conditions that motivated it had changed. Over time, in print, as in other media, ‘The ownership of the means of communication ... has passed or is passing ... to a kind of financial organization unknown in earlier periods, and with important resemblances to the major forms of ownership in general industrial production’ (Williams, 1966: 32). As audiences for print have increased, ownership of the material infrastructure has become

increasingly concentrated and access to the means of communication (in the form of the ability to participate in production) has decreased. Print is no longer the purview of individual expression, and effective print communication now requires an expensive production and distribution system. Therefore, while this framework was constructed in an environment where access to the means of production was relatively unconstrained, access to the production of mass print communication today is comparatively restricted, as evinced by the consolidation of the newspaper and book publishing sectors. Yet, the weight of history makes the prospect of government policy to protect access to printing presses and publishing networks unthinkable – an unwarranted intervention by government in a sphere where it is now permanently seen as government's job to refrain from acting.

For the press, the same fundamental set of policy bargains between control and access has endured. Those with ideas to express have access to communication to the extent that they can convince owners to carry their speech, or afford self-publication. For readers, access increases when infrastructure owners compete for content to fill their pages, when they compete for audiences and lower their prices, and when mail subsidies trim transportation costs. Overall, this quadrant continues to rely on market competition to reach a balance between control and access.

Post: Congress shall have the power

Louis XI instituted what is arguably the first national postal system in 1477, *La Poste Royale* (Beniger, 1986). A monopoly was offered as an incentive to contractors who carried government mail so that higher rates for private mail carried by these same contractors could subsidize inexpensive government communication. Government monopoly later resulted from a desire to directly manage this system as a revenue source (Pool, 1983). This was rationalized into a system we might recognize today with the publication of the influential *Post Office Reform: Its Importance and Practicability* by Rowland Hill in 1837 in the United Kingdom, directly leading to the adhesive stamp and uniform postal rates shortly thereafter (Hill and Hill, 1880).

The industrial organization of the post as one of public ownership of a monopoly was an outgrowth of the communication services and applications that were seen as important – initially, this was government mail. Throughout history, private firms have provided ancillary and sometimes competing services with the US Post Office, though some monopoly protections are enacted in law. Although the term 'common carriage' arrived long after the post (Neuman et al., 1997: ch. 2) it best describes the policy arrangement for post that has been the subject of extensive regulation. The postal system is prohibited from discriminating among messages on the basis of their content. Government ownership means that the architecture of the postal communication space is also a

matter of policy, codifying tiered services offering different service speeds at different prices.

In the latter half of the 19th century, the emphasis shifted away from government convenience and revenue to universal delivery to all areas of the nation in order to promote economic growth and the diffusion of knowledge, via correspondence and commerce between individuals. This shift, arguably sparked by Hill's treatise of 1837, can be considered one of the 'crisis points' in traditional media. Hill's new ideas for the rationalization of the post presented a great economic opportunity through the advancement of technologies of organization: for post, the relevant technological apparatus includes geographical zoning, routing techniques, rationalized rate structures and stamps. At this critical period, postal policy-makers of the day had the opportunity to reconsider the guiding policy regime of the sector (public ownership and common carriage). Not surprisingly, although the services and applications of the post changed radically, the fundamental structure of the sector did not change. Hill's tract took for granted a governmental postal system. This reorganization of services led to the establishment of stamps in 1847, free collection (post boxes on the streets) in 1858, free delivery in 1863, then rural free delivery in 1896, but there is little evidence that a restructuring of the policy principles that guide the post was seriously considered (United States Postal Service, 1938). If anything, the Postal Service sought to extend public ownership and government monopoly to other sectors (Postmaster-General, 1890).

Those who used the mail to communicate were given an additional form of access protection through privacy protections for mail. Mail is no longer seen primarily as a source of state revenue or a way to ensure government correspondence. The regulatory system enshrined in the laws that are presently in effect, however, remains largely the same as when it was established – for revenue and government convenience. The emergence of the 19th-century focus on the value of universal delivery – a 'universal access' policy of the late 1800s – did not precipitate a fundamental policy shift. While in many ways the form and character of the communication application changed dramatically in this period, the state-protected monopoly remained the unquestioned policy approach. While the press was seen as the domain where government should remain as uninvolved as possible, the long course of tradition and the examples of other nations showed that the post was the quadrant whose business was properly and 'naturally' handled by government. With government control came policies to guarantee broad access in the form of common carriage, privacy protection and subsidized rates.

Telephony: one nation, one policy, universal service

The earliest application of the telegraph was the control of railroad networks, but by the 1850s the dissemination of news and business communiqués came

to the forefront. The telephone was initially seen as a direct replacement for the telegraph and suitable for business uses, but by 1920 'sociability' and other non-business use between individuals would come to be profitable (Fischer, 1987). Both telegraph and telephone can be characterized as initially competitive industries that quickly consolidated into single networks run by one dominant firm: Western Union, then AT&T (Lubrano, 1997).

As it served the same potential audience as the post, but with less delay, the development of the telegraph occasioned another policy crisis point in 1845. Should the telegraph be organized on the basis of public ownership and common carriage, as was the post, or should some new framework be developed? The question was settled when Congress was reluctant to appropriate funds for an experimental, publicly owned telegraph from Washington, DC to Baltimore (Chandler, 1977: 197). In other respects, however, the telegraph was clearly seen as a direct extension of the mail and later policy retained the approach of common carriage adapted from railroad regulation. The first round of government intervention was a federal response to AT&T's acquisition of monopoly market power in the early 20th century. Telephony in the following period was marked by extensive regulation, beginning with the 1910 expansion of power of the Interstate Commerce Commission to include telecommunications, through the establishment of a specialist regulator, the Federal Communications Commission, in 1934. Very much at issue in early debates about telecommunications was the nature of competitiveness, cost and interconnection in telephone markets (Viator, 1994: 169–73). A monopoly, not clearly rationalized for the post, seemed 'natural' because of the extensive economies of scale to be had in the construction of the phone network and the necessity of central coordination.

While telecommunications policy may have had more change over time than, say, policy regarding the post, all decisions were still well within the range of the traditional policy regime of a government-sanctioned, privately owned monopoly, until the comparatively recent rethinking of natural monopoly and an emphasis on competition – beginning with long distance and now envisioned as realizable throughout the system to the local loop.

Counterbalancing the control of this monopoly infrastructure owner, two categories of access goals were articulated for telephony as soon as the sector progressed to a broad customer base. First, the protection of 'open access' to the dominant firm's communication facilities, for those who would provide complementary infrastructure, was an early goal and a sustained policy effort in this quadrant. Initiatives included the Kingsbury Commitment's 1913 protection of interconnection, the restriction of predatory pricing as widespread competition in long distance arrived with upstart MCI, and later requirements for unbundling. Second, access to the means of communication for users emerged as an important concern, especially given telephone company arguments about the high cost of serving rural areas. This led to a variety of policies to promote 'universal service' beginning in the 1960s: subsidies for poor

users, subsidies from urban to rural users, as well as network penetration and investment goals (Mueller, 1997; Sawhney, 1994).

A recent crisis point in telephony policy came with the introduction of digital technologies in the 1970s. Computer technology allowed the telephone system to provide an increasing array of 'information services', in addition to interpersonal voice conversations. To encourage innovative development of these new services policy exempted them from common carrier regulation. Crafting the appropriate regime turned out to be complex, and successive Federal Communication Commission (FCC) 'Computer Inquiries' in the 1970s and 1980s tried a range of approaches. These included attempts to distinguish 'basic services' (regulated) from 'enhanced services' (unregulated), and requirements that an incumbent monopoly offer any non-basic services through separate subsidiaries. The last outcome of the 20th century, initiated by the 3rd Computer Inquiry in 1986 with the concept of Open Network Architecture (ONA) and codified in the 1996 Telecommunications Act, rests on the concept of network unbundling. Incumbent local exchange carriers, who still essentially own the most significant portion of the local telephone network, must offer access to unbundled network elements for any company wishing to offer services that use parts of their network.

Conceptually, this new compromise between control and access extends the spirit of the interconnection requirements established by the 1913 Kingsbury Commitments. One dominant company's control over essential network resources (then hardware, now also software) needs to be offset through open access. Insofar as they follow this long tradition, ONA and the telephony provisions of the 1996 Act constitute incremental policy adjustment to new technology within the telephony quadrant of our map. But network unbundling also introduces seeds of change that reach far beyond telephony. It recognizes that, with digital networks, access to network management software features is as important as access to facilities. It underscores the fact that multiple actors can now create, on underlying facilities they do not own, software platforms that coexist with and support numerous communication patterns. In short, it acknowledges that network control is now separable from network ownership.

Broadcasting: the use, but not the ownership thereof

For broadcasting, policy crisis became apparent almost immediately after invention. It seemed as though the radio could be a wireless telephone, and subject to the same regime. However, a strong departure from common carriage emerged after much early debate (McChesney, 1993; Smulyan, 1994). Although investment in telephone networks was expensive and it would be wasteful to duplicate it, capacity was not seen as scarce. But in the early consideration of radio an argument for change based on the

extreme scarcity of the electromagnetic spectrum carried the day. The resulting policy regime could be characterized as private ownership and fiduciary licensing. 'A license to broadcast ... involved a fiduciary responsibility to serve the public interest more than a right to broadcast or a right to ownership of a channel' (Streeter, 1996: 97). Although public interest obligations have devolved into a little more than an empty shell, the idea that content should (or could) be controlled in the US is a surprising revelation, given past traditions.

The argument for a fiduciary system again involves access: the perceived scarcity of the electromagnetic spectrum justified the intervention (whether the spectrum is indeed scarce is subject to some debate, see Pool, 1983) and it was partly a perceived need to protect access for those who would provide content that led to a fiduciary system.⁴ Television set diffusion or 'universal access' policies to promote transmitters in all areas, however, were never seriously considered – probably because the main 'applications' offered over television were not seen as essential candidates for government support. Limited 'open access' goals were pursued, however, through ownership limits and the reservation of spectrum space during the allocation process for educational purposes. The current policy compromise between control and access gives license holders extensive editorial control.

The development of cable television is one of the best examples of an explicit crisis point forcing policy action. Even though the development of cabled community antenna television (CATV) technology provided a viable alternative to over-the-air broadcasting, the FCC studiously ignored cable television until 1965, when it grew large enough to threaten established broadcasting interests (Pool, 1983: 157). There is little technological or organizational similarity between television and cable. It is far from obvious that television rules forged upon the scarce electromagnetic spectrum should apply to plentiful cable, or that the FCC had the authority to apply regulation to cable. Yet, 'the courts define a new technology as a special case of a familiar one. Just as telephones were defined as telegraphs, so cable television was defined as television' (Pool, 1983: 161). Today, with cable as with broadcast TV, license holders have quasi-absolute editorial control over who has access to their network and can provide content.

Which familiar policy regime was to be used as a model for cable was open for debate – many argued that cable should be regulated as print, or as a common carrier.⁵ Access goals are clearly in evidence, be it access to the means of production (via community access channels and local origination rules) or access to the content produced (via must-carry rules). As with other media, these access goals were embodied in specific, technologically dependent rules and once the initial policy regime was chosen it persisted. Even in the successive waves of cable deregulation (then reregulation) that followed from the 1980s onward, the dominant way of thinking about cable as an extension of television went largely unquestioned.

The internet: the modern crisis point

The internet's dramatic success is the new crisis point in communication policy. With the advent of digital technologies, the traditional policy mapping we have identified becomes untenable. First, the four quadrants of Figures 1 and 2 no longer provide a neat partition of communication technologies, communication systems and industrial organization. Indeed the internet, today's central manifestation of digitization, offers applications that fit in each one of the four quadrants: from live/interpersonal chat and internet-telephony to delayed/interpersonal email, from delayed/mass web publications to live/mass webcasts. As a result a single infrastructure, the internet, now offers the range of applications that once existed in distinct domains, governed by different policies reflecting different compromises between control and access. In addition, the internet also brings about new applications that defy classification along the traditional delay/pattern axes: one-to-few, few-to-one, few-to-few, narrowcasting, combined with a wide variety of delays. Policy has come to understand media through the lens of four distinct quadrants and the internet forcefully demonstrates how this understanding was an artifact.

Change has not been restricted to new applications: digital convergence has modified the old technological implementations in each cell of Figures 1 and 2; ubiquitous computation is now the norm for every part of our table. With the technological apparatus in each quadrant becoming more and more similar, firms are no longer restricted by expertise to participating in one cell. Companies from all quadrants are now eager to enter other quadrants, now that they can shape communication platforms that can support new communication patterns on their traditional infrastructures. For example, cable TV 'broadcasters' now provide telephone service, while telephone companies are eager to offer internet-based broadcasts. While firms of the past often operated within only one quadrant, firms' boundaries no longer match table boundaries: cross-cell participation is now commonplace and will become more so.

As we have shown, old distinctions between traditional media have become calcified in distinct regulatory bureaus and policy regimes. Today, the regulatory apparatus continues to apply principles of the past to industries in which they make less and less sense, and for which there is less and less of a rationale. For example, should companies offering telephone service pay access charges if they use old telephone technology, but be exempt if they elect to use internet telephony? Does it make sense to require open access from telephone companies providing high-speed internet access through Digital Subscriber Line (DSL) technology, and not from cable operators offering the same service with cable modems, simply because one has been regulated as common carrier and the other as a broadcaster? Regulation by inertia breeds such inconsistencies.

Among other implications, this disintegration of boundaries means that regulatory decisions about converged industries have the potential to affect all

types of communication. As firms increasingly interact across regulatory boundaries, and as once distinct applications blur together, the opportunities for arbitrage proliferate and regulated markets create unexpected and unintended incentives. Given the heightened complexity of the policy-formation task in this environment, policy-makers are reaching a modern crisis point. The solution is to consider the goals of communication policy without resorting to policies that are technology-specific, and it is to this that the article turns next.

Possible approaches in a converged environment

The communication policy response to the crisis of convergence has so far been distinguished by two approaches. Both rely on defending existing categories, but they differ in their approach to new technologies. The first approach is to fit new communication services into existing categories. The FCC's 'Computer Inquiries' constituted the initial example of this trend, an effort that has given us 'basic', 'enhanced', 'information', 'telecommunication' and other dysfunctional distinctions meant to reconcile new communication services with old rules. Attempts to treat high-speed internet service over cable as 'programming' or calling internet telephony an 'enhanced service' follow that tradition.

A second, bolder approach attempts to establish new categories for new services. For instance, the Clinton administration proposed in 1994 to create a title VII of the Communication Act applying to companies that would combine cable and telephone (and other) networks to provide 'broadband, interactive, switched, digital services' (Information Infrastructure Task Force, 1994).⁶ This was intended as an addition to, not a replacement for the existing telephone and cable policy categories. The 1996 Act stopped short of setting up a specific policy category (Esbin, 1998: 118).

Both approaches suffer from similar shortcomings. Even adding new categories does not reconcile the problems with existing regulatory divisions. These are marginal adjustments anchored in particular technological implementations, rather than initiatives anchored in any fundamental purpose. Next, this article will re-examine these fundamental purposes and explore their implications for policy-making in the post-convergence world. A questioning of the entire communication policy edifice is unlikely to succeed politically, as it challenges too many established practices and entrenched interests. However, it can be a worthwhile exercise: even though policy may continue to be incremental, a more fundamental analysis can provide a guiding principle against which adjustments can be judged.

In the previous brief history of communication policy in the US, in each quadrant policy has consistently taken the form of a bargain struck between control and access. While market structures and regulatory regimes have varied across quadrants the distinction between communication patterns (mass or

interpersonal) rises above particular technological differences because it contrasts two qualitatively different patterns of communication behavior.

The nature of the first pattern is given in the origin of the word *publish* – from the Latin *publicare*, to make public. In the activity of printing and later in filming and broadcasting, of greatest concern is information intended for public dissemination. To the extent that a message is produced to be made public or semi-public, and a technological medium is required for such dissemination, a certain set of access concerns are immediate: the medium has become a vehicle for public expression, and such are required for a democracy to function. Citizens must be ensured the ability to participate as both producers and recipients. A one-to-many organization precludes all from participating as producers, therefore steps must be taken to ensure that access to the means of production is protected so that (at least) a reasonable diversity of content will be produced.

The second pattern of communication is described by the quadrants of telephony and post. This pattern is the *private exchange* of messages between individuals or small groups. Since the development of the post, systems of private exchange have been recognized as a crucial infrastructure necessary for the administration of government and commerce. Access to systems of private exchange has become essential for participation in modern economic and social relationships. With this second pattern of communication, it is again necessary to grant citizens access to communication channels, yet rather than a diversity of content, this kind of communication implies a concern over the integrity of communication – in particular privacy of communicators and non-discrimination by those who control the channel.

In addition to public dissemination and private exchange, we now see an explosion of new patterns mediated by digital networks. They include narrow-cast specialty publications; many-to-many network-based auctions; many-to-one customized newsfeeds' seller-sponsored, buyer-advocate or neutral electronic marketplaces; few-to-few video-conferences; along with potentially countless pattern variations that can now be programmed into the software that controls networks. These new patterns and the many others yet to be invented combine features of the two fundamental patterns: publication and private exchange. Yet most of them span across the two quadrants in Figure 2 and could not adequately be governed under the existing regimes. What becomes increasingly important in this new world is the ability to implement a wide range of communication patterns, rather than simply the right to make use of existing ones.

In past communication policy, particular technological networks were considered and rules were tied to them. With the advent of convergence, the configuration of a communication network is determined less by its underlying hardware infrastructure than by control software. The fading distinctions between print, post, telephony and broadcasting are a symptom of the more fundamental separability between three network components: physical hardware,

control software and communications applications (Bar, 1990). In the past, particular communication networks exclusively served public dissemination or private exchange functions, and technology-specific regulation was feasible. Today, a single conduit can be used either for public dissemination or private exchange and communication patterns are defined within the network's control software.

This software layer, where network configuration is defined, is a *communication platform*. This phrase means to invoke several meanings. Platforms allow speakers to stand above the crowd and make their message public. As used in computing, a platform is the operating system upon which applications can be built. A platform is itself a constructed object that determines the shape of what can rest upon it. Examples of communication platforms can be the software that runs a telephone switch, an online auction or an electronic program guide. In digital networks, this is the key component: this is where network configuration is defined, where interconnection between separate physical networks is made possible or prevented, and where coexistence of various service providers ('open access' in the terms of current policy debates) is permitted or denied.

In past networks, the communication platform and its configuration were 'hard-wired' in the specific arrangement of electro-mechanical devices that formed a particular communication network – the logical architecture of the network precisely reflected its physical architecture. One had to own the network to change that arrangement. By contrast, platform configuration in digital networks depends on the ability to program the network's control software. Control over network configuration thus becomes separable from network ownership. Multiple network platforms, supporting a variety of communication patterns, can simultaneously coexist on a single physical infrastructure. This newfound separability between a network's logical architecture and its physical layout therefore calls for a new policy bargain between control and access, one that allows a non-discriminatory *ability to design* the architecture of a communication platform, not only for those who own and control network infrastructures, but also for end-users or third parties.

There is a policy interest in safeguarding the ability to design, for two reasons. The first is fairness, because the architecture of communication platforms strongly shapes the interactions that occur in these spaces, making certain forms of interaction either possible or impossible (Lessig, 1999). For example, the architecture of an electronic marketplace affects the relative competitive power of market players, the architecture of a discussion forum influences participants' ability to be heard and to convince others. As network-mediated activities proliferate, participants should at least be aware of the built-in architectural biases of the spaces they frequent. At best, they should be able to influence the design of existing spaces to reflect their own needs, or to design alternative spaces that do so.

The second reason is the promotion of innovation. Those who control networks tend to design communication platforms which will support the

patterns of interaction that further their interests, reflect their own history and utilize their existing technical expertise. It is important not to foreclose exploration of other approaches, allowing those who do not control networks, such as users or third parties, to bring forth different visions of how we might communicate. The internet provides many examples: network users invented new patterns of communication and implemented them on a network infrastructure where their ability to design was promoted by open standards and open access to some of the telephone network's building blocks. In the future, policy ought to find ways to generalize such conditions.

As stated earlier, the purpose here is not to prescribe specific policies but to establish the fundamental goals communication policy should pursue. We identify three goals, two that emerge from traditional policy regimes for mass and interpersonal communications, and an additional one that results from newfound possibilities open by digital networks. To counterbalance network control, policy ought to protect three basic access rights of the participants in communications systems. The first, the *right to publish*, requires the protection of reasonable access to a non-discriminatory publication medium for one's ideas (or for one's product, or service). The second, the *right to private exchange*, calls for reasonable access to a non-discriminatory channel for network users (individuals, machines or groups of these) to exchange messages with each other. The third, the *right to design*, requires protection of reasonable, non-discriminatory ability to design a communication platform that supports alternative communication patterns.

Ideally, protection of the right to design would be sufficient. Indeed, it would guarantee anyone's ability to design a communication environment that protects their right to publish or one that affords private interaction. However, because the transition to fully programmable, digital networks is still under way, we need to continue to consider the right to publish and the right to private exchange wherever traditional, separate networks remain in existence.

In practice, the obvious difficulty will be to define what constitutes 'reasonable, non-discriminatory access' to the ability to design a communication platform. Past debates over 'open network architecture' or 'comparably efficient interconnection' foreshadow this problem. Broadly, we can imagine two extreme cases which mirror similar situations in past communication policy. In cases where, to repeat Pool's expression, 'obtaining access to the needed resources [is] no strain on ingenuity', policy intervention would be unnecessary. This is the case for example with the implementation of a business-to-business platform on the internet, where multiple providers offer the necessary components and ownership of the underlying network facilities counts for little in determining the marketplace's architecture. On the other hand, if access to essential facilities is restricted, policy intervention could be required to ensure open access to the key network components. At the very least, a weak form of such open access would be a mandatory disclosure of the network's architecture, so that biases in the

existing network platform are disclosed, and so that remedies can be sought. The current access debate surrounding high-speed cable internet is such an example (Bar et al., 2000).

Conclusion

We are not alone in pointing out the incoherence of today's communication policy, which maintains separate media governance in the face of media convergence. Others have called for a technology-independent approach to communication policy (Esbin, 1998), exhorted policy-makers to slice through the regulatory 'Gordian knot' by adopting a unified Open Communication Infrastructure (Neuman et al., 1997) or proposed new policy models for converging communication systems (van Cuilenburg and Verhoest, 1998). However, they have generally put forth technologically driven fixes, and stopped short of re-examining the fundamental goals of government intervention.

We took the reverse approach, and chose to start from the underlying motivation, rather than from the tension technology creates in the current policy system. This inquiry singled out promotion of the ability to design communication platforms as a crucial policy objective in the new converged communication environment. Moving from policy goal to implementation, our analysis implies that policy attention ought to center on the software configuration that defines the architecture of communication platforms. This contrasts with current policy, where the focus is primarily on governing existing platforms through regulation of ownership of the underlying physical network facilities – the conduit.

In the new converged environment, multiple communication platforms can be programmed onto interchangeable digital networks. Nevertheless, the architecture of these platforms remains critical as it continues to define which communication activities are allowed and which are excluded. Today, the key determinant of the platform is no longer the ownership of the underlying facilities, but rather the ability to configure their logical architecture through software. It is therefore critical for policy to realize that its inherited focus on the physical objects and the behavior of their owners no longer aligns with society's fundamental goals.

Notes

1. This meaning of 'foundational' follows Streeter's analysis of broadcast policy (1996: 116).

2. This idea of 'society's goal' is an idealized notion. There are also many other goals not addressed here. This article focuses only on access goals.

3. Technology is not autonomous or exogenous, but it is analytically useful to consider it separately.

4. Although many other factors were at work, including perhaps most importantly, an overall regulatory philosophy of corporate liberalism (Streeter, 1996).

5. On the distinction between cable television and print, see Memorandum Opinion and Order, Docket 18397, 23 FCC 2d 825 (FCC, 1969a) and First Report and Order, Docket 18397, 23 FCC 2d 825 (FCC, 1969b). On cable as a common carrier, see the 'Whitehead Report' (Cabinet Committee on Cable Communications, 1974).

6. This language, from a 1994 draft, was initially intended as an amendment to S.1822, but was rejected.

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