

**Universal service: beyond established practice to possibility space**

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March 2003

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A number of proposals have been put forward to reform universal service and make it compatible with the new competitive telecommunications environment in the United States. The diversity and apparent contradictions between these proposals makes the public policy dialog scattered and confused. This paper introduces the idea of a 'possibility space' delineated by two dimensions – 'intervention' and 'locus' – that lays out the contours of the emerging intellectual landscape by placing past practices as well as present proposals on the same conceptual plane. It suggests that the current approach to universal service reforms continues to be bound by the self-imposed limitations of a past regulatory era, and that a heterogeneous universal service policy is likely to be more suited to the new telecommunications environment.

Running Head: POSSIBILITY SPACE FOR UNIVERSAL SERVICE

Keywords: universal access, digital divide, information poor

**Universal service: beyond established practice to possibility space**

For a while, during the 1970s and 1980s, universal service had the bearing of a timeless concept. It stood like one of those eternal principles, such as the equality of all human beings, of which we had remained ignorantly unaware until a moment of revelation. For universal service, this moment was said to have occurred when Theodore Vail, the architect of the Bell System, articulated the ideal of ‘one system, one policy, universal service’ in 1907. When the winds of competition started blowing, the Bell System, the keepers of the flame, warned that the dismantlement of its regulated monopoly would snuff out the ideal. Even its critics, bent upon breaking up the Bell monopoly, worried about sustaining universal service in the post-divestiture environment. Although the adversaries disagreed on almost every issue, they all accepted universal service as an article of faith.

This certitude was shattered when Milton Mueller’s reconstruction of telephone history informed us that what Vail meant by universal service was very different from what it means to us today. Vail was talking about universal connectivity among networks rather than service for everyone (Mueller, 1993). We became mindful of the fact that universal service, like many other ideas, was a product of a contested and contingent evolution rather than an immaculate vision. The shape universal service was to assume eventually was not at all clear in the early stages of its convoluted evolution. By extension, universal service would have to undergo further mutation if it is to remain viable in a competitive environment. With a history and a future, universal service became a dynamic concept that had meant different things in the past and could take on various possibilities in the future.

While there is widespread consensus on the need for the ‘next generation’ of universal service, there is little agreement on what shape it should take. As discussed later, different observers have presented a wide array of possibilities for the future, ranging from vast federally coordinated universal service projects to localized community initiatives, and from a virtual cornucopia of information riches to the demise of universal service. In order to make sense of this emerging intellectual landscape, a conceptual map needs to be created that locates these competing visions of the future of universal service in relation to one another.

In this paper, universal service options are examined in terms of a possibility space within which policy innovations can take place. The possibility space is the repertoire of policy instruments or means offered at any particular point in time by the prevailing industry structure and available technologies. It will include the means that are well known, but by exploring along the contours of this space new options can be identified that are currently beyond our imagination. The main utility of the possibility space lies in its heuristic value. Its objective is not so much to identify a list of possible policy instruments, but to expose our self-imposed boundaries and to suggest new possibilities for universal service. Accordingly, a conceptual space generated by two dimensions—‘intervention’ and ‘loci’ can be visualized that situates the various universal service proposals within a single framework and thereby foregrounds the contours of the emerging intellectual landscape.

The following sections first discuss the multiple meanings attached to universal service over its convoluted history. The paper then reviews how each conceptualization of universal service emerged from within the possibility space delineated by the industry

structure and technology in each era of telecommunication history. It then considers the proposals for the future of universal service. This analysis sets the stage for conceptualizing the possibility space for universal service.

### **A heterogeneous concept**

In most historical accounts, Vail was credited with the visionary idea that all citizens should have access to telecommunications (see e.g. Dordick, 1991). But recently, Mueller (1993, 1997b) has argued that this conceptualization of universal service did not arise until much later. Vail's exhortation for universal service was limited to a call to set up a nationally interconnected telephone system, presumably under the control of the Bell telephone company, which would eliminate the need for dual telephone subscriptions from competing local exchange companies. Even the 1934 U.S. Communications Act, which is supposed to have mentioned universal service in a piece of legislation for the first time anywhere in the world, is filled with ambiguity. In its preamble, the Act announced the intention "to make available, so far as possible, to all the people of the United States a rapid, efficient, nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges" (1934 Communications Act, Title 1, Section 2). But it left terms such as 'available', 'adequate facilities', and 'reasonable charges' unexplained.

There is also considerable ambiguity about what services should be included in the universal service package. Initially, universal service involved only basic voice, but gradually the list was expanded to include other services such as long-distance service, directory assistance, and emergency services. Recently, there have been numerous

proposals to expand the definition of universal service to include new and advanced telecommunications services, such as e-mail or Internet access (Bollier, 1997; Compaine and , 1997; Information Infrastructure Task Force, 1993; Intelligent Network Task Force, 1987). The 1996 Telecommunications Act extended the concept to include education, libraries, and rural medicine.

International comparison reveals more divergence in the universal service idea. For example, the U.K. regulatory authority, OFTEL, declares its policy goal to provide “affordable access to basic voice telephony or its equivalent for all those reasonably requesting it, regardless of where they live” (quoted in Garnham, 1997). Canada promises to make telecommunications service “accessible to Canadians in both urban and rural areas in all the regions of Canada” (Canadian Telecommunications Act, 1993, Article 7(b)), while Mexico mandates that the telecommunications provider to “offer basic telephone service in all towns with more than 500 inhabitants” (Telmex License, quoted in Tyler, 1994, Exhibit 2.1). The European Union requires that “Member states shall, where appropriate, take specific measures to ensure equal access to and affordability of fixed public telephone services, including directory assistance for disabled users and users with special social needs” (European Commission, 1997, Art. 8). India makes the delightfully vague promise of “a telephone for all and a telephone within the reach of all” (Department of Telecommunications, 1996).

Thus it can be seen that universal service has come to acquire a variety of meanings over its almost century-long history. At various times, it has meant a fully interconnected national network; universal access for all consumers; a geographically ubiquitous service; service at ‘reasonable’, ‘affordable’ rates; subsidized access for

disadvantaged consumers such as rural users and the disabled; and so on. To make sense of the multiplicity of meanings of universal service, it is fairly common to differentiate between its two major dimensions, namely access and affordability. Sometimes, three dimensions have been identified: a geographical dimension ('geographical availability of the service'); a distributional equity dimension ('the accessibility and affordability of telecom services to low-income consumers') and a disability dimension ('accessibility, usability and affordability of service to disabled people') (Tyler, 1994: 16). In addition, a waiting list dimension was also mentioned. Similarly, Longstaff (1996) differentiated between physical access (the availability of service in a geographical area, at a price determined solely through market forces); economic access ('affordable' access, at a price determined through regulation), and access entitlement (entitlement to service irrespective of ability to pay). Another report identifies three aspects of universal service: scope (types, quality and speed of telecommunications services offered); affordability (the cost of service); and finance (rules for sharing the cost burden between all telecommunications players in the national market) (European Commission, 1996). These attempts at 'deconstructing' a very complex idea only accentuate the heterogeneity of goals subsumed under the concept of universal service, and the lack of consensus about what it actually means.

In the next section, the historical development of the universal service concept will be examined. It can be seen that the universal service concept that emerged in each historical period was located in a possibility space defined by a set of available policy instruments within the prevailing industry structure and technology. The specific position of universal service within its possibility space was a result of intense political

contestation between elements of the industrial-regulatory system. Also apparent is the way interest groups have used the universal service debates to support the regulatory status quo at times and instigate radical change at others.

### **Co-evolution of industry structure and universal service**

Broadly, the evolution of universal service in the United States can be divided into three stages or ‘paradigms’: network integration; regulated monopoly; and universal access in a competitive system.

#### Network integration

The Bell telephone company introduced the telephone in the U.S. as a monopoly provider as it had exclusive rights over the early telephone patents. When the Bell patents expired in 1894, a number of competing telephone companies (the independents) entered the market. Bell refused to interconnect with the new entrants, with the result that the entire subscriber universe in the U.S. was fragmented into several non-interconnected networks (Brock, 1981; Friedlander, 1995; Department of Commerce, 1975). Vail’s call for ‘one system, one policy, universal service’ was a reaction to this chaotic situation and aimed at integrating the fragmented subscriber universe. His vision did not include making telephone service accessible to all consumers as evident by the fact that he disdained to serve rural areas (Fischer, 1992; Friedlander, 1995; Gabel, 1969).

In order to secure full access to the subscriber universe, the Bell System wanted the government to permit it to acquire competing telephone companies in contravention of anti-trust laws. Not only that, the Bell System wanted the government to take an

activist approach—a conscious, publicly mediated policy decision to ‘unify the service’ “that is, to eliminate the user fragmentation created by dual service” (Mueller, 1997b, p. 9). In other words, this vision of universal service could be secured only with the full complicity of the government. The government’s response to Bell’s acquisition campaign oscillated between opposition and acceptance. Initially non-committal, the government soon became opposed to acquisitions and got Bell to make the Kingsbury Commitment of 1913 whereby it agreed to stop acquiring directly competing independent telephone companies (Barnett & Carroll, 1993). Significant market share thus remained with the independents until 1921, when the Willis-Graham Act again permitted the Bell System to acquire non-affiliated companies. Eventually, the percentage of subscribers belonging to systems not interconnecting with the Bell System fell to less than 1% by 1926 and the U.S. telephone system was converted into a de facto monopoly (Department of Commerce, 1975).

### Regulated monopoly

Though there was no explicit commitment to universal service in the 1934 Communications Act, the accounting system put in place by the policy initiatives and court judgments of that era indirectly helped universal service. Even in the 1920s, there had been growing debate about how to allocate the costs of the local exchange. State regulators who had an interest in keeping local rate increases in check, argued for the station-to-station method, which allocated parts of the local exchange costs to long distance service because the local loop was used for completing any telephone call. On the other hand the Bell System, later joined by the FCC, supported the board-to-board

system that would raise all local loop costs from subscriptions.<sup>1</sup> U.S. Supreme Court decisions in 1930 and 1933 supported the station-to-station principle. Nevertheless, the fundamental conflict of interest between the FCC which wanted to keep the long-distance rates low and state regulators who wanted to reduce local rates delayed the development of a national separations policy until 1947 when the Separations Manual was produced by the National Association of Regulatory Utility Commissioners (NARUC) and the FCC (Mueller, 1997b).

Even after the publication of the Separations Manual, there was no widespread recognition of the separations process as a way of keeping local rates low, and thus promoting universal service. Indeed, the percentage of local loop costs recovered from long-distance service as late as 1965 was less than 3% (Mueller, 1997b). But beginning in 1965, regulators began to gradually increase the cross-subsidies from long-distance to local service, aided no doubt by the substantial cost savings then being realized through the introduction of new technologies in interstate transmission. Thus the elaborate system of cross-subsidies and rate averaging that is now recognized as ‘classical’ universal service began to emerge. But it neither spring forth from deliberate regulatory design, nor at a specific point in time. Instead, it evolved over a substantial period through a heavily contested political-legal-regulatory process in which the Bell System, state level

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<sup>1</sup> As Mueller (1997b) points out, long distance services were much more lightly regulated than local service in the 1920s and 1930s. When a firm uses common facilities to produce goods or services for both regulated and unregulated markets, it has an economic incentive to allocate as much of the common costs to the regulated market (in order to substantiate demands for higher rates).

regulators, the FCC, advocacy groups, and the courts played prominent roles. It is important to note that the relatively small number of influential interest groups involved and the broader revenue base (and consequent financial flexibility) of the monopolist made adjustments and accommodations possible, allowing for the incremental movement towards universal service. The need to justify a monopoly provided the impetus and the possibility of internal cross-subsidies within an integrated system provided the means for universal service. Oettinger very succinctly describes the process leading to the development of universal service:

AT&T's Theodore Vail spoke about the idea of universal service around 1907. The idea was written into the preamble of the Communications Act of 1934, but there is very little legislative history on why and how it got in there. And, even though the words were grand, nothing really happened until around 1945. By then, penetration of telephones, which you described as being almost 95 percent these days, was only about 40-50 percent. So after 40 years of rhetoric, universal service as we now know it came into place somewhere between 1945 and the early 1960s, by which time we had begun to dismantle the apparatus which brought it to us in the first place. (Oettinger quoted in National Governors' Association, 1988, p. 1)

Interestingly, in many ways, the vision for universal service was reified after the 'objective' was accomplished. The Bell System became acutely mindful of the universal service mission when competition and antitrust lawsuits threatened to unravel its monopoly. Now, universal service became a useful defense for the preservation of the status quo. Aided by Bell sympathizers and even some consumer advocates worried about the implications of competition for affordable access, universal service came to

acquire a long historic pedigree stretching right back to Vail's original declaration, far beyond its actual existence. Considering the turn of events, the 're-scripting' of the universal service story is not unexpected. As Hirschman (1967) observes,

While we are rather willing and even eager and relieved to agree with a historian's finding that we stumbled into the more shameful events of history such as war, we are correspondingly unwilling to concede—in fact we find it intolerable to imagine—that our more lofty achievements, such as economic, social, or political progress, could have come about by stumbling rather than through careful planning, rational behavior, and the courageous taking up of a clearly perceived challenge (p. 14-15).

#### Universal access in a competitive system

The challenge to the universal service arrangements that had evolved within the regulated monopoly framework, when it eventually arose, came from economics. By this time, the cross-subsidies from long-distance to local service and from urban to rural areas had created substantial differences between the prices charged and the actual costs of providing service on heavily used routes. At the same time, the corporations found themselves spending ever larger amounts on telecommunications in an increasingly information intensive economy. Seeing an opportunity to avoid artificially inflated costs on the public telephone network, corporations started using microwave and other new technologies to create their own private networks. The migration of high-end consumers off the public network reduced the universal service pool. The system of cross-subsidies was further undermined by the entry of new players like MCI who cream-skimmed by

targeting high traffic routes. These problems were intensified manifold by the 1983 breakup of the Bell system.

The resulting separation of the local and long-distance networks into separate operating entities created threats at two levels for the traditional universal service system. One, it set up a conflict of interest between local exchange and long-distance providers, making access charges a highly charged issue. Two, competition in long-distance eroded the available monopoly surpluses in that segment. Thus, long-distance providers lost both the incentive and increasingly, the means to cross-subsidize local service.

Regulators have responded to this threat by setting up new funding mechanisms for universal service. These mechanisms continue to subsidize local service and rural areas by diverting monies from long-distance service and urban areas. They are different in that now the transfers occur in a transparent or explicit way. Furthermore, these funding mechanisms seek to maintain competitive neutrality. Regulators have been concerned that payments into a common Universal Service Fund (USF) for instance, should not burden any service provider unfairly vis-a-vis any other provider.

A fundamental problem confronting the 'new' universal service is the incompatibility between the need to preserve universal access, and the legislative directive to ensure competitive neutrality. In the previous regime, subsidies for local access were channeled through the incumbent LEC, who was in return required to serve as the carrier of last resort. With the transition to competition, three issues related to funding mechanisms have come to the forefront: the identification of the carrier of last resort, the source of contributions to the universal service fund and the eligibility of carriers to receive universal service funding.

The identification of the carrier of last resort is not especially challenging in the initial stages of the transition to a market-based system. The incumbent enjoys a market advantage compared to a new entrant, making it legitimate to burden the former with carrier of last resort responsibilities. But once the transition is well underway, those advantages are lost making carrier-of-last resort obligations an asymmetric restriction on the incumbent's ability to compete with new entrants. Alternative mechanisms have to be used to identify carriers of last resort.

A second problem is determining who should be liable to make contributions in support of universal service. Section 254 of the 1996 Telecommunications Act specifies that all interstate telecommunications carriers shall contribute to a universal service fund. But long-distance services can now be provided by non-traditional means such as Internet telephony or by cable companies. Under the current dispensation, ISPs providing Internet telephony are not liable to make universal service contributions. Frieden (1998) has argued persuasively about the threat to universal service if a substantial portion of current long-distance traffic migrates to Internet telephony. The LECs insist that ISPs too should be required to contribute to the USF, and receive subsidies only if they satisfy the criteria for eligible telecommunications providers stipulated in Section 214(e) (Foley, 1998).

With regard to the eligibility to receive universal service funding, the Telecommunications Act states that payments from the universal service funds will be available to telecommunications carriers providing local access. While this system is essentially a continuation of the traditional cross-subsidies under 'classical' universal service, it becomes problematic in the new pluralistic telecommunications environment. When local access can be provided over a variety of alternative means, such as wireless

or cable telephony, using universal service contributions in aid of wireline providers alone is in many ways a violation of competitive neutrality. Competitors using new technology to offer local exchange services argue that depriving them of access to universal service subsidies is a restriction on their ability to compete (see Ayotte, 1999). The LECs on their part complain bitterly about the use of universal service funds to subsidize the services offered by any of their competitors, for example Internet connections to schools provided by the Internet service providers (ISPs).

What can be witnessed over the last two decades is the gradual stretching and tearing of a universal service system first articulated in the 'classical' period as its foundations shifted and drew apart. In post-divestiture era, internal cross-subsidies became impossible as local exchange and long-distance operators became separate corporate entities. But policy-makers continued some cross-subsidies in the form of access charges, making up the deficit from the customer. But this solution, though generating its own set of problems, was still sustainable because there was a monopoly local exchange provider through whom universal service could be channeled. The competition provisions in the 1996 Telecommunications Act and the technological and business developments of the late 1990s were further shocks to an already shaky system. But policy-makers have sought to sustain the status quo in the new environment. Their attempts to maintain the classical paradigm have begun to look increasingly like 'band-aid' solutions that cover up internal contradictions. Sooner or later the old edifice will have to be abandoned and our approach to universal service rethought afresh. But what may be the blueprint for a new system? The next section examines some of the proposals for universal service put forward by different scholars.

**Proposals for the future**

In light of the various problems confronting the current system, several proposals have been put forward for the future of universal service. To ensure competitive neutrality on the supply-side, they have sought to design new mechanisms for selection of primary universal service providers that do not bias the process towards one carrier or another. Auctions, in particular, have attracted much attention.

Nett (1998) presents a set of general operative principles for auctions, and provides pointers for their effective design. According to Nett, the incumbent provider should have the option of deciding whether or not to continue as the universal service provider. When the incumbent provider is not interested, the regulator should approach other providers and see whether any of them is willing to take up the universal service obligation without any compensatory payment. If there are no takers, the obligation should be auctioned. Weller (1999) goes into more specifics, and recommends a single-round, sealed-bid auction that asks carriers to bid subsidy support per subscriber for universal service in a small, well-defined geographical area. Peha (1999) suggests a further refinement to the auction process: tradable universal service obligations. Once the initial allocation of universal service responsibilities is made through an auction process, Peha argues that the obligations should be made tradable between telecommunications firms. Each obligation should have a targeted objective to provide a specific service (a milestone), within a specific deadline (a commitment). Furthermore, milestones and commitments themselves should be made independently tradable. Hypothetically, a firm

confronting problems with the implementation of a project will be able to purchase a later completion deadline (by trading a commitment), or to take on another objective with the same deadline (by trading a milestone), or to pay another provider to take on the whole obligation. Peha argues that such a flexible trading regime will result in the most optimum allocation of universal service obligations, with each firm putting together a bundle of milestones and commitments that it can provide most efficiently.

In general, auction proposals leave most of the essential features of the current universal service system in place, but with new mechanisms for determining the carrier of last resort and the quantum of universal service subsidies. Proponents of auctions do not question the need for specifying a carrier of last resort, who will be obligated to serve all customers that request service. The underlying assumption in the auction proposals is that carriers may be tempted to cease serving customers with the lowest profit margins in the absence of a legally enforceable obligation to serve. Auction advocates also believe in the continued need for subsidizing local access. They assume, and perhaps correctly, that strong political-regulatory pressure to maintain low residential rates will forestall full rate re-balancing. The advantage of auctions is that they transfer the burden of determining the costs of providing service (on which the determination of the appropriate level of universal service support is based) from the regulator to the firm providing the service.

Proposals to ensure competitive neutrality have also focused on the demand-side. One such proposal is virtual vouchers (Bonnett, 1999). Their proponents seek to redirect the flow of high-cost area subsidies away from the service providers to the subscribers that live in that area. The amount of the voucher would be equal to the difference between the average statewide subscription price and the actual cost of providing service.

The customer in turn would identify the service provider from whom he or she wants to get service, and the voucher payment will be made to that carrier. The virtual vouchers is similar to existing targeted subsidy schemes like Lifeline, which provide directed subsidies to low-income subscribers or to subscribers in high-cost areas. But the difference is that the virtual voucher payment can be directed to *any* service provider active in the area, at the discretion of the customer. It is this provision that makes the proposal more suitable for a competitive marketplace.

A related proposal, but one that moves much farther away from the present universal service paradigm, is Mueller's (1997a) notion of card-based access. He argues that with the proliferation of new technologies like wireless, physical access to the telecommunications infrastructure is no longer the decisive factor in universal service. The real issue is the accounting relationship between the customer and the provider in the absence of which the former will not be able to access services even when the service portals are physically close by. Mueller argues that a 'third generation' universal service policy will be based on the sort of client-provider relationship established through a credit card, with all attendant opportunities and risks. While the card-based access provides unprecedented opportunity for account portability, flexible use and convenience, it also runs the risk of consumer credit default and provider non-performance. What makes this proposal particularly amenable to competitive neutrality is that the proposed mechanism routes the subsidy directly to the customers instead of going through a carrier.

If auctions and virtual vouchers proposals have sought to make universal service compatible with the imperatives of competition, a number of proposals have urged redefinition of universal service to include new services (Bollier, 1997; Compaine and

Weinraub, 1997; Information Infrastructure Task Force, 1993; Intelligent Network Task Force, 1987). For example, Milne (1998) mentions a Swiss proposal to include a mobile phone for every citizen among that country's universal service obligations. On the other hand, Sawhney and Jayakar (1999), drawing on the history of universal education, argue that an a priori definition of universal service is not a necessary condition for the development of universal service in advanced telecommunications. They point out that the development of universal education continued in spite of the fact the various stakeholders such as legislatures, religious groups, and courts could not agree on the definition of a basic concept like the 'public school.' They urge a decentralized bottom-up approach where innovations that occur at the local level are later harmonized into an integrated policy framework with local variations in each jurisdiction.

Hart (1998) considers the possibility that the higher levels of universal service may not be introduced in all parts of a country or region simultaneously. He discusses the situation in the European Union where countries with high levels of telecommunication development (such as the U.K. and Germany) exist side by side with countries with much lower levels of development (such as Portugal). Hart visualizes three different universal service classes: a basic high quality service class, a state-of-the-art service class, and a broadband-for-all class, with performance criteria specified for each. Countries and regions will be placed in classes whose performance criteria they meet, and obligated to achieve the targets for the next higher level. This proposal is noteworthy because it is a departure from the traditional notion of universal service that visualizes a uniform universal service package throughout a political-regulatory unit.

Sawhney (2000) argues that while uniformity in the provision of universal service

resonates with our notion of information egalitarianism and provides a convenient, controversy-free benchmark, it can lead to wastage because information resources are valuable only when the intended beneficiaries have use for them. Hence the level of service that is uniformly provided should be carefully thought through. In order to develop criteria for deciding what resources should and should not be provided uniformly, he offers a conceptual framework that distinguishes between the two ways in which people use networks: communication mode (person-to-person interaction) and information access mode (human-machine interaction). He recommends that the consumption norms<sup>2</sup> in the communication mode, where adoption of a technology by one's acquaintances encourages adoption by oneself, should be used as a benchmark for the bare minimum service that should be provided uniformly. Since the same platform is used for both modes, the intended beneficiaries will also be able to use this bare minimum service for the information access mode.

Schement and Forbes's (1999) Informed Choice Model (ICM) of universal service makes several interesting proposals. Unlike the emphasis most conceptualizations of universal service place on access to a particular delivery mechanism, the ICM privileges the ability of individuals to send and receive information at reasonable price through any delivery channel of their choice. It emphasizes mobility as the key element in access—both in terms of the ability of individuals to pick and choose from a variety of delivery channels to communicate and to exercise that choice from practically anywhere.

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<sup>2</sup> A consumption norm is the bare minimum that the poorest citizen needs to function in the society. It is a function of the overall wealth of the society (Preston & Flynn, 2000). Today, an automobile is a consumption norm in the U.S but not in Mali.

The ICM thus moves away from access from a fixed location such as a household telephone that is at the core of ‘classical’ universal service, in favor of account-based access from a multiplicity of locations where public terminals to information conduits will be made available. Finally, and most significantly, it emphasizes the element of choice in services as well—the ability of individual users to choose the combination of services they want to access, and to apply any subsidies for which they are eligible to this unique subset.

Other scholars have advocated government support for community level initiatives that provide services in small communities bypassed by the mainstream telecommunications providers. They feel this targeted approach will provide assistance where it is needed and yet avoid the market distortions brought about by broad-based regulatory initiatives (Parker, 2000; Lentz, 2000). Hudson and Pittman (1999) highlight the role of state-level initiatives in improving telecommunications access for rural and disadvantaged population segments in their work on the ‘Alaska model’ of network deployment: specifically, they discuss the role of satellite technology, targeted subsidies and creative network design in making services such as telemedicine, distance education and government access available to isolated communities. Elsewhere, Hudson (2001) has discussed the problems in assessing the impacts and effectiveness of local initiatives such as telecenters in providing telecommunications access to developing regions.

Finally, there is a school of thought that argues that universal service programs have outlived their utility, and are no longer relevant or necessary in the emerging telecommunications environment. There are several variants of this basic position. The first questions whether gaps in information technology access and usage actually exist

between whites and minorities, men and women, and urban and rural residents. These studies claim that such gaps are only transitory and will disappear (and indeed are presently disappearing) in the course of technology diffusion (see Lentz, 2000, for a survey of the authors who have taken this position). Another variant acknowledges that an information technology gap exists, but that it is a natural outcome of factors such as wealth, income, age and education, which does not require any special remedial action by government (Compaine, 2001). This position is epitomized in the recent comment of FCC Chairman Michael Powell comparing the ‘digital divide’ to a ‘Mercedes divide’ (Washington Post, 2001). Some media commentators too had previously expressed this viewpoint (Browning, 1996). Browning argues that it may be time “to bury universal service—to bury it slowly, gently, and with great care to preserve both its spirit and its many achievements” (online).

While each new proposal has something new and interesting to offer, collectively they are scattered all over the conceptual map. How do they relate to each other and to the prevailing model of universal service? Are they competing or complementary proposals? Is it possible that they could be reconciled in a new vision for universal service, into which their useful features would be subsumed? Or is such reconciliation both impractical and unnecessary? To answer these questions, a conceptual schema is needed that holds all these disparate proposals together within a single framework and provides a panoramic view of this emerging intellectual landscape. In the next section, the conceptual contours of the debate are examined so as to create one such schema.

### **Conceptual contours of the debate**

In the earlier phases in the evolution of universal service, the debate was limited to the technocratic elites and the regulatory establishment. The regulators worked out agreements with telephone company representatives that supposedly served the public interest. The public itself had little say, and perhaps interest, in the deliberations. The situation changed dramatically with the breakup of the Bell System. For one, there was greater awareness of telecommunications in an increasingly information intensive economy. For another, the spectacle of the breakup itself attracted attention and raised concerns about corporate machinations and back-room deals. While many concerned voices rose, they sought the same thing—preservation of the prevailing system of universal service. The multiplicity of voices did not lead to a plurality of ideas because the thinking was confined to the entrenched paradigm. The effort was directed towards shoring up the established order rather than breaking new ground.

With the technological, business and regulatory changes of the 1990s, the situation changed dramatically. As the previous section shows, a wide variety of ideas for the future of universal service are now being presented. While it is difficult to predict what will be the nature of universal service in the next phase of its evolution, an understanding of the underlying dimensions of the ongoing debate will provide some guidance for the actions we undertake today in anticipation of the future. Accordingly, this section maps out the conceptual contours of the current debate.

To begin, a possibility space may be visualized comprising all the policy instruments, mechanisms, initiatives, innovations or means available to regulators at a given time, given a particular industry configuration and technological development. In broad conceptual terms, this possibility space has two fundamental dimensions—

‘intervention’ and ‘loci.’

The first dimension, intervention, refers to the instruments employed by policy makers to effectuate universal service goals. The intervention is said to be ‘direct’ when the policy makers issue overt policy statements or directives with which the service providers have to comply (e.g., separations rules) or undertake policy actions specifically coupled with a policy goal (e.g., direct Lifeline subsidies to low-income households). Conversely, the intervention may be said to be indirect when policy makers rely on market mechanisms (e.g. auctions) to achieve their policy goals. Policy-makers still try to further policy goals, but more subtly by changing the rewards and incentive structures for market participants. Direct interventions tend to narrow choices or latitudes of action for consumers and service providers—which may not always be a negative, because it can help coordinate markets or enable convergence onto a standard or a service package. Indirect interventions tend to expand choice and allow the exercise of judgment. In sum, direct interventions are prescriptive of movement towards policy goals, while indirect interventions are facilitative. The former dictates while the latter guides.

The second dimension, loci, refers to the point in the system at which the policy makers direct their intervention. The ‘core’ represents the heart of the system—the service providers. The ‘fringe’ refers to the subscribers, both residential and corporate, and the equipment they own. Both dimensions represent continuums as the locus of a policy intervention can vary and it could be directed at the core or the fringe or any point in between (e.g. resellers). Together, the two dimensions create a conceptual space of heuristic value.

If various conceptions of universal service, both old and new, are located on this

conceptual space, an interesting pattern can be seen. The older conceptions of universal service lie in the first quadrant, where the interventions were direct and the locus was the core. The newer ones, on the other hand, are all over the map. This pattern highlights two noteworthy points about the evolution of universal service as an idea. One, in spite of their very significant differences, the first three phases of universal service operated within the same parameters—direct intervention, located at the core. Two, while it difficult to predict what the future entails, the new ideas scattered over first, second, third, and fourth quadrants seem to signal a paradigm shift in the next phase of universal service evolution.

(Figure 1 somewhere here)

These hints of an impending change seem credible. If anything at all can be generalized from the history of universal service, it is that when the universal service idea is in conformity with the prevailing industry structure, it contributes to the stability of the regulatory system, but when it is not, it serves to set the stage for regulatory transformation, in combination with political, economic and technological factors. Quite clearly, as the previous section on the co-evolution of industry structure and universal service shows, there is a misalignment between the existing system of universal service, a carry over from another era, and the prevailing industry structure. So, it is quite reasonable to expect a major paradigm shift.

However, as noted earlier, it is difficult to predict what shape universal service will take in the future. The new policies will be a product of a far more contested process than in the past because of the presence of many more players in the policy arena. While it is foolhardy to predict the specifics of future universal service policies, it is quite

possible to observe the changes in the policy arena within which the policy choices are likely to be made. Earlier, as illustrated in Figure 1, the arena of action was restricted to the conceptual space represented by the first quadrant. The ideas proposed, considered, and accepted were restricted to direct interventions, located at the core. In the future, the arena of action is going to be in the conceptual space represented by all the four quadrants, with the activity particularly intense in the second, third, and fourth quadrants.

### **Implications for the future**

The ‘classical’ universal service model had been the entrenched paradigm for a considerable period of U.S. telecommunications history. The core assumptions of this model have been undermined by technological and business innovations, and the demise of the Bell System. But it still continues to exert a strong influence on current universal thinking. The analysis in the preceding section suggests that the scope of our thinking needs to be expanded to newer realms of possibility. While it is difficult to completely fathom the potentialities of the expanded possibility space, quite clearly our thinking need not be constrained by the entrenched paradigm. So, at the very least, the root assumptions underlying the Quadrant I mindset need to be re-examined. Accordingly, the following section identifies the key Quadrant 1 assumptions, re-examines their validity in the new environment, and considers the mindscapes that can be opened up by transgressing these self-imposed boundaries.

Assumption 1: The regulator must foster and leverage the core’s fiduciary relationship with the fringe to secure universal service.

This assumption is a carryover from the regulated monopoly era. As the story of

the Bell System shows, a regulated monopoly has an uneasy presence in a society that celebrates the ideals of a free market. One way a regulated monopoly can justify its existence is by very visibly contributing to the public good. This ‘trusteeship’ principle surfaces again and again in regulatory approaches to diverse industries—non-discriminatory access for transportation common carriers and the public interest, convenience and necessity standard for broadcasting. The regulator, so as to attain public policy goals, needs to cultivate this principle and leverage it for socially beneficial purposes. Universal service, which developed incrementally both as policy and as ground reality, was a product of this peculiar dynamic.

As a result of this history, the Quadrant 1 mindset sees universal service as a regulatory contract that needs two principal partners—the regulator (planner) and the regulated (implementer)—and policy is defined, operationalized, and implemented through a process of negotiation between them. This is not to say that other entities did not have a place at the table, or that their opinions did not count, but the regulatory contract under Quadrant 1 was primarily a give-and-take between the regulator and the regulated entity. The regulator’s use of the core as a vehicle for universal service made practical sense because of two rationales. One, it was far more efficient for the regulator to deal with the few parties that constituted the core than the numerous members of the fringe. Two, in the POTS era, the fringe’s involvement was not critical because the core’s output was basically a standard voice telephony service.

Both these rationales have ceased to support a core-centric approach in the new environment. Let us take up both in turn. First, there are many more actors in the core today, and with strikingly different agendas, than at any other time in history. The

increasing plurality within the core creates its own complications. When local access can be provided over a variety of alternative means, such as wireless or cable telephony, using universal service contributions to support a single technology platform (wireline) is a violation of competitive neutrality principle. Correspondingly, continued dependence on contributions from long-distance telephone companies becomes problematic when their new competitors like Internet telephony providers are exempt from universal service obligations. With time, the regulators will find it increasingly difficult to mediate disputes within the core itself and that will impel them to devise competitively neutral mechanisms, not necessarily always the market place, which leave the choices to the more numerous and dispersed.

The second rationale for a core-centric approach was the uniformity of the end product, namely plain old telephone service (POTS). Because there was no dispute about what universal service policies ought to deliver to consumers, standardized solutions could be implemented nation-wide. The proliferation of new services makes the provision of a standardized solution difficult. Sheer economics rule out the possibility of providing all the available services to all the people on a uniform basis. If the alternative is to settle for a small subset of services, the criteria for including or excluding services in the universal service package become an issue. Consensus on this issue has eluded us to date and there is little to suggest that we will eventually succeed in the future. On a different level, mere provision of a service will do no good if the intended beneficiary does not use it for lack of either need or skill. Thus, in the new multi-service environment, the involvement of the fringe is necessary. As a result of these structural changes, the locus of policy interventions is likely to shift away from the core towards the fringe.

The core-centric perspective privileges efficiency and thereby order and uniformity. The vista is very different when universal service is viewed from the fringe-centric perspective. Great diversity can be seen in the needs of the people. The situation cries out for the antithesis of the uniform solution: customized solutions. While economics may preclude the possibility of customizing solutions for individual customers, we should do the next best thing—segment the population. That is, micro-solutions for specific population segments, geographical regions and professional groups need to be developed. Marketers have for years productively employed segmentation to identify groups of customers with similar needs. There is no reason why the same cannot be done for universal service programs. Actually, we already have targeted programs like Lifeline, Link-up, and others. But they are more the exception than the rule. Our fixation with uniform service provision is perhaps the biggest shackle on our imagination with regard to universal service. We need to break out of this box.

Assumption 2. The regulator can identify points of intervention and set up incentive structures that guide the core along the path to universal service.

Network externalities have been used to make a compelling case for universal service based on its potential to maximize social welfare. But a service provider, who is only interested in private utility maximization, may stop well short of the socially optimum level of telecommunications penetration unless the regulator is able to provide additional incentives to achieve that goal. Under Quadrant 1, regulators assumed that the incentive gap between the private and the socially optimum could be correctly identified and bridged through policy action.

During the regulated monopoly era, the regulators working with the Bell System devised a complex system of cross-subsidies that furthered universal service. The introduction of competition unhinged this arrangement. Now that protection from competition was no longer a given, the government had to find other incentives for service providers to continue providing universal service. Funding support from long-distance access charges, direct subsidies from the universal service fund, and subscriber line charges were all methods to bridge the gap between the socially and privately optimum levels of telecommunications service output. But the regulator's continued ability to provide sufficient incentives for universal service in the Quadrant 1 mode is uncertain because of the increasing plurality within the core. Also, the points of intervention themselves are proving to be difficult to identify in a core that is in a perpetual state of flux. Furthermore, the telecommunications environment is now much more dynamic and complex for goal-driven anticipatory policy-making. As a result of these changes, the regulators are finding it increasingly difficult to anticipate changes in the telecommunications marketplace, and plan for them with sufficient information, analytical ability and foresight.

One of the defining characteristics of the Quadrant 1 mindset is the tight coupling between the 'ends' and the 'means'. Here the regulator feels compelled to not only articulate the goals of universal service but also to design the mechanism for achieving them. So much so, within this logic, a proposed 'end' does not acquire legitimacy until the proposer also comes up with the appropriate 'means' for achieving it. This mode of thinking was a responsible way of dealing with universal service issues when the core was a monolithic system with its tightly defined capabilities and constraints. However, in

a situation where the core is pluralistic and there are multiple of means of achieving the same ends, our imagination should not remain constrained by Quadrant 1 assumptions. Today, in a pluralistic environment, ends should not be regarded as “‘instructive’, in the sense that from them can be deduced a correct, much less the only correct, means of attaining them” (Luhmann, 1971/1982: 26). From the ‘non-instructive’ ends assumption, it can be seen that a particular definition of universal service goals does not naturally suggest the means for achieving them. Instead, several alternative courses of action are available at any given time, the choice of which depends on the technologies and institutional forms arrayed in the arena.

In the new environment, the regulators should focus on the articulation of the goals. They should leave the creation of the mechanisms for their achievement to the service providers. The process design challenge is no longer the means of furthering universal service but the mechanism for selecting the service providers. Auctions, the method often mentioned in the literature, are an effective mechanism. Here, on one level, the regulator selects the service provider and yet, on another level, the service provider self-selects the projects it finds interesting and thereby worthy of a bid. On another front, the regulators could encourage and support grassroots proposals like those for community networks. As Hudson (1994) points out, there is need for universal service to move beyond individual access to ‘community access’ and ‘institutional access.’ Since the entire regulatory apparatus has been geared towards the core, the regulators will have to develop a very different approach for grassroots proposals. Here they would have to operate in a nurturing mode. Communities may need advice and assistance with community information resource inventory and planning, needs assessment, project

implementation, budgeting, training, and impact assessment. Policy-makers could provide resources, both monies and technical inputs, via special funds for grassroots efforts.

Beyond specific projects, the regulators should try and educate and empower the fringe since their participation will be critical for the success of universal service programs. In the Quadrant I regime, the fringe was seen as a passive beneficiary of subsidized service. In the second, third, and fourth quadrant approaches the fringe will have to be accorded a more active role as co-creators of universal service—the choices they make will determine the social payoff of the monies spent on universal service.

## **Conclusions**

Although the scientists have repeatedly told us that there is nothing inevitable about evolution, the term evokes the imagery of a path—a series of sequential stages linearly connecting the past to the present and continuing into the future. In the case of universal service, the progression from the past to the present can be retraced as a linear path even if we accept the fact that there was nothing inevitable about the entire process. Looking ahead, the diverse writings of the researchers seeking to articulate the ‘next generation’ of universal service appear on the surface to be beset with confusion and lack of coherence. Accordingly, there have been repeated calls for forging a consensus. The above analysis, however, suggests that the scattered writings are not indications of lack of clarity but a sign of things to come. Metaphorically speaking, the linear evolution of the universal service concept has exploded into multiple genealogies or a greatly expanded possibility space.

The possibility space generated by the two dimensions—‘loci’ and ‘intervention’—is noteworthy on two accounts. One, it holds all the different universal service proposals on the same conceptual ground and thereby lends an underlying coherence to what on the surface appears to be scattered ideas. This conceptual coherence suggests that universal service need not be a single strategy. It could be a suite of strategies that employs first, second, third, and fourth quadrant approaches in the most optimal way. We should therefore change our mindset from a competitive comparison of the relative merits of each proposal as if they were mutually exclusive alternatives, to one that looks for complementarity among them. Two, it reveals a certain consensus on the directionality of change even when the individual proposals vary considerably. The locus of policy interventions is likely to shift away from the core towards the fringe and the modality from direct to indirect. Accordingly, we need to suspend the Quadrant 1 assumptions and explore the expanded possibility space. Among other things, we need to overcome the notion that universal service should be uniform service and ends must be tightly coupled to the means.

The intention of this paper is not to predict the future, but only to facilitate a forward movement. Its purpose is to loosen the hold of long-held assumptions on our imagination, so that a much larger possibility space opened by the technological and institutional transformation in telecommunication can be explored. It is hoped that the schema provided in this paper will both motivate and assist such an exploration.

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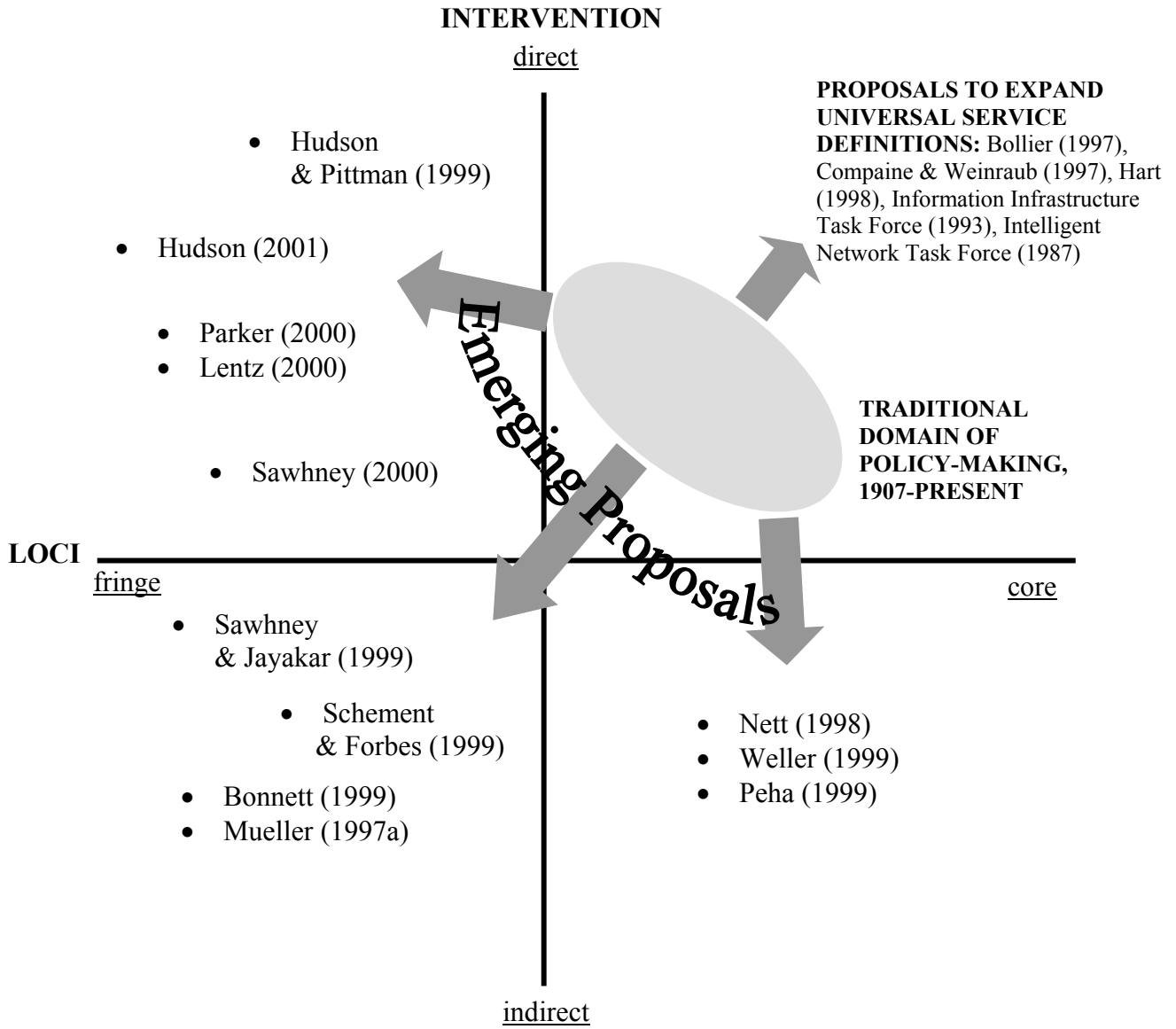
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**CAPTION FOR FIGURE 1**

**Universal Service Possibility Space**



(Figure 1)