

UNIVERSAL SERVICE IN AN INFORMATION SOCIETY

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Introduction

Universal service is a noble concept that, for almost all of its history and current practice, has been, and is being used opportunistically as a stalking horse for other purposes. More often than not, these other purposes have been in direct conflict with an objective of actually achieving a universal service. In telecom, with the exception of the Nordic countries, it took Europe almost a century to recognize that universal service was fundamental to economic and social cohesion and development. And at a global level, universal service is notable only as an embarrassment, as 70% of the world's population has no access to a telephone. This paper looks behind the universal service rhetoric with a view to examining its economic underpinnings and its potential role in an information society, in the event that it is taken seriously as a cornerstone of information society development.

History

The term universal service was coined by Theodore Vail, chairman of AT &T during the period of its formation in the USA during the early years of the twentieth century. His solution to the lack of interconnection between competing telephone companies was to create a single interconnected system, ie., a universal service. This meant monopoly, and AT &T lobbied state legislatures for many years to get regulation established that would authorize telephone monopolies as supplying a universal service, subject to reasonable terms and conditions approved by government regulators. There was no intention to serve people in outlying rural or unprofitable areas. Thus the initial conception of universal service was far different than its common conception today.

With the passage of the Communications Act of 1934, the objective of providing service to everyone "to the extent feasible" was adopted in the USA. But even then universal service was not achieved through the established telephone monopolies, but rather by the initiative of those in unserved areas who, with various kinds of support, supplied themselves. Even with special financial incentives from the government, the established telephone monopolies could not be stimulated to extend their networks to provide a universal service. In 1940 only 25% of farm residences in the USA had working telephones. The major stimulus to universal service development in the USA, first in electricity and then in telephone was the Rural Electrification Administration (REA), established by the federal government to provide low cost

loans, technical support and training for the development of local systems in unserved rural areas. These were developed in the form of local private companies, municipal operators, cooperatives and farmer lines, where the rural residents provided a major portion of the labour. In the process the REA pioneered technologies to better serve rural areas. By 1990, 94% of all farms were served by telephone.

The experience in Canada was similar. The telephone monopolies serving the cities and providing the long distance and international services could not be induced to extend their networks to provide a universal service. It was developed through similar programs of government support of local initiative, ranging from a province - wide cooperative in Saskatchewan to farmers stringing telephone wire along their fences. Following this approach Canada achieved one of the highest universal service penetration rates in the world in a country with one of the lowest population densities.

Australia stands out as perhaps the only country that has achieved a universal service through the established national monopoly public telephone operator (PTT or PTO). Ironically, this may be directly due to the fact that the country, like Canada, is so large and has had such a low population density. In the development of universal service, Telecom Australia (now Telstra) adopted policies and practices one would associate more with a giant cooperative than a PTT.

In Europe there is no evidence that universal service was ever a part of national policy or PTT practice until recently. Here also universal service in practice was only achieved during the telephone era in the countries with the thinnest population densities and most difficult conditions, the Nordic countries. And for the most part it was done by local initiative, sometimes but not always with federal government support.

For the rest of Europe, service provision lagged far behind demand. As Garnham has noted, operations were governed by the convenience of the public service, ie., the government, which had no special obligations to provide universal service, but did have special legal protections against demands by the population for service to be provided. Universal service in Europe became an issue when telecom liberalization came on the policy agenda. It was raised most forcefully by the national PTTs who had never provided universal service. It was raised not in the context of a plan to start providing universal service, but rather a reason for preventing competitors from entering the traditional PTT monopoly marketplace, which extended to areas and services that the PTTs did not provide. This argument, of course, had been raised earlier by AT &T in the USA and Bell Canada in attempting to resist liberalization of their monopolies.

It seems there are two important lessons to be drawn from this history. The first is that the recent debates over universal service have been used primarily as a device to slow down the liberalization process in Europe. In fact, if there is a serious commitment to universal service, that is a reason to speed up liberalization, not slow it down.

Whenever competitors appear on the scene, markets are extended. More people are served, not fewer. For eg., after liberalization in the UK, the telephone penetration rate went from about 60% to 85% in a decade, driven mostly by the discovery of BT that this was all profitable business. In the USA (including Alaska) and Canada, there are many similar

experiences. Competition expands universal service coverage. It does not restrict it.

The second lesson is that if policy makers seriously want to achieve universal service, it is not likely to be achievable efficiently, effectively or timely, if at all, the national PTO is the only vehicle for implementation. For the best results, the local people in the unserved areas should be directly involved and not beholden to the PTO. Finally, it should be recognized that among the developed countries, universal service has been achieved in those countries where it is most difficult and expensive to achieve. It is a problem only in those countries where achievement is less difficult.

Given the technological and service improvements in telecom in recent years, universal service should not be a difficult objective to reach rapidly for the remaining European countries. If there is a serious commitment to universal service, it is readily achievable. However it is more likely that universal service remains primarily as a tool in the more important debate for the former PTTs about the pace of liberalization of "their" traditional monopolies. Now that the EU liberalization policy is in effect from 01.01. 1998, universal service will be an important issue to slow down and restrict the spread of potential competition. Once universal service is no longer useful for this purpose, it may fade from the public policy agenda.

Subsidies and Network Economics

The reason universal service is an important issue in liberalization debates is because it could affect the costs of supplying service for different competitors and thereby provide a competitive advantage or disadvantage to particular competitors. The concern of the national PTOs is that, if they must provide universal service and the new competitors do not have to provide it or help pay for it, the PTO will be placed at a competitive disadvantage. It will have to subsidize the high costs of universal service from its profitable services that are subject to competition.

The significance of this issue depends upon the size of the universal service subsidy. In most countries where independent studies have been done, the subsidy has been found to be relatively small. In Australia it was found to be about 2% of the revenues of the PTO. In the UK, for fiscal 1996/97 it was between 0.8-1.6% of BT's domestic turnover. In Denmark and Finland, they have not bothered to study it as no operator is claiming any subsidy funding support. In the national replies of EU countries to the 1997 Commission questionnaire asking for cost estimates of universal service obligations, only four of 15 countries supplied estimates. The highest figures were 5.5% of turnover for Spain and the Netherlands. And these are estimates that have not been independently examined. The experience has been that once PTO estimates are subjected to independent scrutiny, they are reduced to a fraction of the initial claim.

It is then important to assess the extra cost associated with universal service provision with the benefits realized by being the traditional PTO monopoly carrier, with connections to almost every customer and the significant economies of scale and scope associated with operating a national network. There is no doubt that these benefits vastly outweigh a few percentage points of additional cost in comparison to competitors. Moreover, as all competitors who wish to provide public services will require interconnection with the PTO, if

the PTO costs are the basis of the interconnection charges, as is the plan in virtually all countries, then competitors will be contributing to coverage of the PTO universal service costs. Elaborate mechanisms for calculating and sharing these costs are primarily to blunt the face of serious competition, not provide universal service. Those countries that are serious about universal service have gone about it in the simplest way possible.

It is also important to recognize that even the estimates calculated for universal service costs fail to recognize the fundamental characteristics of the economics of telecom networks. In fact, almost all network costs are common costs, shared across all users and services. Except in very extreme and unusual - and therefore insignificant in the total - circumstances, the debate about universal service subsidies is about the allocation of the common network costs. If the extra universal service costs are defined as only the net cost savings to the PTO if a rural community or farm were not served, or were cut off from the network, then the costs would be reduced further.

It is typically forgotten that if someone is not served, the revenue lost is not just associated with calls from that location, but also calls to that location. In addition, worldwide experience has shown that for unserved areas revenue estimates of traffic typically underestimate by several times the actual traffic that develops. And with respect to cost, the unit cost of network extensions is reduced significantly by the multiplier effect of expanding calling opportunities. If network penetration is 80%, then 80% of potential users can call each other. For the remaining 20% of potential users, they can't call one another, or send or receive calls from the 80% who are connected. Thus only 64% (80% calling only 80%) of the potential calling opportunities can be actually provided.

If the penetration rate is increased to 90%, a 10% expansion of the network will raise the calling opportunities actually provided to 81 % (90% calling 90%), an increase of 17%. Thus an increase of 10% in universal service penetration yields an increase of 17% in calling opportunities. If the network is expanded another 10% to 100%, the calling opportunities actually provided will increase by another 19%. Thus, the actual costs of network extension toward universal service can be almost twice as high as the average network cost without increasing the average cost per calling opportunity created by the network expansion. When the economics of network expansion are considered, it confirms that the universal service cost subsidy issue is a red herring. It is created for other purposes.

New Conceptions of Universal Service

Concepts of universal service have changed as the telecom network has developed and become increasingly integrated into the economic, social, political and cultural life of people in different countries and regions. The earliest conception of universal service was simply access to a telephone for emergencies, a concept that still applies in most developing countries today. As the telephone became more pervasive, universal service was conceived as a connection in every residence, initially a party line shared with others and later a private connection. In more recent times, with increased household penetration of computers, concerns about a digital line to permit computer networking are being voiced. Following the EC 1992 Review of the telecom sector, the Commission established the scope of universal service as basic voice telephony plus network access supporting voice,

Group III fax and low speed data access³.

This will provide access to the internet for those with a PC and a modem. The terminals necessary to make use of these services are not part of the universal service. Thus, the cost barrier confronting poor people's ability to obtain these services is increased significantly. In reality then, this is a two tier universal service standard telephone service for the poor and internet access for the middle class. But it attempts to keep the door open for the poor to grow into a situation where digital access to the network is possible. However, since all services are being digitalized on the evolving integrated services digital network (ISDN), one might ask whether this is necessary. Is this perhaps creating a universal service issue where there isn't one, and where market circumstances will have service suppliers competing vigorously for the business.

In implementing the USA Telecommunications Act of 1996, the FCC has adopted a different approach to achieving universal service in an information society. Since universal telephone service in the USA is considered to have been achieved and a number of subsidy funding mechanisms are established, the new policy has focused on the deployment of advanced services to rural schools, hospitals, and libraries. A universal service fund has been established for the expenditure of \$2.25 billion annually for a four year period. All telecom operators must contribute on a proportional basis. Operators providing rural service on a discounted basis may claim reimbursement from the fund. Institutions requesting funds must employ competitive bidding and use price as the primary criteria in selecting a telecom service provider. Funding does not include acquisition of the technical expertise that may be required for potential applicants to assess their needs or prepare appropriate applications for the universal service funds.

Like the EU approach to universal service, the USA approach is directed toward ensuring the network capacity is in place for advanced information services, not the technical or economic capability of the institutions or individuals to take advantage of this capacity or these advanced services. Thus they reflect more quasi regional economic development initiatives than universal telecom service implementation.

As regional economic development initiatives, both the EU and USA approaches are narrowly conceived and unlikely to do much for actual development. Being connected to advanced telecom transmission capacity for services one has neither the income to buy, nor the need or associated equipment or skill to use, will not make advanced information services more universal. The effectiveness of universal service policies must surely be judged by the services that are used, not by those that theoretically could be supplied over the capacity made available.

Conclusion

The concept of universal service is now in transition from an orientation centring on personal communication to one centring on access to information. It is clear that in an information society, it will be increasingly essential for residents to have electronic access to a wide variety of communication and information services, if they are to participate as consumers, workers and citizens. The divide between information rich and poor, which is already growing at an alarming rate in most countries, will not be determined by the

technical capacity of the network, but the capabilities of the people to participate. Advanced telecom services must be a part of programs seeking to develop universal participation in the information society. But these programs must be driven by creating the capabilities and needs to communicate, ie., the demand, and not simply the supply of advanced network capacity. And if these programs are to succeed, they will need to reflect the lessons learned from the actual development of universal service in telephony ie., a direct involvement of the communities and the people affected. That is the challenge of universal participation in an information society that remains to be tackled.

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