

The Information Environment and Universal Service

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This essay focuses on universal service and the Internet as means to support social and political participation. The emphasis on access to telecommunications systems in conventional approaches to universal service is contrasted with access to content. A model of the information environment is described that accounts for the roles of content and conduit, both of which are necessary conditions to achieve true access. A method is outlined for employing information indicators to observe or measure the information environment.

Keywords access, cultural indicators, information environment, information indicators, Internet, new media, social indicators, universal service

Any attempt to reconsider or reframe universal service, especially in the United States, must deal with the enormity of the issue, "one of the great and worthy pillars of telecommunications policy" (Blackman, 1995). It is built on an elaborate body of historical, technical, regulatory, and economic theory and practice. In this brief essay on universal service and the Internet, I focus more narrowly on universal service as a means of supporting social and political participation.

BACKGROUND: CONDUIT VERSUS CONTENT

Universal service carries a good deal of telephone-related conceptual "baggage" that needs unpacking if it is to be a useful principle for the Internet. We need to keep in mind that universal service was directed toward the diffusion of

a single technological system and its services rather than to fulfill telephone customers' needs for information or communication: The emphasis was on the conduit rather than the content.

One problem in scaling-up universal service from telephony to the Internet is that the general public has increasingly confused the access to channels associated with universal service with access to content. Access to channels is of course a necessary condition for social/political participation when most communication media in society are delivery, or conduit-type, channels like the mass media, transmitting content from a few senders to many receivers (i.e., an informing information environment; cf. Lievrouw, 1994). However, developed societies today depend more on conversational, real-time communication and on media that support interactivity and communicators' ability to create, seek, or share content among themselves (i.e., the involving information environment; cf. Lievrouw, 1994).

In this environment, the Internet is the new model medium; delivery-type channels are necessary but no longer sufficient to ensure social/political participation. Discourse, in the sense of individuals actively engaging with each other and their social/political institutions, is the participatory ideal today, and both access to channels and access to content are considered essential prerequisites for social and political participation in advanced societies (e.g., Albery, 1995; Blackman, 1995; OECD, 1976, 1992; Schement, 1995).

To scale-up access and universal service from telephony to new media, then, we must think about universal service in an entirely new way. The Internet in particular embodies both conduit and content issues. Regulators and information industry policymakers have tended to avoid content in universal service considerations; nonetheless, universal service in the involving information environment will be an empty notion if basic information needs cannot be satisfied through the new open channels. We should move beyond the current conduit-centered notion of access in universal service to a more participatory notion of

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discourse, which assumes that some content is essential for social participation.

MODELING THE INFORMATION ENVIRONMENT: CONDUIT AND CONTENT

How do we reorient universal service to fit the new social and technical realities? I propose that the analytic focus should be expanded beyond particular systems and services to consider the information environments of communities and the communication situations of the people who live and interact in them. Fair and appropriate universal service policies today can be formulated only within an environmental, community-based context. Likewise, access should be redefined as a feature of the environment, not of systems. Only by describing and theorizing the information environment and communicators' situations can reasonable decisions be made about

which systems and services are essential in which contexts.

We can start with a hypothetical model of a community information environment (Figure 1). At the most general level, the model comprises both institutional (large circle) and personal (shaded area) domains. In the institutional domain, information (content)-producing institutions such as business, government, and cultural institutions provide a general context of availabilities of information for the community.¹ The information they produce is filtered, shaped, and circulated by media organizations. Institutional availability ($AVAILABILITY_i$) is the presence and circulation of institutionally produced and mediated information in a given community. Availability_i becomes availability_p (personal availability) when individuals become aware of types and channels of information that may be useful or interesting to them personally. People in a community, then, distinguish between the presence of information in

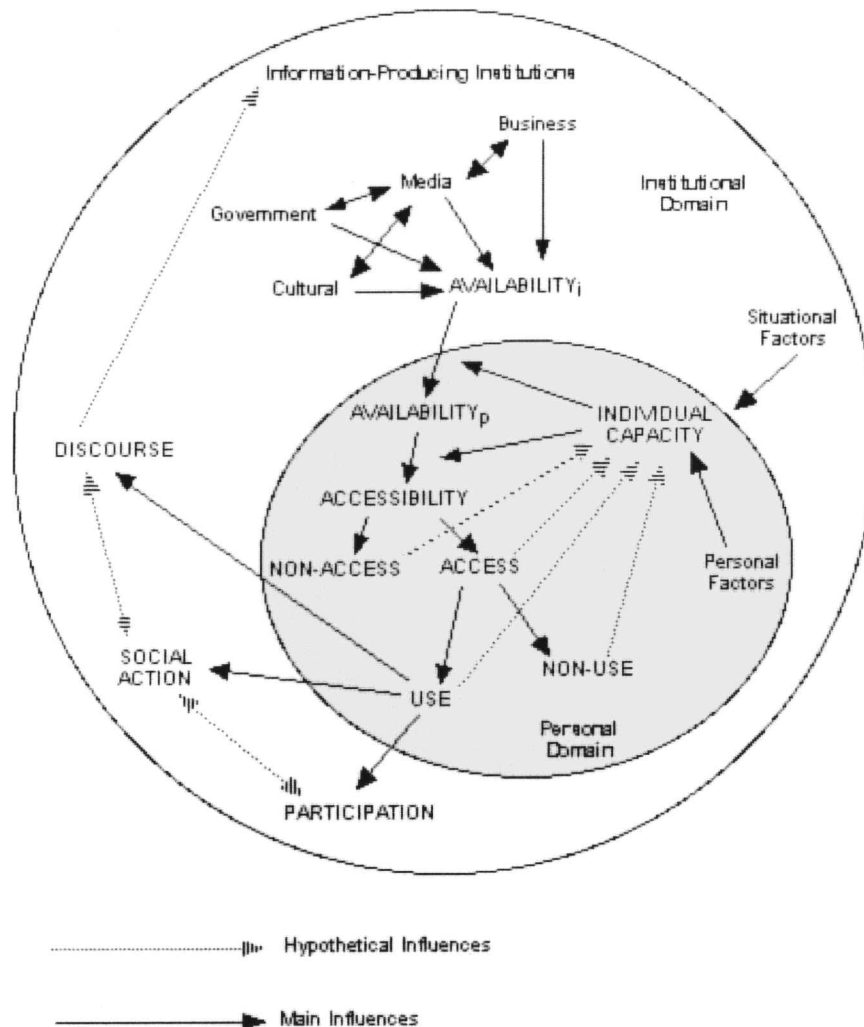


FIG. 1. Model of the information environment.

the environment (availability_i) and its relevance to them as individuals (availability_p).

In the personal domain, people are variously able to convert availability_p into accessibility (i.e., information that they can actually obtain and use for their own purposes) through their individual capacity. Individual capacity is influenced by personal factors, such as literacy, innovativeness, and social intelligence (Cronin & Davenport, 1993) and by situational factors like geographic location, local culture, social network membership, time, economic and technical means, and so on. Accessibility is a prerequisite for access, which is achieved through individual efforts and action; subsequently, the individual may or may not use the information he or she obtains. Discourse and other forms of social action and participation grow from people's efforts to seek and share information, to convert availability_i into availability_p and then into accessibility, real access, and use. The model can be further elaborated (shaded arrows in the figure). For example, use and nonuse may feed back to influence the individual's capacity to seek and share information. Access may influence the individual's perception of availability_p. Social action and discourse can influence the types of information that institutions generate and distribute and the technologies they use.

What does this type of model suggest about universal service? First, it shows that current universal service policy in the United States deals with the availability of telephone services prior to (and more or less independent of) access and use. In the model, availability is an institutional phenomenon, while access depends on people's individual capacities to convert availability into accessibility. While cross-subsidized telephone rate structures and lifeline policies that influence availability also ameliorate some economic (i.e., situational) aspects of individual capacity, they affect mainly system availability, not true access.

Second, the model suggests that if access is the real objective of universal service policies, the availability of channels alone (part of availability_i) is insufficient to achieve it. Access can be ensured only if members of a community have also developed sufficient individual capacity to convert availability to accessibility, and subsequently to obtain access. Universal service may necessarily involve the cultivation of individual capacity as well as institutional sources of information and system development.

MEASURING THE INFORMATION ENVIRONMENT

How do we observe the information environment and the social conditions that affect it? The model also suggests the need for new measures or indicators of universal service and other environmental conditions that are more sophisticated than those used now, such as percentages of households with dial tone (Albery, 1995; Hudson, 1994).

Models may be found in the extensive literature on social indicators that have been devised to overcome the shortcomings of conventional gross domestic product (GDP)-oriented macroeconomic measures of social participation, progress, and development. A social indicator is "a direct and valid statistical measure which monitors levels and changes over time in a fundamental social concern" (OECD, 1976, p. 25). Measures of social conditions such as quality of life or social participation indexes have been formulated that provide a richer and more level standard of comparison across societies than do conventional economic measures alone. Most measures used in social indicators research are objective (e.g., household income or educational attainment), though more subjective attitudinal measures have also been used (Andrews & Withey, 1976; Carley, 1981, 1983; OECD, 1972, 1976, 1982; Sheldon & Moore, 1968; Strumpel, 1974).

The social indicators movement originated in the 1960s; for political reasons its popularity declined in U.S. policy circles during the 1980s.² However, the Organization for Economic Cooperation and Development (OECD), the United Nations Development Programme, the European Community, and other international agencies continue to be innovators in this area and have suggested ways to extend the assessment of social development beyond the usual economic measures (Henderson, 1994).

Following the lead of the social indicators tradition, preliminary information indicators have been developed to assess and compare the features of information environments, notably by Michel Menou and his colleagues for UNESCO. Menou (1985, p. 169) defines information indicators as "quantitative and qualitative measure[s] of information activities at the subnational, national, and international levels," which are used "for the monitoring and appraisal of a nation's conditions related to information activities" (Borko & Menou, 1982, p. 1). Information indicators have been used to chart the growth of scientific and technical knowledge, such as the *Science Indicators* volumes produced biannually by the National Science Board and the National Science Foundation (modeled after the *Social Indicators* series produced by the U.S. Office of Management and Budget; Miller, 1983).

Regarding content, information indicators might also draw from the indicator-type measures of media content developed by George Gerbner and his associates in their study of how media "cultivate consciousness" (Gerbner, 1969, 1973; Gerbner et al., 1986). Cultural indicators are "general and comparative indicators of the prevailing climate of the man-made symbolic environment," especially the nature and rate of change of "transformation of the common symbolic environment" (Gerbner, 1969, p. 138). They are designed to evaluate what the content is, which parts of it are important, which parts are "right," and which parts are related to which others.

Generally, all types of indicators focus on the organizational, institutional, or social levels of analysis, not individual-level phenomena.³ Nonetheless, certain existing indicators may be combined with new measures to provide insights about both social-level aggregate data and the information-related behavior of individuals. Elsewhere (Lievrouw, 1992), I have suggested the following criteria for developing useful information indicators:

- They should be convergent—that is, the individual measurements are diverse but can be triangulated.
- They should be linguistic, focusing on key terms in local language that “light up a whole way of looking at the world” (Geertz, 1983).
- They should be longitudinal, looking at events over time.
- They should be both objective and subjective, accounting for both society-wide phenomena and individual perceptions.
- They should be synecdochal—a few measures stand for many complex phenomena.
- They should focus on the content of information—what’s important, what’s “right,” and what is related to what else.

To return to the model described earlier, any meaningful set of community-based information indicators that might inform universal service and access policies should, at a minimum, include the following types of institutional, individual capacity, and access/use measures of the environment⁴:

Institutional measures:

- Local cable channel capacity
- Educational expenditure per pupil
- Number of seats in fixed commercial cinemas/theaters per 1000 population
- Hours per week of reference desk service at local libraries
- Average faculty salaries at public educational institutions
- Annual expenditures of major arts organizations
- Number of archive, library, information, and data services workers per 10,000 population
- Newspaper circulation per 1000 population
- Number of hours of radio broadcasting per week
- Number of historical societies
- Number of information and referral service agencies

Individual capacity:

- Percentage of population participating in adult education per year
- Ethnic or linguistic diversity/homogeneity
- Average hours of leisure time per worker per week
- Average household size

- Percentage of employees with atypical work schedules
- Persons aged 65 years and over as percent of the total population
- Persons under age 15 years as percent of the total population
- Percentage of population with graduate degrees or postsecondary training
- Political and religious affiliation of residents
- Degree of reliance on social support networks
- Paid annual leave per employee
- Literacy rate of residents

Access/use:

- Number of TV households subscribing to cable systems
- Circulation of general interest periodicals
- Percent of streets and highways meeting minimum maintenance standards
- Attendance in adult literacy classes
- Female participation in labor force
- Domestic and international postal mail/overnight delivery traffic per capita
- Domestic and international fax/telex/telephone traffic per 1000 population
- Enrollment in community, technical, junior, and senior colleges
- Library visits and circulation
- Movie attendance
- Percentage of registered voters

These are just a few potentially useful measures. But a comprehensive framework of information indicators might reveal important and surprising differences from place to place and over time.

To summarize, this brief discussion has several implications for universal service policies for the Internet. First, if universal service is a feature of the information environment, policymakers must deal with both conduit and content issues. In the Internet-type involving environment, the historical distinction between service and content providers is rapidly eroding, and policy must come to terms with this phenomenon. Second, individual capacity as well as system availability are necessary prerequisites to true access, use, and social/political participation. This suggests that universal service must have a training and education component to cultivate individual capacity as well as a provision for infrastructural development. Third, increased discourse and participation will mean greater involvement of community members with their social and political institutions; universal service might be evaluated in terms of whether and how well it promotes this involvement and lowers the current barriers among citizens, media and government.

In sum, an environmental modeling approach, based on sophisticated empirical measurement and evaluation, might help to redirect our current thinking about universal service away from its narrow historical roots to a new and richer contextual approach.

NOTES

1. This model is also influenced by the “context of availabilities” of information developed by Hartmut Mokros; see Mokros and Ruben (1991) and Mokros and Lievrouw (1991).

2. For an insightful summary of the history and accomplishments of the social indicators movement, see Innes (1990), especially her “Introduction to the Transaction Edition.”

3. Individual information-seeking behavior is the subject of an extensive literature in the field of library and information studies that might also be useful in this context. For overviews of this literature, see Faibisoff and Ely (1976), Katzer (1987), Hewins (1990), and Saracevic (1991).

4. Sources include state, county, and city data, publishing and broadcast media directories, OECD and UNESCO lists, Universal Postal Union, World Bank, Federal Communications Commission, Nielson and Arbitron, and U.S. Census data, among others.

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