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Measures of Participation in the Digital Technostructure: Internet Access

David C. Neice

Science Policy Research Unit
Mantell Building
University of Sussex
Falmer, Brighton
BN1 9RF, UK

Tel: +44 (0) 1273 686758
Fax: +44 (0) 1273 685865
Email:
M.E.Winder@sussex.ac.uk
http://www.sussex.ac.uk/spru/

Measures of Participation in the Digital Techno-structure: Internet Access

by David C Neice
Information, Networks & Knowledge (INK)
Science Policy Research Unit (SPRU)
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This paper offers a conceptual alternative to current survey measures of digital participation. Current measures (whether for home or work) dwell on physical access and the mere presence of digital appliances in people's lives. Almost nothing is known about variations in skills and use. Four explanatory models describing the uptake and use of digital technologies are examined; an economic or cost/utility approach; a psychological attitudes approach; a sub-cultural participation approach; and a socio-institutional support approach. A set of specific survey indicators that focus on Internet access are developed to show how more fully articulated measures might be derived and to help move debates about measuring access beyond mere physical proximity to devices. The new measures specify a series of *types and forms and levels* of access to the Internet. The paper closes with a proposal for ways to further refine the measures and an appeal for their subsequent testing.

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http://www.databank.it/dbc/fair/WPSERIES.htm

Contents

1. Purpose and Overview*

The purpose of this working paper is to provide a measurement framework and a set of preliminary survey indicators for examining *types, forms* and *levels of access* to the digital techno-structure. The term 'digital techno-structure' is used to refer to digital networks (the pipes and wires), interconnected computers, software, and modems and protocols, as well as on-line resources and services. The digital techno-structure includes the Internet, but it is broader in scope. It includes corporate, proprietary and special purpose networks and resources such as transactional banking networks.

Points of contact between people and the digital techno-structure are diverse. They cut across socio-institutional contexts such as the home, workplace, school and commerce or community life. The range of technologies available for establishing these points of contact is growing daily. It is known that as people travel across institutional contexts their points of contact with digital technologies change. For instance, some people may use a digital pager on the way to work, a networked micro-computer at work, at school or at home, an Automated Teller Machine (ATM) at the lunch break, a debit card or e-cash while shopping, and check their electronic mail at home or from elsewhere. They may use a library database in the evening or take a class at night that is technology intensive. Thus the types, forms and levels of access people have to digital tools and resources vary considerably. Each point of access involves and represents a specific form of technical and institutional intermediation.

Internet access, in and of itself, has a range of forms of intermediation. For example, with respect to institutional intermediation, there are distinct differences between Internet use in the home and in the context of corporate supported and approved Internet use at work or at school. With respect to technical intermediation, the Internet involves several different levels of skills in computer mediated communication (CMC) and this may create a sense of skill distinction between users.

It is not practical to develop indicators that can be used to measure all the diverse forms of technical and institutional intermediation for the whole array of currently available digital technologies. For practical purposes, the Internet is treated here as a proxy to illustrate certain aspects of intermediation processes that are likely to be associated with the wider class of digital technologies. The Internet offers a particularly useful example because it involves several different types of access intermediation.

The empirical measures that currently exist on access to digital technologies and the Internet are rather basic.[i] They have been developed mainly for market research, advocacy or public policy purposes. This working paper proposes a much more nuanced approach to the analysis of intermediation. The intention is to identify variations in *specific technical* and *institutional forms* of Internet access. The approach is intended to yield measures that move beyond the superficial indicators of contact and use that are available at present.

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The different *types, forms* and *levels of access* to the Internet are the main focus for indicator development in this working paper. A conceptual framework is proposed which provides a basis for operational links to preliminary suggestions for new survey indicators. By focusing on Internet access and its specific forms of technical and institutional intermediation, the methodology is expected to provide a basis for the analysis of other instances where people interact with digital technologies.

2. The Digital Citizen

Expectations About Digital Participation

There is a widely held belief that the uptake of digital technologies eventually will assume the shape and penetration pattern of other electronic technologies that have become 'ubiquitous' (Industry Canada, 1997). Commentators often point to the telephone or the television as examples of technologies with near universal penetration. While it is known that there are important gaps in peoples' contact with and use of digital devices, it is thought that these gaps can be overcome by giving more emphasis to getting people plugged in and 'wired' (DTI, 1997).[ii]

A careful reading of the available evidence on the uptake of digital technologies does not necessarily support the belief that digital ubiquity and 'mass' use of digital technologies are certain outcomes (Neice, 1996). In fact, while still requiring further interrogation, the evidence hints that digital technologies may not become 'mass commodities' at all. Their use may be wedded to specific social characteristics and to the aspirations of those that either hold, or seek to acquire, these characteristics.

What is Known

It is only in the past few years that data have appeared on people's actual use and interaction with digital technologies and their attitudes towards them (Compas, 1997 and DTI, 1996 and 1998 and Bernard et al., 1997).[iii] There are two notable trends in the existing evidence; one is attitudinal and the other is behavioural.

First, the attitudes of those who have been studied appear to be divided between the 'technophiles' and the 'technophobes', i.e. the enthusiasts and the unimpressed or even alienated. These attitudes tend to split along the lines of age (with upscale youth being more enthusiastic) and gender (with males being more optimistic). The most important fault line seems to be associated with the amount of direct hands-on experience with new digital technologies that survey respondents have had. Those *without* significant contact experience seem lost and often fearful of the (possibly projected) powers of new digital technologies.

Second, behaviour which is usually indexed using simple survey measures such as ownership and use of micro-computers, modems and associated digital peripherals, and crude measures of access to the Internet and other on-line services, shows reasonably clear patterns marking high levels of interaction with digital technologies. The main users, and certainly the bulk of early adopters and those who strive to keep up with new developments, are mostly young, urban, technically competent males, with high education levels and considerably above average incomes.

These recurrent patterns suggest that 'participation' in the digital techno-structure may have taken on a particular shape or morphology. This may involve segregation and segmentation into categories of the 'included' and the 'excluded'. However, and this is of singular importance, the survey measures upon which the currently available findings are based are superficial. The purpose of the approach outlined in this working paper is to propose a richer framework for future investigation and understanding.

The *Wired* Survey Results

Further evidence has recently emerged on the links between digital participation and the citizen. The widely read *Wired* magazine has published the results of a survey carried out in the US which investigated the political attitudes and beliefs of those 'most connected' to the digital techno-structure (*Wired*, 1997). The results of this survey confirm the social participation patterns discussed above and they provide information about political attitudes.[iv] The *Wired* survey suggests that those who are the 'most digital' are not at all alienated from the economic or political system as suggested by current media stereotypes. Rather they seem to have very high levels of civic and political involvement and see themselves as part of an emerging 'digital nation', which is seeking solutions for societal problems through applications of new technologies.

The *Wired* study concluded that political parties will have to pay increasing attention to the aspirations of this segment of the population. Through their influence over others, digital citizens will increasingly define the future political agenda. Thus the social segmentation of the population into the 'connected' and the 'unconnected' may also have implications for established political cultures thereby potentially increasing pressure on states to reduce barriers to social exclusion.

Social Exclusion and Barriers to Participation

Haddon draws particular attention to the processes of social exclusion in a telematics society (Haddon, 1998). Haddon cites Claisse (1997) approvingly who rejects a simple dichotomy based on technology 'haves' and 'have-nots' as being too simplistic. He opts for a more complex reading where exclusion is built up from levels of access to various types of equipment and services. Using telephony as an historical example, Haddon points to research in Germany on the unemployed where the presence of a telephone in the life of unemployed persons is a vital link to their social networks and to their demonstrated capacity to recover and reorient their lives (Haddon, 1998:9). If this analysis is extended further into the future, it might be inferred that as digital devices come to be increasingly relied upon and embedded within daily activities and expectations, any severance of these vital links (such as e-mail) may come to be regarded as being as serious as the loss of telephone communication is today.

Haddon argues that there are three essential bases for social exclusion from a society pervaded by ICTs: a) exclusion by virtue of available resources, i.e. whether households, institutions or community facilities make actual physical connectivity possible; b) exclusion by virtue of competencies, i.e. whether people have the technical and intellectual skills to use and take advantage of physical connectivity; and c) exclusion by virtue of cultural values, i.e. some segments of the population may actually prefer to avoid connectivity such as the elderly, or some working class males.

Current Policy Response

The current policy bias is tilted towards 'consumer engagement' models rather than models of relative deprivation. Policy activity tends to promote the idea that building a knowledge-based society means fuelling economic growth and consumption. The emphasis tends to fall upon ways of achieving equality of *consumer access*. However, the important long-term issue may not be about consumerism as such, but rather about *citizenship access* and the kinds of skills and open access that participatory citizenship implies (Neice, 1997).

Citizenship since Marshall

Commitments by the state to the principle of universal access for citizens to specific skills, benefits and services have a long tradition in the advanced societies. These are often tethered together under the general concept of citizenship. T.H. Marshall identified citizenship as a highly progressive lateral levelling force, asserted through a common legal status under the state, that is 'dynamically juxtaposed' with the privileges associated with social class (Marshall, 1973). The benefits of citizenship vary substantially from society to society, but frequently they include broad availability of benefits (and services) in areas such as education, health care, (un)employment insurance, seniors' allowances, national pension plans, and welfare provisions for the needy.[v]
If citizenship is to remain a vital and progressive force it must eventually 'roll over' into the digital domain (Karim, 1997). From a policy perspective, the exclusionary patterns that are being identified in connection with the digital techno-structure lead to a policy hypothesis. Access to digital technologies and resources may come to be regarded as a fundamental requirement for inclusion and participation in a knowledge based economy and society. The barriers to participation and the bases for social exclusion noted above are likely to become central to emerging ICT access debates in different societies. When this occurs it will be important to understand the underlying dynamics that produce patterns of digital participation and the social forces of inclusion and exclusion more thoroughly.

Needed: A Framework for Explanation

A systematic understanding of the dynamics of digital participation is not presently available. This is due to the immaturity of research on access questions and to the inadequacy of frameworks for measuring these dynamics. Statistics on the most basic aspects of Internet access are inconsistent in their use of core questions resulting in conflicts over interpretation of survey results and they suffer from the lack of the development of a rigorous analytical framework prior to the creation of the survey questions that are commonly used (Neice, 1996). In addition, as yet there are no standards or benchmark measures for international comparisons of emergent forms of intermediation with the digital techno-structure. The international comparisons of Internet access that do exist are based on different sources of data which rely upon different survey formats and the original intention of these analyses has not been to design surveys specifically for international comparative purposes.

To redress these problems, three steps are needed. First, there is a need for a set of alternate explanations for the patterns of participation that have been observed. Second, a measurement framework is needed that can support further operationalisation of concepts through indicator and survey question development. Third, a set of provisional survey questions is needed that can provide initial indicators of the types, forms and levels of access and participation in the Internet

environment. Ideally, any new framework and proposed measures should have the potential to support international comparative research. The framework proposed in this working paper delves into the forms of technical and institutional intermediation that may be shaping existing patterns of digital participation.

3. Four Explanations for Digital Participation

At the outset, the process of framework and indicator development should begin with the identification of explanations for existing evidence of strong positive correlation's between certain user characteristics (i.e. young males, with high education and above average income) and the use and uptake of digital technologies, apparently regardless of which society is surveyed. There are at least four possible explanations: an economic cost/utility approach; a psychological or attitudinal characteristics approach; a sub-cultural approach; and a socio-institutional explanation. Each of these has implications for the types of data that are being collected. Existing measures and indicators are dominated by the economic and attitudinal approaches, thus missing out on the powerful insights that could be generated by looking at the *sub-cultural* and *institutional contexts* through which technical intermediation is effected.

a) An Economic or Cost/Utility Approach

An economic approach implies that the cost of owning digital appliances, such as micro-computers, as well as public perceptions of their limited utility, are potential barriers to the acquisition of these appliances and that they close off wider participation (Garnham, 1996). Coupled with this is the consumer oriented perception of rapid depreciation for digital devices and their short shelf-life due to accelerated product innovation schedules. It could be argued, therefore, that only the economically advantaged 'go digital' and 'get wired'.

While this argument is superficially attractive, it does not bear scrutiny. Cheap micro-computers have been available for some time and they have been accorded only lack-lustre interest. A huge secondary market in (slightly) used micro-computers is possible, but apart from gifts to schools it is not flourishing in the industrialised countries. Compared with the costs of other big ticket items such as televisions or cars relative to income in the early years of their adoption, digital devices are not very expensive. Nor are they particularly costly when they are compared to other contemporary life-style items like music and hi-fidelity equipment or even mountain bicycles. Finally, important niches and segments of the population with considerable 'cultural capital' but with relatively low incomes, such as post-secondary students, are often the most 'wired' segment within the overall youth population.

b) A Psychological Attitudes Approach

Another approach involves psychological or attitudinal factors. This approach divides the world into attitudinal constituencies such as the 'technophiles' and the 'technophobes'. Sometimes clusters of attitudes are used to point to psychographic segments of the population such as 'the enthusiasts' and 'the alienated' (DTI, 1996). Some argue that fear of technology is the root problem underscoring technophobia and alienation. Digital devices are purported to make people feel inadequate and challenge their sense of mastery. Even more 'frightening' is the idea that digital technologies may project inherent powers (such as control and surveillance), thus putting some people off their use and generating avoidance patterns (Lyon, 1994). From this perspective, it might be presumed that well educated and more affluent young males are better able to overcome insecurities and to wrestle with the digital demons.

While the psychological or attitudinal arguments have some attractions, what is missing is the important role of sub-cultures and specific contexts of use in which experience is developed. For example, Internet technology is widely subscribed to by young males. Does this mean that young females are frightened by it? This seems doubtful given the large numbers of young females who are proficient in the use of micro-computers and all types of applications software and assorted peripherals at their places of work. In what possible way is Internet access different from, or more complicated than, gaining access to central databases in most large organisations? Access to corporate data is a task carried out effectively by many young female clerical workers across a wide range of corporate settings.

Similarly, it cannot simply be attitudes arising from low income or modest education *per se* that reduce participation in, and use of, the digital techno-structure. The clerical work force, which neatly fits this description, is often comprised of highly skilled workers with digital tools when the institutional context surrounding their use actively supports this. Psychological dispositions can be influenced profoundly by the specific institutional contexts of experience, use, expectations and support, and there is a need to deepen this perspective if we are to understand the dynamics of participation in the digital environment.

c) A Sub-cultural Approach

The third explanation is based upon a sub-cultural model. The use of digital technologies usually requires certain specialised skills in computer mediated communication (CMC). From the perspective of this model, the mastery of CMC will appeal only to some people and membership in this sub-culture or 'tribe' requires both specific demonstrable skills and the possession and use of specific artefacts (Woolgar, 1996). The deployment of these skills and artefacts is an important badge of sub-culture membership and identification.

CMC and the sub-culture of the Internet create linguistic codes; a system of terms, acronyms, descriptors and labels that must be learned, and this requires considerable investment of time, more than a little effort, and some aptitude. This model suggests that there is a 'frontier' character to CMC and digital activities and, like other frontiers, it involves risk, unpredictability and adventure. The sub-cultural approach implies that only some people are likely to be attracted to this sub-culture such as young males with a considerable amount of 'cultural capital' and the income to support adventurous consumption.

d) A Socio-institutional Approach

The fourth and final approach is socio-institutional. Under this explanation only some institutional contexts are considered to be technology 'enriched' while others are considered to be technology 'lean'. Only some institutional contexts offer enhanced support where the standard expectation is that people 'will be digital'. These enriched and supportive contexts contrast with places where such expectations are less prevalent. Some status group affiliations *demand* digital participation such as the skill and status expectations expected of post-secondary students (regardless of their income). Similar expectations exist for people in information technology-related careers and for people in 'information and clerical work'.

This model suggests that it is the contact with, and use of, the digital techno-structure that is mediated by institutional resources and social expectations. In a very real sense, digital participation may be facilitated by both a field of social and institutional forces and by the physical resources that large institutions offer their members. The strong associations between digital access and status characteristics are therefore not to be understood merely by reference to individual status

characteristics (like high personal income). Rather, they may be explained by the fact that most high income earners enjoy particular kinds of privileged and enriched institutional affiliations.

‘Domestication’ and its Extensions

Roger Silverstone has drawn attention to the way technologies are ‘tamed’ through processes of ‘domestication’ (Silverstone, 1996). He uses the term domestication with particular reference to household life and to finding a place for digital technology in family routines. Silverstone notes the domestic conflicts that arise over the location of a new piece of technology, the ownership of it (symbolic or otherwise), and the control of it. Threats and anxieties can be released as familiar routines, rituals and behaviours are replaced by new patterns and attractions.

What is striking about the domestication process described by Silverstone is its applicability to many institutional environments. For example, ‘a place’ has to be defined for new technologies in every institution whether it is a family or a huge bureaucracy. People must adapt to new routines and expectations. Anxieties are released about how the use or display of a digital technology relates to ‘positions’ in an organisational hierarchy. Social comparisons are drawn, for better or worse. The processes of taming and domestication that Silverstone suggests are being played out in households are likely part of a broader class of placements and accommodations between people and technology. They are, in fact, situational variations on ‘the proper placement of technology’, whether it is in a family’s household or in a government office.

This demonstrates that different institutional contexts can set up quite different definitions of the situation regarding the place of technology. This may in turn produce a range of sub-cultural status markers and institutional differentiators that depend on the (variably) supportive features of the contexts where they are found.

Four Policy Implications

Differences in the four explanatory approaches can be further understood by reviewing the answers they suggest to a practical question: how can access to and participation in the digital techno-structure be increased? The economic approach implies that digital technologies and service should be more useful and cheaper. The psychological approach implies the need to further promote technology and assuage the fears of those who are technology avoiders. The sub-cultural approach implies that digital participation could be widened either by penetrating or opening out the sub-culture and by enlarging the tribal membership. The socio-institutional model suggests the need to modify social expectations and create enriched institutional contexts and supportive experiences.

Needed: A New Framework for Measurement

Existing data enable us to present the foregoing alternate explanations, but they do not that allow us to analyse their determinants or consequences in detail. The economic and attitudinal approaches are supported by more developed data resources and are relatively strongly advocated. An inherent bias in most of the data that has been collected on the topic of access to digital technologies is that the studies have been based implicitly or explicitly on the assumptions underlying either the cost/utility

or the attitudinal approaches. The sub-cultural and socio-institutional approaches remain relatively unexplored.

The two new approaches noted above point to the possibility that there may be two quite distinct Internet worlds. One world may be primarily sub-cultural. Here the empirical patterns of young, well educated, high income males, supporting a consumer appetite for acquiring the latest digital devices, which are pursued in domestic privacy, may prevail. The other world is one in which Internet access is institutionally mediated and supported, in which people with access (and purpose) acquire it through the enriched resources of organisations.

The next sections of this working paper outline objectives for the measurement of the sub-cultural and socio-institutional aspects of Internet access, and present the basis for the operationalisation of a new set of indicators.

4. Measurement Objectives

The Independent Variable: Types, Forms and Levels of Internet Access

The main measurement objective is to develop a set of survey based indicators of Internet access that reflect the measurement of the *types*, *forms* and *levels* of Internet access. The idea is to create a relatively sophisticated independent variable through which different sub-dimensions of access variation can be combined or separated out according to user preferences. The specification of new survey research measures on Internet access is expected to contribute to longer term analysis of other features of contact and access with the wider digital techno-structure.

Of prime importance for the framework is the extent to which the types, forms and levels of access to the Internet involve institutionally supportive or enriched contexts. This is a major basis for differentiation in the values of the independent variable and contrasts with simpler indicators of Internet contact experience.

This requires the specification of degrees of 'technical intermediation' and degrees of 'institutional intermediation'.[vi]

'Institutional intermediation' refers to the extent to which Internet access is reinforced for some individuals, groups and social strata by institutionally enriched and supportive contexts. For instance, there is likely to be a difference between people whose prime points of Internet access are basement or hobby based as distinct from those who have access through institutions such as corporate entities or education facilities. Similarly, there is likely to be a difference between those who pay for access directly and those who obtain it as part of a larger package of institutional benefits associated with participation in digitally enriched and supportive contexts.

Similar differences are likely to hold for skills and specialised training which involve levels of 'technical intermediation'. Those who are operating in places where Internet access is an important functional element are likely to benefit from the skills and training which are available and that are in turn reinforced by institutional intermediation. Similarly, the physical qualities of institutional connections, e.g. available bandwidth, speeds of connectivity links, device platforms and upgraded

software, are likely to be superior in contexts where institutional intermediation prevails over the types, forms and levels of Internet access.

A Composite Index

A composite picture or 'empirical index' can be constructed involving types, forms and levels of Internet contact and use, and this index can be used as a basis for establishing the relative degree of contact access and proximity that some individuals, groups, and social strata have to the Internet as compared to others. The independent variable can be quite sophisticated and can be comprised of a combination of types, forms and levels of access resulting in an overall index of Internet access.[vii]

The intention is to build up a set of components or building blocks for a new composite index of Internet access. This can then be applied to discriminate between high, medium and low levels of technical and institutional intermediation through combinations of types, forms and levels of access.

The Dependent Variables

Preliminary descriptive items for the dependent variables are included in the draft questionnaire in Annex 1 in order to illustrate the next steps that are needed to implement the proposed methodology. A central hypothesis underlying this empirical approach is that the types, forms and levels of Internet access will vary consistently with perceptions of the interaction of digital technologies and social status. This hypothesis is based upon the argument that digital technologies are beginning to reshape perceptions of social honour and its allocation and that it is important to analyse the extent to which differential access to digital technologies is associated with changing perceptions of technology related 'social discriminators', and how these new distinctions of difference are being woven into the evolving status order[viii].

Two Working Concepts

Two working concepts that guide the field observation of 'social discriminators' are the dependent variables: *status markers* and *status differentiators*. These terms are employed to capture important elements in the social construction of status orders (Scott, 1996). Status markers refer to specific and observable physical and socially imputed identifiers. These markers usually depend on sub-cultural definitions for their reinforcement. Status differentiators refer to transactional processes that catalyse, embed, and inscribe various status markers as distinctions of 'difference', that is, they institutionalise difference. When differentiators are regularised, they generally crystallise into institutional norms, rules, policies and categories. Both status markers and differentiators involve aspects of more or less continuously negotiated perceptions through which social status and ranking are assembled and reinforced. They occur where people interact and construct meaning.

Status markers are physical features or social distinctions based on sub-cultural and socially defined categories. They can be based on real physical attributes such as when people are perceived as male or female, or they can be socially defined as real, such as when someone (of either gender) is deemed to be either masculine or feminine. Status markers are basic categorical features around which the active construction of social inclusion and exclusion takes place. They mark out a nominal ordering of reality.

Status differentiators are broader processes that are usually institutionally embedded whereby a marker is given wide-spread validation, assent and reinforcement through social reproduction. A radical example of a status differentiator is apartheid. Both status markers and status differentiators 'take difference seriously'. However, differentiators formalise these differences and convert them into grounds for social inclusion and exclusion.. Within the sub-culture of Internet activity, for example, labelling someone as a 'net-head' is a status marker, whereas a job described as a 'network administrator' is a differentiator'.

People in various contexts and settings, are likely to place ICTs somewhere in their evolving cognitive maps. ICTs are likely being valorised and appropriated by particular status groups and social strata who interact intensively with them. A review of research in the community field tradition (Neice, 998) has revealed that qualitative categories for social marking and labelling frequently involves the binary opposition of categories and types.[ix] A hierarchy of physical differentiators, service differentiators, occupational differentiators, skill markers, symbolic markers, and sub-culture markers has been developed in order to allow for operationalisation of the two dependent variables.

5. Measurement Dimensions or Axes

Ten dimensions are identified for the development of new data and survey questions. These dimensions are illustrated in Annex 1 using preliminary questions grouped into sections. The first seven dimensions relate to the types, forms and levels of access. Sections eight and nine are concerned with indicators of sub-cultural markers, and section ten deals with institutional status differentiators. Since the main purpose of this working paper is to concentrate on developing measures of the independent variable, sections eight, nine and ten are developed very schematically, and only a few attributes are included for illustration.

The ordering of the questions in Annex 1 is illustrative and requires further development in order to enhance the quality of the presentation of the survey instrument for the respondents.

a) General Awareness

These preliminary questions seek to sensitise the respondent to the topic and encourage the respondent to settle into an attitudinal perspective. The Internet of course has a range of positive and negative public perceptions. These indicators provide a way of assessing the respondent's basic attraction or antipathy to the Internet.

b) Physical Access

Physical access is the single most important dimension covered by the independent variable index. However, in past studies, questions of this type have not been anchored within specific institutional contexts and settings. A clear delineation is made in the proposed questions between computer access at home, work, and school or in community settings. As well, a clear link is established between Internet access and the possible multiple contexts of use. Close attention is also paid to the quality of available computer resources in each context.

c) Time Use

The time allocated to an activity is the second most important indicator of participation. Included are some simple but straightforward measures of time allocation. A question is included on the

issue of whether computer use and Internet use involves trade-offs against other common life-style activities.

d) Skills

These questions ask about the respondent's personal competencies and confidence in the use of digital technologies. There is of course the possibility of exaggeration by some respondents, but the validity of these questions can checked by relating them to other questions on Internet services. Only frequent Internet users are likely to use advanced services such as Internet teleconferencing.

e) Services Used

Market survey questionnaires on the Internet are often replete with questions about potential forms of Internet commerce. The set of questions on services offered here differs somewhat by focusing on aspects of Internet communication (such as e-mail) and on understanding variations in the use of both elementary, intermediate, and advanced services such as FTP and TELNET. These variations in Internet service use are associated with a behavioural approach to measuring basic and advanced skills.

f) Costs and Subsidies

One the most important findings in previous studies is that considerable Internet access and use takes place within institutions. Some of these are workplaces and others are community facilities, such as schools. Institutional support is a key element in the socio-institutional approach. This section also includes a question that deals with perceived barriers to participation. These questions are included in order to assess the explanatory powers of the cost/utility approach or the psychological barriers approach.

g) Support and Back-up

Formal and informal sources of support are examined in this section. Access to computer and Internet based training is likely to be a major differentiating factor between institutional access and personal, home based, or hobby access.

h) Digital 'Companions'

In order to assess the characteristics of emerging 'wired' sub-cultures, this section includes questions designed to determine how many ICT 'companion technologies' such as cellular phones or digital scanners the respondent has access to or regularly uses. At a behavioural level, questions of this kind can be used to explore differences between new participants and more experienced respondents.

i) Sub-culture Markers

These questions are highly schematic and are only included as pointers to the types of questions needed. The examples supplied explore the semantic sensitivities that respondents might have to particular terms that are used quite widely within the Internet sub-culture. It will be essential to ensure that questions on sub-culture markers are built up from qualitative field research and future intentions in this regard are described below.

j) Institutional Differentiators

A very limited example of status differentiators is included in this final section. As the sample questions indicate, it is expected that these will be primarily institutional differentiators. In a manner similar to the sub-culture markers, extensive qualitative field research will be required before further development of these indicators can effectively proceed.

Types, Forms and Levels of Access

The items that make up sections one though seven of Annex 1 will permit various empirical combinations of items and will yield a discriminating and effective independent variable upon which to offer a characterisation of 'forms' of digital participation. For instance, implementation of a survey questionnaire containing elements such as these will yield data that will make it possible to distinguish between users who are primarily residential users and likely to personally bear the costs of use from those who are embedded in institutional settings and are able to benefit from the support provided by those settings. Similarly, the forms and levels of access can be related to various categories of service use and to skills at CMC. It will also be possible to identify respondents who have either single or multiple points of access and contact. This is an important participation discriminator that is usually lost in the market research studies that place more emphasis on consumer questions.

These empirical distinctions for the independent variable can be based upon sub-parts of the composite indicator or on all seven dimensions. Correlations between the dimensions will provide the basis for the construction of typologies of different forms and levels of access. The typologies that emerge from data analysis and their association with other demographic indicators will provide the eventual basis for robust new indicators once extensive pilot testing is achieved.

6. Pilot Applications

The framework and preliminary indicators that have been outlined in this working paper provide the basis for further development and application of measurement tools for the analysis of Internet participation and use. A qualitative research phase is needed to further refine the survey indicators. Further detailed specification of status markers and differentiators also requires a qualitative research phase to uncover these fundamental perceptual features and build them in to the survey design. A series of focus groups will be organised by pooling people matched by social characteristics (such as Internet intensive workers, or the young upwardly mobile). It is expected that sub-cultural and institutional intermediation is empirically associated with distinctive perceptions of digital technologies found amongst emerging social groups.

A pilot survey, using refined questions within a questionnaire instrument, will then be implemented to generate a first set of empirical data to test the hypothesis outlined in this working paper.

Notes

i Some useful examples are Dickenson and Sciadas (1996), Jeffrey (1995), US Department of Commerce (1995), CommerceNet/Nielson (1995) Department of Trade and Industry (1996 and 1998). Others are available through the European ISPO web site at http://www.ispo.cec.be/

ii In many countries in Europe and North America there is a recognition that access to and participation in the digital techno-structure may become an important policy issue. The European Commission has put 'access' on its list of priorities (Bernard et.al., 1996 and 1997) and in the UK the issue is handled by the Department of Trade and Industry through their 'IT for ALL' programme (DTI, 1996). The US policy work is guided by the development of the National Information Infrastructure Agency (NIIA). In Canada, general issues on Internet access surfaced with surprising force during deliberations of the Information Highway Advisory Council (Industry Canada, 1995 and 1997).

iii While much of the existing evidence is based on the patterns foumd in North America, similar profiles are emerging from European studies (European Commission, 1997 and DTI, 1996 and 1998).

iv The survey found that the 'connected' and the 'superconnected' comprised 8.5% of the US adult population. Distinctions between 'connection' categories relate to the number of digital technologies accessed per week

v A series of mutually interacting forces in recent years have been affecting past achievements concerning both universal access and citizenship. The most pressing of these has been fiscal austerity where virtually every level of government has been forced into a general erosion in the levels of services available, engendering claw-backs in certain benefits and some weakening in the overall value commitment to universality. Second, the forces of economic globalisation and trade liberalisation, through such instruments as NAFTA and the Maastricht Treaty, have introduced policy questions and considerations about the viability of universality and universal provisions for some programmes across signatory states. These forces and other trends have put the advance of citizenship in 'brackets'

vi Institutional mediation is a variation on a particularly useful concept developed by Raymond Breton which he called 'institutional completeness' (Breton, 1964). This concept was developed to account for variations in the relative degree of success during the transition experiences of new immigrants to Canada. Breton indexed the institutional completeness of different immigrant reception communities. This was operationalized through features such as whether these communities offered new immigrants supportive community experiences through things like specialised shops and markets, political associations, clubs, and even community newspapers. Specific immigrant communities could then be categorised as to their levels of 'completeness' and this was found to be highly correlated with the personal satisfaction experienced by immigrants. Those arriving in 'more institutionally complete' communities had much better personal experiences during the displacement and transition stresses of immigration. Our implicit acknowledgement of the explanatory power of the institutional level and also Breton's work is reflected in our attempt to transport parts of his thinking to our current work.

vii Previous work by the author, using empirical trends derived from existing research, sought to locate those people with better access to the digital techno-structure and with appropriate matches in technical training, credentials, occupation, income and personal interests (Neice, 996). These people, considered at the societal level, were termed *the information proximate*. The less attached and the unattached, comprising those who are more likely to be excluded or marginal to digital access were termed *the information periphery*. The basic polar distinctions of *proximate/periphery* were not intended to be mutually exclusive in a methodological sense, but they are sensitive to access disparities and convey the sense of a *participation continuum* with most people (potentially) falling somewhere inside and along the array.

viii For an extensive discussion of this argument see D. Neice, FAIR Working Paper No. 43.

ix The community field study tradition offers concrete examples of how technology intermediates social processes. Community studies can be used to find evidence of actual shifts in social perceptions while they are in progress and being constructed. Our proposed research is similar to work found in the community studies carried out by Lloyd Warner (1949 and 1963) and Robert and Helen Lynd (1929).

ANNEX 1 Illustrative Survey Questions on Access to the Internet

Assumptions

1. These questions are devised to be administered using telephone survey techniques.

2. The final questions will include a series of standard demographic indicators such as gender, age, occupation, income, marital status etc., following standard practice in survey research. These demographic indicators are not included here.

3. The question order will likely change for purposes of smoothing the sequence.

Introduction

"We are doing a survey on behalf of (sponsoring institution or entity) on the topic of computers and Internet use. You have been selected to participate. It will take about 15 minutes of your time and we will ask you about 25 questions. Are you willing to proceed?"

Section I: General Awareness

Q1. [Read] The Internet is a global network of computers and there is a lot of discussion about it.

✎ Have you heard of the Internet? Yes ☐ No ☐ Don't Know ☐

Q2. ✎ Would you say what you have heard is [Read each] Very Positive ☐
Positive ☐
Mixed ☐
Negative ☐
Very Negative ☐
Don't/K ☐

Section 2: Physical Access

Q3a. Do you personally have regular access to and use of a computer in your home?

Yes ☐	No ☐	Don't Know ☐
GO to Q3b	GO to Q4	GO toQ4

Q3b. Does the home computer you use have access to the Internet?

Yes ☐ No ☐ Don't Know ☐

Q3c. Thinking of the home computer you use, would you describe it as...

[Read each] .....the newest and fastest technology? ☐
.....a bit older and slower? ☐
.....very old and quite slow? ☐

Q4a. [*If the respondent is employed*]:

Do you personally have access to and use of a computer where you work?

Yes ☐ No ☐ Don't Know ☐

Q4b. Does the workplace computer you use have access to the Internet?

Yes ☐ No ☐ Don't Know ☐

Q4c. Thinking of the workplace computer you use, would you describe it as...

[Read each] .....the newest and fastest technology? ☐
.....a bit older and slower? ☐
.....very old and quite slow? ☐

Q5a. [*If the respondent is attending a school, college or university*]:

Do you personally have access to and use of a computer at the school you attend?

Yes ☐ No ☐ Don't Know ☐

Q5b. Thinking of the school based computer you use, does it have access to the Internet?

Yes ☐ No ☐ Don't Know ☐

Q5c. Thinking of the school based computer you use, would you describe it as:...

[Read each .....the newest and fastest technology? ☐
.....a bit older and slower? ☐
.....very old and quite slow? ☐

Q6a. Thinking about the community you live in, is there any other place where you have access to and use of a computer? [*Check as many as mentioned*]

None ☐ GO to Q7

Libraries ☐
Community Centre ☐
Voluntary Group ☐
Church ☐
Cafe or Pub ☐
Other ☐

Q6b. [*If any of the above are checked*]:

Does this community based computer have access to the Internet?

Yes ☐ No ☐ Don't Know ☐

Section 3: Time Use

Q7. How many hours a week (on average) would you say that you use a computer?

No computer use	☐
Less than 1 hour	☐
1 to 3 hours	☐
4 to 10 hours	☐
11 to 20 hours	☐
21 to 40 hours	☐
More than 40 hours	☐

Q8. How many hours per week (on average) would you say that you are connected to the Internet?

No Internet use	☐
Less than 1 hour	☐
1 to 5 hours	☐
6 to 10 hours	☐
11 to 20 hours	☐
21 to 40 hours	☐
More than 40 hours	☐

Q9. Does your weekly use of a computer or the Internet affect the time you have:

	Yes	**No**
[Read each] ....for reading newspapers or magazines?	☐	☐
.....for watching television?	☐	☐
.....for reading books?	☐	☐
.....for visiting with friends or neighbours?	☐	☐
.....for family activities?	☐	☐

Section 4: Skills

Q10. How long have you been using a computer? [*Probe for respondent to specify <u>time</u>*]

Less than six months	☐
More than 6 months but less than 1 year	☐
1 to 2 years	☐
3 to 5 years	☐
More than 5 years	☐

Q11. How long have you been using the Internet? [*Respondent to specify time*]

Less than six months	☐
More than 6 months but less than 1 year	☐
1 to 2 years	☐
3 to 5 years	☐
More than 5 years	☐

Q12. How would you describe your skills when working with computers?

Would you say you are.....

[Read each]	.....a new or novice user?	☐
	.....still learning the basics?	☐
	.....an intermediate user?	☐
	.....a technical person with training?	☐
	.....an expert or professional?	☐
	.....Don't Know	☐

Q13. How would you rank your skills and problem solving ability when working with computers?

Would you say you....

[Read each]	.....are highly skilled and quite confident?	☐
	.....have medium skills and modest confidence?	☐
.	.....have weak skills and low confidence?	☐
	.....Don't Know	☐

Section 5: Services

Q14. Which of the following service options provide you with Internet access?

[Read each]	.....a specialised Internet Service Provider?	☐
	.....a large on-line service agency (AOL, CompuServe, Delphi, Genie, MSN etc.)?	☐
	.....an educational institution (secondary school, college or university)?	☐
	.....the organisation of your employer?	☐
	.....a Freenet or Bulletin Board Service?	☐
	.....other on-line services?	☐
	.....Don't Know	☐

Q15a. Many people now have an electronic mail address or e-mail address.

Do you have an e-mail address?

Yes ☐ No ☐ Don't Know ☐

GO to Q15b

Q15b. Is it a home based or a work based address, or do you have both?

Home based ☐ Work based ☐ Both ☐ Don't Know ☐

Q16. I am going to list some activities. Tell me how would you rank the importance of the Internet to you for each activity.

Would you say it is highly important, moderately important, or of low or no importance?

		High	Moderate	Low
[Read each]	....entertainment and games?	☐	☐	☐
	....education and learning?	☐	☐	☐
	....communication with friends?	☐	☐	☐
	....communication at work?	☐	☐	☐
	.....information or document retrieval?	☐	☐	☐
	.....obtaining software?	☐	☐	☐
	.....shopping and purchasing?	☐	☐	☐

Q17. I am going to read a list of activities and services available on the Internet.

Please indicate either a simple yes or no whether you use them.

		Yes	No	Don't Know
[Read each]	.....simple e-mail messaging?	☐	☐	☐
	.....email file attachments?	☐	☐	☐
	.....web browsing?	☐	☐	☐
	.....using search engines (i.e. Yahoo)?	☐	☐	☐
	.....reading news groups (USENET)?	☐	☐	☐
	.....using GOPHERS?	☐	☐	☐
	.....chat rooms and IRC?	☐	☐	☐
	.....moderated discussion groups?☐	☐	☐	
	.....software or file downloading (FTP)?☐	☐	☐	☐
	.....host computing (TELNET)?	☐	☐	☐
	.....Internet radio or phone?	☐	☐	☐
	.....Internet video-conferencing?	☐	☐	☐

Section 6: Costs and Subsidies

Q18a. Who primarily pays for your access to the Internet?

.....yourself or another household member directly?	☐	(GO to Q19)
.....your employer or the institution you work for?	☐	(GO to Q18b)
.....your school or educational institution? ☐	(GO to Q18b)	
.....a community service such as libraries or Freenets?	☐	(GO to Q18b
.....other or unspecified	☐	(GO to Q18b)

Q18b. Does this sponsor coverall the costs?

Yes ☐ No ☐ Don't Know ☐

Q19. About how much a month does your Internet access cost you?

Don't pay anything directly	☐
Less than $5 (US) a month	☐
$6 to$10 (US) a month	☐
$11 to $20 (US) a month	☐
$21 to $50 (US) a month	☐
Over $50 (US) a month	☐
Don't Know	☐

Q20. I will read a list of items. Tell me how important you think each item is as a barrier to the use of the Internet?

Is it highly important, of moderate importance or of low importance as a barrier?

		High	**Moderate**	**Low**
[Read each]	...the cost of micro-computers?	☐	☐	☐
	...the complexity of software	☐	☐	☐
	...the monthly cost of Internet service	☐	☐	☐
	...local calling telephone charges	☐	☐	☐
	...personal skills and confidence	☐	☐	☐
	...fear of computers	☐	☐	☐
	...disinterest or distrust	☐	☐	☐
	...danger to young people	☐	☐	☐

Section 7: Support and Back-up

Q21. Everybody has questions from time to time about computers.

When you have a problem to solve where do you go to for help?

[Check as many as apply]		**Yes**	**No**
[Read each].....	...the company that made the product?	☐	☐
	...another family member?	☐	☐
	...the user manual?	☐	☐
	...friends?	☐	☐
	...co-workers?	☐	☐
	...the Internet itself?	☐	☐
	...computer experts?	☐	☐

...others? [Probe and Specify_____]

Q22a. *[If employed or a student]* How much training in computer use is available to you at your workplace (or school)?

Is it:....[read each].....Quite a lot ☐
....Some ☐
....Very Limited ☐
.....None ☐

Q22b. How about training in the use of the Internet use?

Is Internet training also available?

Yes ☐ No ☐ Don't Know ☐

Section 8: Digital Companions

Q 23. I will read you the names of several pieces of equipment.

Tell me with a simple yes or no if you personally use any of these items, at home, work or school.

		Yes	**No**
[Read each]	.....a FAX machine	☐	☐
	.....a portable cellular or digital telephone	☐	☐
	.....a CD music player	☐	☐
	.....a digital game unit (Sony Playstation, Nintendo, Sega or other)	☐	☐
	.....a hand hold electronic organiser	☐	☐
	.....a laser printer	☐	☐
	.....a computer CD ROM	☐	☐
	.....a digital scanner	☐	☐

Section 9: Sub-culture Markers (Schematic)

Q24. People who work a lot with computers and the Internet tend to use special words for some things.

I will read a list of words. Answer just yes or no if you have heard of any of them...

		Yes	**No**
[Read each]	.....firewall	☐	☐
	.....newbie	☐	☐
	.....alias	☐	☐
	.....hacker	☐	☐
	.....ISP	☐	☐
	.....Ethernet	☐	☐
	.....net-head	☐	☐
	.....Unix	☐	☐
	.....coder	☐	☐
	.....encryption	☐	☐
	.....Wired magazine	☐	☐

Section 10: Institutional Differentiators (Schematic)

Q25. [*If the respondent is working*] Some places where people work are computer and information technology (IT) intensive and other places are not.

Tell me how the place where you work fits in to these descriptions.
Would you say it.....

a) Values computer training	☐	or	does not	Don't Know	☐
b) Invests in new equipment	☐	or	does not	Don't Know	☐
c) Has a V.P. Technology	☐	or	does not	Don't Know	☐
d) Has an *Intranet*	☐	or	does not	Don't Know	☐
e) Has a network administrator	☐	or	does not	Don't Know	☐
f) Values its Internet link	☐	or	does not	Don't Know	☐
g) Spends money on R. and D.	☐	or	does not	Don't Know	☐
h) Promotes innovation	☐	or	does not	Don't Know	☐

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