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A Global Diffusion Model of e-Governance

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ABSTRACT

The extent to which e-governance develops in a country is a function of the collective national and local capital supplying IT services and of informal social and human capital creating a demand for e-governance. Supply requires public officials and citizens to have access to the Internet and access varies enormously according to a country's modern resources and political openness. But the characterization of these differences as a digital divide is misleadingly static. A diffusion model of Internet access shows that it is more realistic to think of cross-national differences in terms of leading and lagging countries; in this model laggards have the potential to catch up with leaders. Differences in the capacity of countries to supply standard e-government services are a consequence of its degree of modern resources and to supply e-participation facilities reflects its political openness and extent of corruption. In countries with a high degree of modern resources and a majority of adults on line, digital choice creates limits as well as opportunities for e-governance, since most non-users of the Internet are older people who see no need for going on line. Among those on line a majority prefer to contact local and central government by traditional means, such as telephone or writing a letter. In the most modern and open societies the diffusion of the Internet is most likely to promote government efficiency and the virtual linkage of disparate public agencies serving the same client. In developing countries it will be one more pressure to reduce corruption and increase bureaucratization and in relatively closed regimes it can threaten destabilization by strengthening dissident mobilization within and across national borders. Globally, the diffusion process will promote openness in 'intermestic' public policies that involve both national and trans-national politics. It will also reduce the proportion of native English-speakers and increase bilingual and bicultural Internet users.

While Internet technology is much the same around the world, states and societies are not. Since governance is about the interaction of the state and society, e-governance is necessarily influenced by its national

context, which is shaped by influences that have accumulated for generations before the Internet was invented. The point is often overlooked in prescriptions based on an ideal-type model of perfect administration that assumes institutions of governance can readily be configured to do what governors want or, in the case of e-democracy, what people who go on line want.

The supply and demand of Internet services, of which e-governance is but one example, are determined by a country's collective and individual capital (Table 1). While some features of Internet capital are of pervasive significance for society, such as its national income, others are specially relevant to the Internet, such as the nationwide penetration of telecommunications facilities. *Collective national capital* is essential for the supply of Internet infrastructure. Low-income countries have been unable to afford heavy investment in telecommunications facilities and governments that censor the print and broadcasting media hesitate to promote a new medium that opponents can use to open up political debate. *Local capital* is a pre-condition for supplying Internet access to a community. In many countries there are great differences between urban and rural areas in the supply of libraries, secondary schools and other facilities where Internet access may be made publicly available. In the absence of Internet infrastructure, individuals do not have a choice about going on line, for the means of doing so are not at hand. This is the context in which most governments operate and in which the majority of the world's population lives today.

Table 1: *Supply and demand determinants of Internet use*

SUPPLY SIDE INFLUENCES: CONTEXT	
Collective national capital	
	National income per capita
	Level and type of telecommunications
	Openness or censorship
Local capital	
	Urban versus rural
	Availability in public facilities: schools, libraries, Internet cafes etc.
DEMAND SIDE INFLUENCES: INDIVIDUAL	
Informal social capital	
	Computer in household or friend has computer
	Friends with email address
Human capital	
	Education and age
	Employment and income
	Psychological openness to new technology

Within a modern society there is ample collective capital to supply the great majority of citizens with a multiplicity of access points for participation in e-governance. Whether this occurs will be affected by demand factors. *Informal social capital networks* influence whether a person goes on line. If there is a computer in the household or an individual has a friend using the Internet this encourages a person to sign on. Since email is a major motive for Internet use, the more people an individual knows who already have an email address, the greater the incentive to go on line oneself. Choices in high-access societies also reflect *individual human capital*, including age, education and income, which influence whether an individual chooses to go on line to access government websites, download music illegally or to do both. Insofar as individuals choose not to go on line or not to dial up e-governance sites, then even if there is 100 percent access in a society and government e-enables all its public services, effective demand will fall far short of the supply and the Internet will not be a general purpose technology transforming political institutions but a specialized tool for use by some citizens but not others and in some but not all areas of public policy (cf. Harberger 1998).

The so-called digital divide confuses two radically different phenomena – differences *between* countries and differences *within* a country. At the global level, the distribution of collective resources creates a magnitude of difference between countries with modern resources supplying Internet access and those where resources are absent. Since differences in modern resources are of long standing, the distribution of collective Internet capital is a consequence rather than a cause of international differences. Similarly, within a country differences of age, education and income that shape individual choices of signing on or staying off line are of long standing. To maintain adequate provision for all citizens, modern governments must continue to provide public services off line as well as on line.

The argument of this article is that the very idea of a digital divide is misleading, because it is static rather than dynamic. The supply of collective and individual capital is changing and the technology of the Internet is making it cheaper, more accessible and potentially more attractive. For example, in poorer countries the number of wireless phone connections are surpassing the number of fixed lines. Therefore, we need to think in terms of a diffusion model in which there are leaders and laggards in Internet use between societies and within societies. Doing so avoids the 'one size fits all' prescriptions of management consultants promoting e-governance; it also shows that the consequences of e-governance will differ substantially in different countries around the globe.

I Supply-side obstacles to Internet access

You cannot have e-governance without Internet infrastructure, and there are great differences between countries in their collective Internet capital. Even after allowing for error margins in national estimates of Internet use, stark contrasts are evident. In its survey of 182 countries the International Telecommunications Union (2003: A60–63) reported nine countries with more than 50 percent of the population already Internet users in 2002, while 40 countries had less than one percent of the population on line. Consistent with the logic of digital diffusion, most countries in the world today are between these extremes. There is no dichotomous digital divide between haves and have nots but a continuum of countries with more or fewer Internet users.

In 59 low income countries *scarcely anyone is on line*; Internet users averaged 1.3 percent of the population. The reported percentage of users drops below one in one thousand not only in very poor African countries such as Ethiopia but also in very repressive authoritarian regimes such as Myanmar and Tajikistan. Where collective national capital is so limited, the diffusion process has yet to begin and it is premature to think in terms of e-governance.

Conditions for *take off* into cyberspace have been met in 51 lower middle-income developing countries, where there is sufficient collective national capital to provide Internet services in cities and most rural areas. An average of five-sixths of the population is covered by facilities that can provide mobile phone access. However, the actual take up of the Internet remains low, averaging 4.9 percent of the population on line. Internet use at this level implies about one in 15 adults and one in about five households having a member who is on line. Iran is an example of an average country.

When public policy and market dynamics have made the Internet accessible locally, then informal social capital can provide vicarious or proxy access to individuals who do not have a computer at home or at work, because they are likely to know someone who is on line, thus creating face-to-face links that can intermediate virtual communication (cf. Lerner 1958; Katz and Lazarsfeld 1955). The limited availability of Internet hardware can be compensated through its use by more people. A single school connection can be used by dozens of pupils, their teacher, and by parents, and an Internet cafe makes money by serving dozens of customers daily. Thus, statistics that tabulate the hardware of access greatly understate the number of people who sign on in a week. A 30-country international survey found that in countries where Internet access is a major problem, most users access the Internet from public facilities such as the post office, library, school or Internet cafe, and more

people access the Internet from the home of a friend than from their own home. By contrast, in countries high in modern resources, the median user goes on line from two different places (Rose 2004: table 8.1).

In upper middle-income countries there is ample collective and local capital to facilitate Internet access. In the ITU survey, Internet use averaged 14 percent. These 30 countries are not backward; they include seven new member states in the European Union. Having taken off, the goal of national governments is *catching up* with the leaders in Internet use. Most citizens can be proxy users, for they are likely to have informal social capital giving them contact with a person who could send an email or draw information for them from the WorldWideWeb.

Leaders are countries with the highest level of Internet use; the ITU report placed 42 high-income countries in this category. Internet use averaged 45 percent of the population, more than 30 times the level in low-income countries. The figures indicate that most adults are on line and most households have at least one member on line. Nonetheless, in countries at the top of the international league, from one-third to almost half the population is *not* on line.

The fundamental determinants of the digital divide between countries are supply-side constraints of collective capital. Factor analysis shows that five indicators – GDP per capita, urbanization, personal computers and telephone lines per thousand people, and the Transparency International rating on corruption – together constitute a single syndrome of modern resources. These materialistic resources are also distinctly different from government's openness, indicated by the assessments of media freedom and civil liberties produced by Freedom House (Table 2a).

Together modern resources and openness account for 78.9 percent of the variance in the percentage of Internet users in countries around the world. (Table 2b)[1] Even though modern resources form a single statistical factor, the indicators within it have followed a separate temporal and causal path. Countries that have long had a high level of Gross Domestic Product per capita were usually early to build nation-wide telecommunications facilities. By the time that personal computers came on the market a quarter-century ago, their populations had already achieved a high level of education and prosperity. Thus, before the Internet developed in the 1990s countries high in modern resources had met the pre-conditions for Internet access. From that perspective, going online was a marginal increment in established patterns of communication. By contrast, the preconditions of access remain absent in countries where GDP per capita is low, there are few telephone lines and fewer computers, and the capacity for e-governance is slight. The problems associated with Internet use are thus a byproduct of persisting national problems.

TABLE 2: *Contextual influence on digital use*

	Modern resources	Openness
A. *FACTOR ANALYSIS OF AGGREGATE DATA*		
Variance explained	54.4%	32.7%
Eigenvalue	3.8	2.3
MODERN RESOURCES		
(*High economic*)		
Gross Domestic Product per capita PPP	0.87	0.43
Urban population	0.72	0.27
(*High technology*)		
Personal computers	0.89	0.31
Main phone lines	0.87	0.42
(*High integrity*)		
TI corruption index	0.85	0.38
OPENNESS		
Media freedom	0.36	0.91
Civil liberties	0.39	0.90

B. *MULTIPLE REGRESSION ON % INTERNET USERS*	b	SE	Beta	t
Modern resources	14.7	0.88	0.811	16.6
Openness	6.9	0.87	0.388	8.0

Adjusted R squared : 78.9%; Number of countries = 90

Sources: Data compiled from http://wwwuser.gwdg.de/~uwvw/corruption. cpi_2003. html accessed 2 December 2003 and www.freedomhouse.org accessed 25 August 2004 and World Bank world development indicators 2002 and 2003. Note that the media freedom and civil rights indices have been reversed for consistency in signs.

The dynamics of economic growth in some parts of the world demonstrate that obstacles to development can be overcome, thus making e-governance possible. Moreover, because national determinants of Internet capital are collective attributes of society, they are particularly amenable to government policies to reduce supply-side obstacles. There is thus scope for promoting public access to computer facilities at schools and libraries. However, Ernest Wilson (2005) cautions that for a society's Internet use to take off requires cooperation between government, private enterprises, NGOs and research bodies to produce the mix of skills and institutions necessary to make this happen. Moreover, there are circumstances in which government attempts to control or monopolize Internet capital discourage use, for example, by restricting investment in infrastructure or placing high charges on users (OECD 2003: 189).

II From digital divide to digital diffusion

e-Governance depends not only on the supply of infrastructure enabling individuals to access the Internet but also on growth in the percentage of Internet users within a society. Whereas the digital divide is about Internet use at one point in time, diffusion theories are about the dynamics of change. In a diffusion model, differences between or within a society are no more than a starting point. Diffusion models are not concerned with whether an innovation has been adopted but when it is or will be adopted.

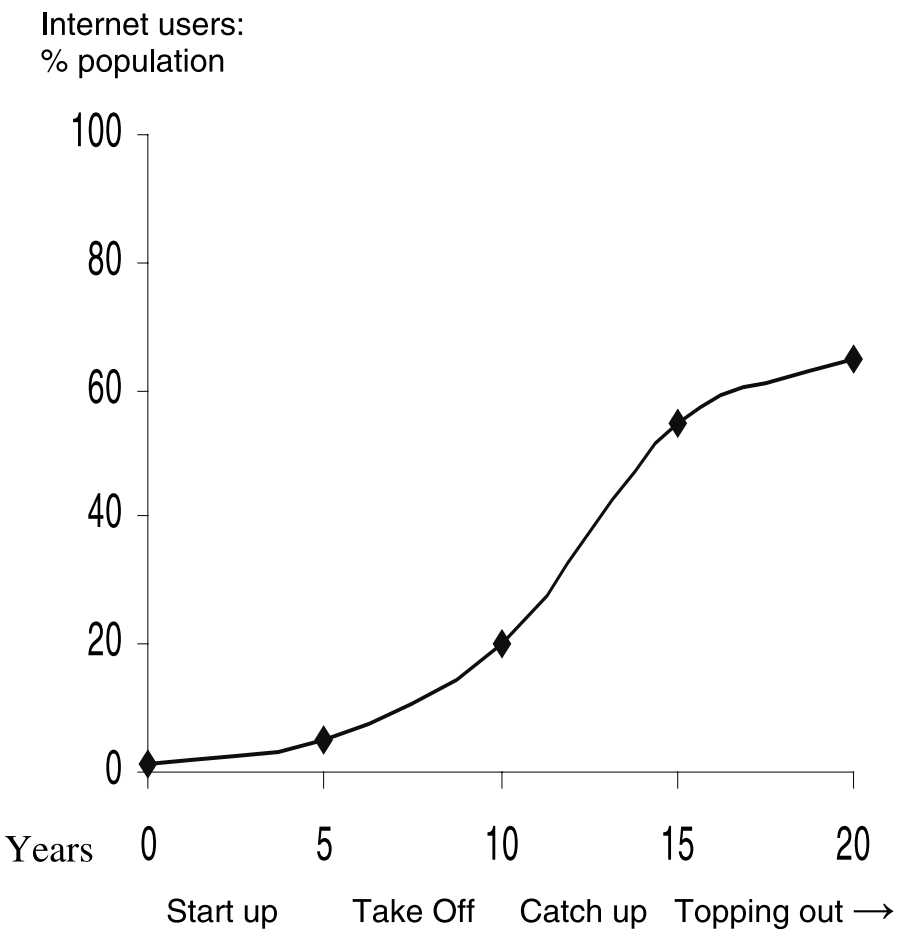
From static to dynamic modelling. The ITU data base about Internet use supports two propositions. The critical assumption is that Internet use worldwide is expanding rather than contracting.[2] The history of the telephone, television and personal computers supports this assumption. Furthermore, given the time lag between national governments preparing user estimates and their publication by the ITU, the latter's statistics cited in this article are under-estimates, because they relate to some point in 2002. A lag of two years is a long time in a society where Internet use is rapidly diffusing. The analytic issue is not whether the global number of Internet users will increase but to what extent and how fast this will occur.

A diffusion model also assumes that rates of growth will continue to vary between countries. At the upper end of the distribution, growth is expected to decelerate and sooner or later flatten, since a country cannot have more Internet users than it has people. Relatedly, growth rates are expected to be fastest in countries in the middle of the diffusion process, due to the advantages of going second and the acceleration provided by the Internet's network element.

The global dynamics of Internet use appear to fit the familiar S-shaped pattern of the diffusion of innovations (see Rogers 1995: 258, 314ff; figure 1). At the initial stage, an innovation spreads slowly among a very small fraction of the population. This is particularly true of interactive network innovations such as the telephone, the fax machine and the Internet, which require others to be adopters to make novel instruments useful. Once this occurs, the process of diffusion accelerates sharply, resulting in a rapid surge in the total number of users as a faster rate of growth is applied to an increasing number of users. Once a country has a large number of users, the rate of growth reduces while still remaining positive. As late adopters are harder to mobilize and the limit of non-adopters is reached, the top of the S-curve of diffusion flattens out.[3]

A diffusion model does not divide countries into haves and have nots but differentiates *leaders and laggards*. Countries at the top of a diffusion

FIGURE 1: *A diffusion model of Internet use.*



Source: For Internet use, author's estimates. On the general shape of diffusion curves, see Everett Rogers (1995: 258,314)

curve are there because they have been first and fastest in pioneering an innovation, while those in the middle or below have lagged behind in adoption. With many technological innovations, the cost of going second, fourth or eighth is usually much less than the cost of going first because of economies of scale due to costs falling, improvements in the quality of services, and followers learning to avoid mistakes by observing what was done by pioneers. Where resources are available, the realization of lagging behind can be a stimulus to catch up rather than remain stigmatized as a low tech society.

Insofar as the process of diffusion has a limit, then leading countries sooner or later reach a saturation point. The flatness of the S curve at the top of Figure 1 reflects this. While the mathematical limit for users is 100 percent, the real maximum is lower, since the conventional definition of Internet users is stated as a percentage of a country's total population. While there is no consensus about what ought to constitute the effective population of potential Internet users, for example, everyone from 10 to 100 or 8 to 80, there is a need to discount use by very young children, very old and the infirm. This indicates that the practical ceiling on Internet use is between 80 and 85 percent of a society's population. Once leading countries have saturated the potential population of Internet users, it becomes easier for laggards not only to make progress but to catch up. Instead of chasing a moving target they are chasing a target that has stopped expanding, a pattern visible in fields of technology as diverse as the telephone, television and automobile (Rose 1995).[4]

III Governments differ in web capacity and openness

The electronic interaction of governors and citizens has two distinct and separate forms. e-Governance is about placing on line conventional activities of government departments such as the movement of files within and between government bureaus; delivering to claimants benefits such as pensions or children's allowances; and ensuring that individuals and organizations meet their obligations to pay taxes and register births. e-Democracy is about using the Internet to open up more opportunities for participation in the political process by citizens and non-governmental organizations. Variations between states in their economic and telecommunications resources tend to reflect differences in their capacity for governance generally (Fukuyama 2004). However, some proposals for e-governance assume that all political systems have the capacity to introduce high tech e-governance services that inscribe rules and assumptions found in an OECD context but not in low-income countries (Heeks 2005). It is also a mistake to assume that all political regimes want to open up the processes of government to public participation and e-democracy.

The web presence of government reflects modern resources. The starting point for a programme of e-governance is that public agencies have web sites informing citizens about their activities. However, e-governance goes far beyond the mere supply of information: it is also about using IT to deliver services on line. The extent to which this is done varies greatly. The generic hypothesis is: *The greater the modern resources of government, the more sophisticated its Internet presence*.

The UN Division of Public Economics and Public Administration (UN DPEPA 2003: 1, 30ff) has created a four-stage model of e-governance, defined as 'utilizing the Internet and the WorldWideWeb for delivering government information and services to citizens'. In collaboration with the American Society of Public Administration, it made an elaborate assessment of services offered by UN member states in 2001. While many countries have become more sophisticated since the assessments were made, it provides an ordinal scale of stages in the development of e-governance and the relative position of most countries is likely to remain the same.

In 32 countries from Angola to Yemen government web presence was *minimal*. Web sites were accessible for some departments, but they only gave basic information of the sort found in a printed brochure or in a reference volume. Like a printed book, a static web document can be several years old.

An *enhanced* web presence requires the addition of more specialized web sites that provide information going deeper into the structure and activities of a department, for example, details about bureaus and sub-departments within a government ministry. It also requires regular updating of information and links to other web sites. An enhanced web site can highlight fresh information in a What's New section and include Frequently Asked Questions. A total of 64 countries from Algeria to Zambia have already reached this level. A citizen dialling up an enhanced web site can obtain a significant amount of information about what government is doing – but no more.

An *interactive* web site enables citizens to be active users, inputting requests as well as obtaining a substantial variety of information from a web site. There are search facilities to interrogate complex data bases, and useful hypertext links between web sites. An interactive website not only offers email addresses for sending enquiries but also enables citizens to download forms and email them to the relevant government agency. As of the time of the UN evaluation, 57 countries were already providing interactive Internet facilities to citizens. The category includes countries as distant from the attention of Internet theorists as Argentina and Thailand.

When a government reaches the *transactional* stage of e-governance it makes decisions on line and informs citizens of what action has been taken on their requests. Thus, a citizen may be able to register a birth and print out a birth certificate on line, or to complete a tax form, have taxes calculated, and make a payment on line. This is not rocket science: it is an every minute occurrence in the online booking of airline and entertainment tickets. The UN review found the transactional level of e-governance had been attained by 17 countries from Australia to the

United Kingdom and United States. Since this number is only about half the membership of OECD countries, wealth per se is not a sufficient condition for providing transactional services. As of 2001 Japan was not yet making many transactions on line. Nor was national wealth a necessary condition, for countries such as Mexico and Portugal had already started processing transactions on line.[5]

Differences in the capacity of national governments to develop e-governance reflect differences in modern resources. A multiple regression analysis using the same two factor scores as in Table 2 explains 70.2 percent of the variance in web presence. The modern resources factor is the only significant factor (Beta: 0.84). Modern resources not only include money and telecommunications hardware but also bureaucracy, as shown by the Perception of Corruption Index of Transparency International (www.transparency.org). loading being included in this factor. Bureaucratic institutions are rule-based. Rules specify what information can be collected and entered into forms, how it can be verified, eligibility for benefits or charges, and how a service will be delivered. The algorithms that control computers and Internet systems are rule-based too. If a government is to reach the transactional stage of e-governance, it must have bureaucratic procedures that operate according to impersonal rules rather than by decisions made on the basis of personal friendship, client-patron relations or corrupt incentives.

If a public service is bureaucratized, e-governance becomes a matter of shifting onto the Internet interactions that are already taking place over the counter, by post, or by telephone; the impersonal algorithms controlling service delivery remain much the same. A computer can then be programmed to request information on line from users, retrieve records, process them, make decisions, inform citizens and make a transparent record of what has happened. The advent of broadband makes it possible to do so at great speed and makes public services available 24 hours a day, 7 days a week. In the absence of rules, an Internet service becomes little more than a substitute for a narrative letter or phone call between a citizen and a public official.

Government as an obstacle to e-participation. In principle the Internet makes it possible for anyone anywhere anytime to voice a demand to their governors. It has thus stimulated a vast literature about individuals using the Internet to make government more responsive to their preferences. However, e-participation is fundamentally different from the delivery of public services on line. It requires governors to pay attention to the political opinions of those they govern. But do governors want to listen? This fundamental political question is often overlooked by advocates of e-democracy, who confuse what is technically possible and politically acceptable in the world's freest countries

with the existential situation in most countries. The median member-state of the United Nations is not driven by electoral influences; it is aptly characterized as partly free and some are definitely unfree. Media freedom varies too; the median country is described as 'partly open' (www.freedomhouse.org). The generic hypothesis is: *The greater the government's acceptance of civil liberties and media freedom, the greater the provision of e-participation facilities.*

The United Nations Department of Economic and Social Affairs (2003: 19ff) has created an index intended to measure the extent to which governments offer facilities for e-participation. The first of the index's three components, e-information, incorporates many elements of its sister agency's measure of enhanced e-government, adding references to web forums and chat rooms. The second component, e-consultation, concerns the extent to which government web sites enable citizens to exchange views electronically with policymakers and with each other. The third component, e-decisionmaking, refers to government's professed willingness to take citizens' view into account and to report outcomes electronically to individuals who email their opinions.

Notwithstanding problems of measurement, the results are unambiguous: a majority of government web sites do little to encourage e-participation. The distribution of scores is very skewed. While the United Kingdom achieves an e-participation score of 58 and the United States a score of 56, more than nine-tenths of countries evaluated have scores less than half that. The median score is 3, and 41 countries are assigned an e-participation score of 0. The UN evaluators conclude: 'Across the board, with very few exceptions the willingness of governments to use ICT for e-participation is lower – and in some cases much lower – than their web presence' (UN Department of Economic and Social Affairs 2003: 20, 225ff).

Whereas the launch of a web presence is no more than the transfer of printed information to the screen, e-participation involves a significant change in the way governors conduct their affairs. It creates a virtual dialogue with the governed. The dialogue makes bureaucratic officials open to public scrutiny and makes elected officials subject to pressures from outside the inner circle of political elites. When a government is engaged in corrupt practices that violate national laws, the introduction of e-participation threatens to publicize their misdeeds and strengthen their opponents. In sum, e-participation challenges the existing distribution of political power between governors and governed. As long as those in power do not want to open up their affairs to public demands and scrutiny, they have a direct interest in not introducing e-participation. A multiple regression analysis supports this interpretation. A total of 41.2 percent of the variance in the extent of

e-participation can be explained by a single variable, the level of corruption. The less corrupt the government, the more likely it is to encourage e-participation (Beta: .59). Even though e-participation is also about letting citizens express views freely to governors, the index of civil liberties and media freedom is not a significant influence. This suggests that the chief obstacle to the supply of e-participation facilities is the desire of governors to continue using public office for their corrupt and private benefit.

IV Digital choice as an obstacle to Internet use

While the infirmities of government and the lack of modern resources are the primary obstacles to expanding e-governance in most countries, where collective Internet capital is high, access is hardly a problem. If they want to so, the great majority of citizens can access the Internet from a multiplicity of points. For example, the average Briton has four different places where he or she could go on line, including public facilities such as the local library or an internet cafe; school; at home and/or at a friend's house. During a typical week the average British Internet user signs on from at least two different places (OxIS 2003).

Once a society has the collective capital to offer citizens multiple points of access, technological determinism is reduced and individual choice becomes more important in determining whether people go on line. In the 42 high income countries assessed by the ITU, modern resources and openness explain only 40 percent of the variance in Internet users, compared to 79 percent explained when poor, developing and developed countries are combined in a regression analysis (cf. Table 2).

As usage expands, the digital divide shrinks. When a majority of adults are on line, they tend to be average rather than privileged citizens. The higher the proportion of the population that goes on line, the less significant social differences become. If a majority of both men and women are Internet users, as in the United States, where 54 percent of men and 54 percent of women are already Internet users in 2001, it is misleading to speak of a gender divide (OECD 2003: 195). Where bivariate correlations show an association between social differences and Internet use within a country (OECD 2003), statistical significance should not be confused with substantive impact. While there are differences in access by race and ethnicity net of other influences, such as income and age, they are differences in degree rather than kind. For example, 41 percent of Latinos are on line as against 54 percent of white non-Latinos (see Mossberger et al. 2003: 32ff). Moreover, differences in degree are not equal. For example, while the Oxford Internet Survey (OxIS 2003) found a gender difference of 9 percentage points in the use of the Internet and

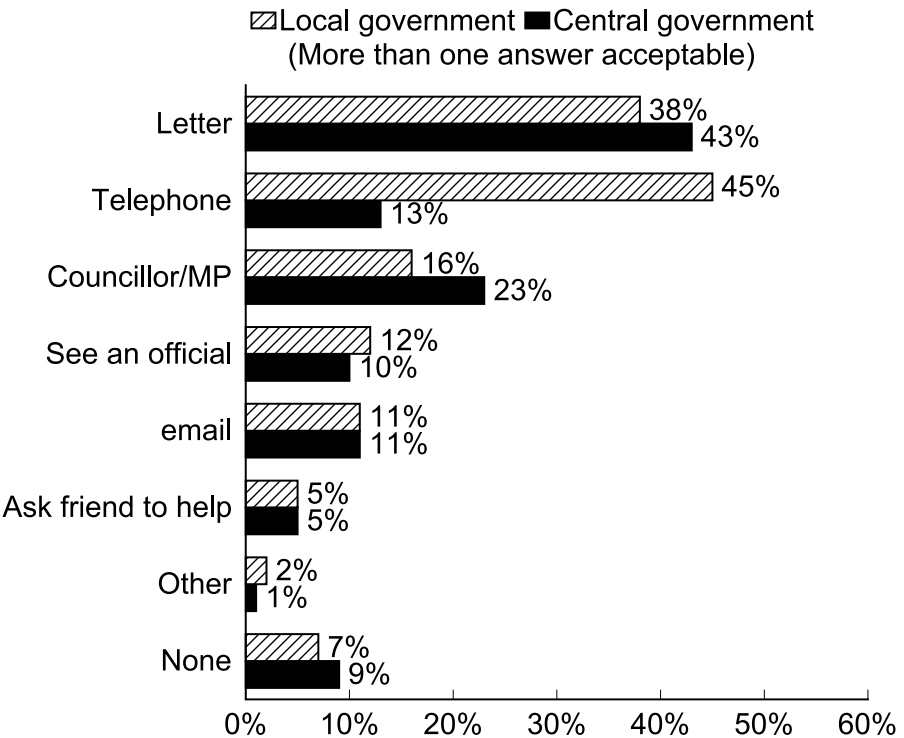
a 29 percentage point difference in use between people who are middle class and those who are not, there is a 76 percentage point difference between young people still studying (98 percent on line) and persons of retirement age (22 percent).[6]

Where the Internet is familiar to most people, Internet use is best conceived as a matter of digital choice. Given a choice, some people do and some don't go on line. When those on line are free to choose whether to go to a government web site or go shopping, more people prefer to go shopping. The analytic question becomes: *Where Internet access is pervasive, why do some men and some women choose to use the Internet while others do not?*

In countries where collective Internet capital provides a plentiful supply of access points, non-users as well as users of the Internet are aware of its potential uses and could invoke informal social capital to sign on. The Oxford Internet Survey (OxIS 2003) found that two-thirds of non-users know someone who could send an email or look up a website on their behalf. Among non-users, the largest group, 44 percent, are informed non-users, for even though they could have someone access the Internet on their behalf, they have not bothered to do so in the past year. Proxy users are 22 percent of total non-users: they have asked someone to send an email or get information from the web. Technophobes who don't want to know about new technology are only one-sixth of non-users and seven percent of all Britons. Likewise, those who are excluded because they do not know anyone who could access the Internet on their behalf are only seven percent of the population. The primary characteristic of non-users is not low income or ignorance[7] but age. By definition, older people have lived more than half a century without going on line and today most are indifferent to the putative advantages of Internet use.

Digital choice implies a ceiling on the potential for e-governance: a significant minority of citizens will not go on line and, among those who do a significant portion will have no interest in what government does. Most Internet users do not go on line to follow political news or to access e-government web sites; the most popular uses of the Internet are for such things as emailing family and friends and use at work. Furthermore, a society high in modern resources offers citizens a multiplicity of channels for exchanges with government. When the OxIS survey (OxIS 2003: q.A13) asked Britons what they would do if they had a problem that they wanted local or central government to deal with, more than nine-tenths volunteered at least one practical step they could take; few felt excluded (Figure 2). A phone call was the most often cited means of communicating with government locally. Sending a letter was most frequently mentioned for contacting central government and was also very important for local government. Face-to-face contact – whether with an elected councillor or MP or with a agency official – came next.

FIGURE 2: *Preferred media for communicating with government*



Source: Oxford Internet Survey (OxIS), results of a nationwide representation survey of Britons aged 14 and older, 23 May–28 June 2003. Numbers of respondents: 2,030

Sending an email was mentioned by only 11 percent of respondents. The great majority of people who use the Internet do not think of using it to contact their elected representatives for help.

V Implications of Internet diffusion nationally and globally

The technology of the Internet is continuously diffusing around the world. The above UN and ITU figures, based on evidence collected in 2001 and 2002, substantially understate what is happening today. Yet differences in national context will continue to result in the impact of the Internet varying with national context from a marginal increase in efficiency to the threat of political destabilization according to the degree to which a government was already rule-bound and open. At the global level, the Internet's significance for trans-national as well as national communication will be a consequence of differences in the international

displacement of national populations. A 4 percent growth in Internet use in China or India is of a different order of magnitude than the same percentage growth in Canada or Finland.

H 1: Efficiency. *If a government is already bureaucratic and open, e-governance will produce marginal increases in efficiency and citizen satisfaction*. By definition, a bureaucratic system is rule bound, and rules require the continuous processing of information, filing and retrieving records, and applying impersonal rules to arrive at decisions. New technology can raise the level of efficiency at the margin by reducing the number of personnel required to do the paperwork involved in collecting, collating and acting upon the flow of information that is the everyday activity of governance. The IT revolution has already shown how this can be done in fields where claims for entitlements are very rule bound, such as social security. But this will not transform the delivery of labour-intensive services such as primary school instruction, hospital care or fire protection.

In countries where there is limited scope for increasing the percentage of Internet users, there is substantial scope for government to expand the use of e-governance services. Insofar as IT and administrative legacy systems have hobbled efforts to capture the full benefits of the Internet, the greater the potential scope for improvement by shifting from a supply-side approach, such as the British government's emphasis in putting public agencies on line, to a user-oriented approach that increases the ease and advantages of citizens going on line to conduct transactions with multiple public agencies that were previously undertaken by post, telephone or in person. While a single seamless portal for the whole of government is likely to remain a chimera, government can adopt a strategy of 'bounded seamlessness', for example, having a single point of entry for policies related to the birth of a child or changes in employment affecting taxation and social security (cf. Westholm 2005; Zuurmond 2005). The deterioration in established public services, such as the post office, provides a push for individuals to go on line. There remain limits to what can be achieved. Government cannot make it compulsory to use the Internet by shutting down all non-electronic means of communicating with citizens, because it has an obligation to provide services to all citizens and to enforce obligations, such as the payment of taxes whether or not a citizen is on line. Moreover, public agencies hesitate to emulate private sector organizations by offering discounts for using public services on line.

H 2: Information explosion. *If a government is already open, the introduction of the Internet will increase the quantity of political information for use in articulating political differences*. In a free society with modern resources, there is already plenty of political information: the problem is how to process that information. The Internet increases the quantity of information in

circulation, the speed with which it moves, and the distances it can travel within and across national boundaries. However, it does not increase the time available to absorb messages. Insofar as the time allocated to politics is constant, then the median citizen with some but not too much interest in politics will consume a decreasing proportion of an increasing amount of information. Elected representatives faced with more communications from interested citizens will have greater incentives to develop expert systems to produce stereotyped responses.

Democratic dialogue involves the expression of conflicting opinions about what government ought to do. Increasing the input of conflicting opinions to political discussion may add more heat than light to political discourse. Insofar as participants in on-line expressions of political opinion value substantive outcomes more than the right of consultation for its own sake, then some participants will be dissatisfied with the policy outcome of the dialogue. Whether consultations are on line or face to face or both, the Internet does not dispense with the decision-maker's need to reconcile competing political demands and arrive at decisions that will satisfy some but not all of the participants.

H 3: Inspection and reform. *If a government is not rule bound, the introduction of the Internet offers incentives to improve bureaucratic effectiveness and integrity*. Where standardized bureaucratic records are not kept, a proposal to go on line will have an 'inspection effect', because e-governance can only operate effectively *if* bureaucratic records exist and bureaucratic procedures are routinely followed. Snellen (2001) calls attention to the use of information technology to reduce the discretion of street-level bureaucrats in societies with modern resources. In developing contexts, the prospect of Internet-based services ought to act as an incentive for reform-minded officials to modernize public administration as a pre-condition of introducing e-governance. To ignore this pre-condition invites failure, as is evident in many attempts to import first world e-governance practices into third-world systems of administration (Heeks 2005).

e-Governance has the potential to reduce corruption because it can make public administration transparent and allocate services according to rules. For that very reason, it encourages those benefiting from existing practices to put obstacles in the way of making government bureaucratic and transparent on line. Kluver's (2005) analysis of the Internet strategy of the Chinese government emphasizes that Beijing is trying to create an Intranet system that will increase central control over its own regional and local offices in order to reduce its apparatchiks exploiting subjects at the grass roots and potentially undermine the Communist party-state. In the words of the former prime minister, Zhu Rongji, in China the emphasis is not so much on the *e* but on *government* because of the need

to achieve the 'transformation of government in terms of management systems, management values, management patterns and management methods' (quoted in Rose 2004: 358; see also Dickie 2004).

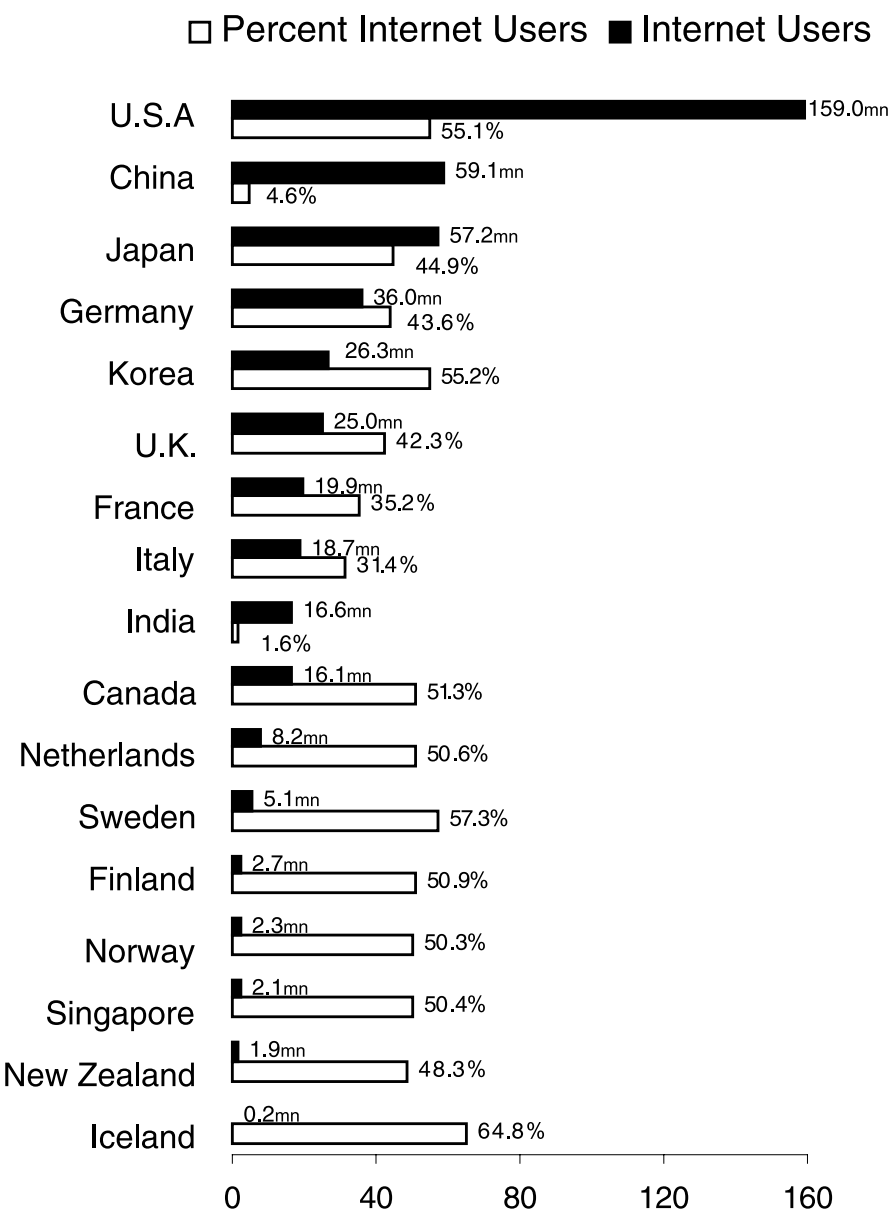
H 4 Regime destabilization. *If a government is not open, the introduction of the Internet can be used to mobilize political opposition through e-dissent.* In a partly free or unfree society, the circulation of information nationwide is through state-controlled broadcasting and print media. However, control of the flow of information through the Internet is far more difficult because information can be circulated through e-mails flowing at a volume that is impossible to monitor thoroughly. In every society, the Internet offers non-governmental organizations (NGOs) a low cost way of communicating with members, making contact with potential recruits in society at large and establishing trans-national links (Bruszt et al. 2005).

A corrupt and unpopular regime is politically vulnerable insofar as the Internet offers dissenters an opportunity to publicize abuses of power and organize opposition both on line and through the mobilization and coordination of large street demonstrations against the regime. Indonesia is said to have experienced 'the first Internet revolution' (Hill and Sen 2000). Trans-national NGOs find the Internet especially valuable because it reduces greatly the barriers that distance creates for mobilizing members and makes it possible for anti-globalization groups to coordinate protests against major trans-national institutions (della Porta and Mosca 2005). A regime that recognizes the destabilizing potential of the Internet can take counter-measures to protect itself against e-dissent. The Chinese regime has sought to control information flows, at least between the People's Republic and the rest of the world, through blocking access to a range of foreign cites, a practice in which foreign Internet Service Providers have cooperated (Dai 2000). Franda (2002: 194) argues, 'With more than 200,000 different routes around the major nodes of the Internet, attempts by Chinese authorities to programme blockages in large numbers of routes would render Internet service almost unusable'.

The changing global population of Internet users. Cross-national comparisons of Internet services normally rely on statistics about the percentage of Internet users in a society. In the latest ITU ranking, the countries highest in the percentage of Internet users are Iceland, Sweden and Korea, followed by the United States, Canada, Finland, the Netherlands, Singapore and Norway. All these countries already have more than half their population on line (Figure 3).

When countries are ranked by the absolute number of Internet users, a very different picture emerges. There is no statistically significant correlation between a country's population and percentage of Internet users (− 0.02). The two countries with the largest number of users, the United States (159 million) and the People's Republic of China

FIGURE 3: *Number and percent of Internet users unrelated*



Source: International Telecommunications Union www.itu.int/ITU-D, accessed 24, August 2004. Countries listed are the ten highest by % population that uses the Internet and/or the ten highest in total number of internet users. Less than 20 countries shown because the United States, Japan and Germany are in both categories

(59 million), are at opposite ends of a league table ranking countries by their percentage of users. The number of Internet users in the five Nordic countries with more than half the population on line is less than the number in India, where only 1.6 percent of the population count as users. Countries with at least 10 million Internet users not only include populous and prosperous countries such as the United States and Japan, but also Mexico, Brazil, India and the People's Republic of China.

The global population of Internet users is on the threshold of radical change, given faster rates of Internet growth in take off countries, a ceiling on growth in high user countries, and vast differences in national populations. The driving force in the global expansion of the Internet are the countries now entering the take off stage; they have a population of more than 3 billion people – and the People's Republic of China and India together account for three-quarters of this total. By comparison, the population in high user and catching up countries is half that, and a similar size in countries scarcely on line.

While the United States currently has more than double China and India's combined number of Internet users, its potential for growth is limited. If an additional 80 million Americans became Internet users, there would be virtual saturation. A five percentage point increase in the proportion of Internet users in China and India would leave both countries with less than 10 percent of their population on line, but would add more than 100 million users there, thus making the combined total of Internet users in China and India exceed that of the United States.

However, in the absence of a global state, the global diffusion of the Internet does *not* create global citizens. Among the various organizations using the Internet – commercial, entertainment, scientific and educational – government is distinctive because it must use its national language to communicate with its primary audience, its citizens. From a nation-building perspective, e-governance has the incidental feature of being a bonding device, drawing people together within a shared linguistic and cultural setting. The principal language of a Hungarian government website remains Hungarian (www.magyarorszag.hu/ugyintezo) and of a Thai website remains Thai (www.thaigov.go.th). Even when government websites include an option to access information in an international language, typically English, the coverage is usually superficial, and a user who wants detailed information must switch to the national language.[8]

The increase in 'intermestic' policy issues that have both a domestic and international dimension has created political pressure to develop trans-national bridging communications, including websites. Bridging communications require a *lingua franca*, that is a common language that is used by people as a second language. The need for bridging

communication is most evident in the 25 member states of the European Union, which collectively have more official languages than India or the Middle East, and have hundreds of dyadic combinations for translating between home languages. In practice, English has become the *lingua franca* for communication within the European Union, and for most international and multi-national organizations.

The use of English as the *lingua franca* of the WorldWideWeb may appear to favour Anglophone countries; Joseph Nye (2004) goes further, citing it as an example of the 'soft power' of the United States. However, as the number of EFL (English as a Foreign Language) speakers and internet users is now greater than the number of Americans speaking English at home, much communication in English does not involve Americans. This is most evident in its use as a bridging language between countries within Europe and as a bridging language within India and within South Africa, where relatively few citizens are native English-speakers.

Internet communication requires more than a common technology and a *lingua franca*; it also requires a common understanding of the context in which each communicator is embedded. For example, the literal translation of a term such as *Rechtsstaat* does not convey the word's meaning in its original context of European theories of law and the state. In trans-national politics, bridging through the Internet offers soft power to those who are cosmopolitan, that is, understanding a multiplicity of contexts. Those who are bonded to their national context will interact with EFL-speakers in ignorance of the context from which the latter are speaking. At best, this creates an asymmetry of understanding. At worst, it creates an asymmetry of soft power, in which those who understand where other countries are coming from become arbitrageurs who can extract political profits from cosmopolitan understanding (Rose 2005).

NOTES

1. The number of countries included in Table 2 is substantially less than in the ITU report because of missing data for some indicators, particularly the Corruption Index of Transparency International. The omitted countries tend to be low in income and/or population and often are those where data is least reliable.
2. While any assumption is probabilistic, the likelihood of it being correct or incorrect is not equal. Since the likelihood of a contraction in Internet usage in the coming years is far less than 0.5, the risk of error is greater if one assumes that the number of Internet users will remain static or contract.
3. As the number of users in a society expands, drop outs who sign off the Internet introduce a wedge between the gross number of new users and the net increase in total users. Some drop outs are only temporarily off line, having lost an Internet connection by moving house or changing jobs. Thus, a portion of increase in users comes from 'returnees' to the Internet rather than from 'converts'.
4. Of course, leading countries may remain innovators in the uses of the Internet or IT technology such as broadband or online access from cell phones. But differences between those over the threshold dividing users from non-users is not relevant to the primary concern of e-governance, namely, whether or not citizens are on line.

5. At the time of the UN evaluation, no country was identified as providing seamless transactional services that linked data bases in different public agencies in order to provide a service to citizens. Contributions to this special issue by Zuurmond and Westholm show that this is now being achieved by some agencies in some European countries.
6. Since age is an important influence on gender (older women live longer than men), education (youths received less education a half century ago than today) and income (retired persons have a lower income than those in work), multivariate statistical analysis is essential to determine the extent to which different social characteristics influence Internet use after controlling for other influences.
7. In fact, a big majority of young Britons classified by examination performance as illiterate, innumerate or both, nonetheless report that they are Internet users.
8. There are a number of multi-lingual ex-British colonies where English has the status of an accepted language of communication in government, even though it may not formally be an official language (see Crystal, 1997: chapter 2).

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