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# Information Society

## Networks, Collective Action and the Role of Institutions

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*Abstract: The knowledge economy and knowledge society depend on the development of networks of communications in terms of both physical possibilities of national and international infrastructure, and the inclination of individuals to participate in these. The rapid spread of such technical capacity, and the rise of wireless methods of communications enables many countries that might previously have been prevented from developing such an infrastructure to rapidly develop capacity. This physical development has reduced the costs of communications and consequently information, as well as the freedom to communicate internationally and, implicitly, inter-culturally. It is also recognised, however, that a range of social and economic factors influence the attitudes of individuals towards such communication, and also the possibilities of collective action both within and across nations, depending on the economic and social costs and 'payoffs' of such activities. The growth of low-cost information provision and low-cost international communications using the internet has raised the potential benefits of such facilities so that it is changing much of the nature of economic interaction in modern, as well as more traditional societies. Whether or not it will demonstrate a similar significance for the development of and information society remains to be seen, but parallels can be drawn between such changes and the existing analysis of networks, organisations and political 'collective action' from the grass roots level. Networks form a significant complement to the existing media that are also seizing on the potential of this modern technology, and constitute a source of general, or more specifically valuable information to individuals in society*

Keywords: Institutions, Networks, Information Society

### Introduction

**T**HE CONCEPT OF the information society appeals to a wide range of disciplines and authors as one that captures the essence of the changing society that we live in today. What it specifically means in practice remains uncertain, however, as does the nature of its emergence (Webster, 2004b and contributions to Webster, 2004a). Some see the information society as a form of post-industrial society demonstrating increased 'technocracy' and bureaucratic control (Urry, 2004) whilst others see it as an increasingly volatile new economic system where information flows radically alter values and flows of business and employment, and flexibility and networks are key for survival (Castells, 2004). Certain essential features can, in spite of the widely ranging views, be identified from the literature. The centrality of information to many functions of the modern economy is one recurrent feature, requiring changes in many aspects of our lives such as leisure, employment and education. Knowledge-based activities are growing to dominate the developed economies, with the OECD (1996) estimating knowledge industries constituting over 50 percent of national GDPs, and accounting for the majority of economic growth (Information Society Commission, 2002).

Both governments and international organisations are now focussing on the 'information society' as an important development to increase accountability of states to their citizens as well as to prepare for the emerging 'knowledge economy' in which individuals' roles will be fundamentally changed by the nature of information and communications technology or 'ICT' (OECD, 1996; Information Technology Advisory Group, 1999; Information Society Commission, 2002). International development programmes encouraging the development of 'civil society' groups which promote democratic interests and monitor the conduct of states need to recognise the potential for creating much needed civil society groups independent of traditional influences (see Gupta, 1997, for the problems of traditionalism in civil society) and the prospect of information society constituting some form of 'digital' civil society is relevant to this problem, hopefully promising many wider benefits from the development of countries' ICT infrastructure (see for instance Moodley, 2005). However, the 'knowledge economy' and information society depend on the development of networks of communications in terms of both physical possibilities of national and international infrastructure, and the inclination of individuals to participate in these. The rapid spread of technical capacity, and the rise of wireless methods of communication enabled



many countries that might previously have been prevented from developing an ICT infrastructure to rapidly develop capacity, as well as to further develop social, political and economic forms of capital (African Development Forum, 1999; DOT Force, 2001). Despite the problems of its implementation, this physical development has reduced the costs of communications and consequently information (Akhtar, 2001), and increased the ability to communicate nationally, internationally and, implicitly, inter-culturally.

A range of social and economic factors influence the attitudes of individuals towards such communication, and also the possibilities of collective action both within and across nations, depending on the economic and social costs and 'payoffs' of such activities (Olson, 1965; Woolcock, 1998). This in turn has raised the potential net benefits of networking and collective action so that it is changing much of the nature of economic interaction in modern, as well as more traditional economies. Whether or not it will demonstrate a similar significance for the development of an information society, rather than economy, remains to be seen. Parallels can be drawn between this situation and the existing analysis of networks, organisations and political 'collective action' from the grass roots level.

Networks form a significant complement to the existing media that are already seizing on the potential of modern technology. Networks can constitute a source of general or more specifically valuable information to individuals in society. The different forms of network that exist vary from simple communications types such as the telephone, to more technically advanced networking of information in the internet, and the complex network relationships of society. The role of social networks, in particular, has been analysed in relation to the development of democracy, and prosperity, by international financial institutions due to their significant impact on attempts to promote economic development in their client countries (Henderson, 2002). The growth in access to and provision of information appears to affect the role of many important groups and institutions in modern societies. It appears intuitively obvious that civil society groups, and consequently democracy, can be strengthened significantly by access to accurate and plentiful information from this new global ICT infrastructure. Thus 'information society' appears capable of creating an 'open society' of responsive democracy as predicted by social scientists such as Karl Popper. Due to this association Popper (1945/2002) is often cited as one of the possible inventors of the concept, although there is no shortage of alternative 'inventors' (Webster, 2004b)

Wide variation exists between the various estimates of the growth and value of networks in practice.

Sarnoff's law states that broadcast networks, where a single source of information exists and the information has many recipients, are valued as proportional to the number of members  $n$  (Odlyzko & Tilly, 2005). Metcalfe's law, which is assumed to apply to communications networks, suggests that the value of information in a network is proportional in value to the square of the number of members: technically the number of relationships is  $n(n-1)$  or  $n^2-n$ , as each member has  $n-1$  other members that they are connected to, and the extent of relationships is the 'value' of a network (Emery, 1976/1981; Odlyzko & Tilly, 2005). Some estimates have been even more generous, assuming exponential growth. The information society literature is optimistic in its assessment of the growth of the internet, assuming rapidly growing benefits from ICT growth. This mirrors the optimistic assessments of the Federal Communications Commission in the U.S., as well as large numbers of investors, which underpinned the over-optimistic valuations placed on the boom-and-bust companies of the dot.com bubble that burst so dramatically after September 11<sup>th</sup> 2001. Even assuming that these 'laws' hold, it is debatable whether the internet is a broadcast or a communications network. Much use of the internet is to access information, as in broadcast networks, rather than to interact and so Sarnoff's law is probably the safest estimate to rely on. Certainly the stock markets' downward 'correction' of values suggests that current thinking is somewhat more pessimistic than in the early days of the dot.com boom. A similar conservatism may be sensible in evaluating the prospects for information societies in the light of this.

The purpose of this paper is to demonstrate the difficulties inherent in the development of an information society, and show that the development of institutional economics and information economics enables us to predict certain patterns to the development, or underdevelopment, of effective information societies. It then reviews the evidence to date on the extent to which information society has developed, and assesses how likely it is in view of this to reach the potential originally indicated.

## Economics and Information

To restate our most basic point, 'information' is the common focus of all models of the information society. This apparently simple point, like so many, is of course one hedged with conditions, and in particular the uncertain meaning attached to 'information' is one of the most important. Epistemology, or the theory of knowledge, is the philosophical field analysing information, and it is one of the most notoriously complex areas of the subject. Knowledge may be held with varying degrees of certainty, and is dependent on information for its creation. The sources

of this information differ sharply in nature, and therefore in the extent of their 'certainty', although assessments of the various sources of information vary between schools of thought.

Generally knowledge can be gained through information from one of four sources: from the appeal to authority; from experience; from logic; and from intuition. Authority refers to secondary, second-hand information whose reliability must be taken on authority, i.e. an individual must trust the source of information to be valid. Experience is the basis of 'inductive' and 'positivist' approaches to knowledge that rely only on direct observation for 'certain' knowledge, and discount other forms. Judgements of the 'truth' of propositions here depend on their consistency with observable 'facts'. Logic is the basis of 'deductive' views of truth as suggested by Descartes' *Cogita*: the belief here is that logic is capable of identifying essential truths, truths that are obscured by the influence of the senses in the process of observation. For instance the simple proof of existence that 'Cogita ergo sum' or 'I think, therefore I am.' Judgements on the truth of propositions here might depend on their coherence with other deduced principles. Finally intuition is a form of discovery of knowledge that develops from subconscious rather than conscious processes, and can result from the mind's connection of disparate propositions and observations that arise from the individual's experience. This may produce creative ideas, but is largely impossible to 'audit' for its validity, and so is seen as the least scientifically satisfying. It may be associated with the principle of 'emergence' in complex systems and particularly in the Gestalt view of psychology, which rejects the confidence placed by positivists in the 'deterministic' nature of existing systems as misguided due to the complex and interrelated nature of elements in the real world, so that it defies explicit analysis and evaluation (Angyal 1941/1981). The problems of assessing which form of information is reliable, and capable of creating certain knowledge, are obvious.

Information, knowledge and data are different, but confusingly related elements of the information society. The development of information and communications technology has enabled the rapid transfer of data, or simple facts, relatively efficiently and with little loss of accuracy throughout the world. It has also enabled the reproduction of such data at little or virtually no cost, an idea that would have been unthinkable to those in the middle ages who developed the original 'media technology' of the printing press. Consequently the availability of data has grown to an extent that has caused changes in the social and political structures of modern economies as well as fundamental changes in people's behaviour and expectations. In earlier times both cost and

the tendency of certain communities to monopolise data would have made this modern form of society unthinkable.

It is important to realise, however, that the ability to rapidly and cheaply reproduce and transfer data does not constitute the reproduction and transfer of information, or knowledge. Knowledge and information management requires data management, but this is insufficient in itself. Information requires the imposition of meaningful structures on data, and knowledge is essential to the process of analysing and structuring such data into meaningful information (Tuomi, 1999, p.107). The recent interest in the development of ICT infrastructures in order to foster the development of democracy and an 'information society' is therefore somewhat misguided in its assumption that the facilitation of data provision and management is sufficient to make significant democratic changes occur. Such changes may improve the access to data, but the role of ability, culture and education in the creation of knowledge remain problematic.

Economics has long considered the difficulties that individuals experience when trying to gather and use 'data' and has concluded that it is unlikely that individuals will generally have the ability to identify their optimal, or most beneficial behaviours (see for instance the analysis of decision making and uncertainty in Keynes, 1937; Knight, 1921). In its more recent form, institutional economics has also presented an outline analysis of political, social, economic and legal institutions that demonstrates how even agents in possession of full information may find that institutional factors restrict their ability to act in pursuit of such goals, or may restrict their benefits due to the sometimes extensive costs of institutional adjustment necessary to the pursuit of individuals' goals or strategies (see for instance North, 1971; 1984). A fuller examination will be conducted, below, of the likely development of the information society in view of this body of economic theory.

Information is of obviously central importance to economics, as a subject addressing decision-making both directly and indirectly. It is therefore surprising how simplistic the treatment of information has been. Much of the classical and neoclassical economics followed an assumption that individuals had all relevant information (presumably costlessly) and the capability to use it to its full advantage, as criticised by Veblen (1899) who described any such individuals as 'lightening calculators' of economic benefit, and little more. Other economists in the neoclassical synthesis assumed no significant influence of information so that wages, etc., were assumed to be 'sticky' and their implications for the economy were simply mapped out (Akerlof, 2002, p.365)

Away from the mainstream of economics, heterodox economists have recognised the limitations placed on individuals due to the inherent problems of information and decision-making, post Keynes (1937) and Knight (1921). The attempts of economists to incorporate such elements into the mainstream theory have been gradual, to say the least. The Nobel prizes for economics were awarded to information theorists who developed analysis in the light of such problems in 1996 and 2001 – 60 and 65 years respectively after the publication of Keynes' *General Theory* (1936).

Whilst it is only one of several elements of the decision making process (McFadden, 2001), information is rightly seen as central to the decision making process in economic theory, but the nature of the relationship between 'information' or data in its raw form and the act of decision making is not often elaborated upon. Such information requires a process of search or acquisition. The extent to which individuals will acquire information depends, obviously, on the relative costs of its acquisition and the benefits of possessing it, or more realistically the expected benefits of possessing it. Information search will be conducted, therefore, until 'the cost of search is equated to its expected marginal return' (Stigler, 1961, p.216).

Information search involves communication that often requires effective translation of the information from its original form into one useful for the purpose of those acquiring it. The problems inherent in such a process have led to the development by communications engineers of models that separate the influences on the 'data' transferred, following the work of Shannon & Weaver (1949) and Berlo (1960). The transmission of data with 'fidelity' will depend on obvious technicalities such as the nature of the encoder and decoder used and the channel (or medium) through which it is transferred, terms which have obvious parallels with the human process of communication. In addition to the technical problems, Berlo explicitly examines the factors in human communication, namely the relative social position of the individuals communicating, their attitudes, level of knowledge and specific communication skills. The likelihood of information being accurately transferred is therefore often low, due to the complexity of the task and the influences specified above.

In conceptions of the information society, search is cheap and fast in a rapidly moving informational economy. Here problems will depend more on the capacity of the individual to use, process and communicate information, and the ability to assess and synthesise disparate sources of information. Consequently, the creation of certain knowledge is not necessarily going to become easier as information search becomes easier in the developing information

economy. Information creation, just as its reproduction and transfer, becomes cheaper and easier in the new information system. Disinformation and opinion are therefore as easily spread as true information, and so the overall impact on typical levels of individuals' 'knowledge' is unclear. If good information drives out or beats bad information, then we could expect people to become progressively better informed and more knowledgeable. If, however, the truth does not easily 'win' in the competition against untruths, then it could become lost in the volume of information crowding the media. A parallel may be drawn to the low cost of television programme production and transmission with the development of cable, satellite and digital forms of transmission – these did not necessarily lead to an increase in quality, and might be seen as leading to a fall in quality.

Certain types of information may be more or less valuable depending on the economic circumstances in which they exist. Technical expertise, for example, may be of little use in a primitive economy where no capital goods are available, but are more so in an industrial economy. Arguably these skills are less important in a 'knowledge economy' of the type accompanying the existence of information societies, where 'knowledge workers' are likely to exist using particular types of 'information skills' for 'knowledge work' in 'knowledge industries' (Drucker, 2001). Once many production processes and information gathering processes have been delegated to technology that is self-operating, some form of 'higher order' skills will become the distinguishing characteristics of individual workers.

The current value placed on the possession of information depends upon the scarcity of such information. The fierce debates surrounding Google's 'Google Print' project to digitise volumes from five of the world's leading libraries and make them freely available on the web ([print.google.com](http://print.google.com)) indicate just how valuable information monopolies remain today (Gorman, 2004). These debates also reflect the belief that controlling information enables groups to control the way in which people think. The determination of the French government to provide, with EU support, a French equivalent to this attempt at English domination of the future reflect the importance of information and its control (Bremner, 2005).

So what type of information will remain valuable in the new 'knowledge society'? This appears to be information relating to networks of contacts and connections to the information media, but also information on knowledge 'short-cuts'. Know-what (factual knowledge), and know-why (understanding technical or scientific principles) constitute the basis of knowledge that can be acquired through traditional learning and which underpins industrial economies. Know-how (judgement and skills) and know-who

(social knowledge of experts who can get things done), however, are more difficult to acquire other than by experience and are not traditionally taught forms of knowledge, but are increasingly important in the flexible and rapidly changing economies of the new knowledge society (Information Society Commission, 2002, pp.19-20, from OECD, 1996). Know-who, in particular, becomes important in geographically dispersed production systems working in rapidly changing conditions of a global market. No-one can know everything anymore, or even have time to discover it even in an information society with its vast free information media. It is, however, possible to know a network of contacts who do. The question remains whether even these 'informationally literate' individuals will be able to influence the behaviour of governments, and this aspect of the information society is problematic in light of the analysis of social and institutional economics.

### **Social Networks and Collective Action**

It is assumed that the 'information society' will have beneficial effects at both the individual and the collective level. Free access to information should enable individuals to make 'rational' choices, dismissing unsuccessful strategies and accurately assessing the benefits of positive strategies. In political activity this has been assumed to create an 'open society' as outlined by Popper (1945/2002). It is generally assumed in the public and institutional economics literature, however, that collective political action will depend on the likely extent of networks and institutions. If the costs of constitutional or legal manipulation are lower than those for 'economic' or exchange activities, then groups would pursue their objectives through the alteration of the law as the most efficient method (North, 1971; 1984). Otherwise they would simply participate in market activity to further their self-interest. Olson (1982), using an application of his 'logic of collective action' (Olson, 1965), explicitly analyses the likelihood and possible implications of such collective political activity for economic growth.

Olson (1982) suggests that collective action by interest groups may potentially have positive effects for the society as a whole, but only under certain circumstances. Where an 'encompassing interest' exists, namely where a sufficient proportion of the benefits of any generally beneficial action accrues sufficiently to a particular influential decision maker (or group), that decision maker may find it worthwhile to incur the costs of such action despite the significant positive 'externality' or spillovers created by their actions. Two-party political competitions, for example, where each vies to represent the interests of a majority of the electorate, can create a

sufficient incentive to those interest groups involved in political campaigning to also further the general interest (p.51), assuming that the electorate it represents of the population as a whole. This principle of 'encompassing interest' may explain the existence of 'benign dictatorships' that implement policies to pursue general benefits for the economy and society. The structure of economy and society can therefore be important determinants of economic performance, through the impact on the structure of incentives to initiate networks and collective action in the economy.

Olson's analysis of collective action is inconclusive overall in its implications for economic performance. As in the Old Institutional school, both positive and negative influences are revealed in the analysis of collective action. Negative impacts on performance occur in the presence of collective action by special interest coalitions as 'special-interest organizations redistribute income rather than create it, and in ways that reduce social efficiency and output' (p.47). In addition to such coalitions being more likely to indulge in price or quantity fixing, in industrial groups, they are also less responsive to change than the individual entities which constitute them, restricting the adaptability to changing conditions of those economies dominated by such coalitions. The possibility that ICT developments help businesses form political lobbies or tacitly collusive networks may help restrict the net benefits of an information society, by simultaneously forming a countervailing power to the civil or information society. It is possible, however, that social rather than political activity may predominate, and the growth in analysis of social networks' impacts has focussed on the key concepts of social capital and the civil society, both of which have political and economic implications.

The concept of social capital, which has a long and varied history, is attributed in its modern form to the work of Coleman (1988), who draws a parallel between Becker's (1993) concept of human capital accumulation and similar processes encouraging beneficial (or self interested) social cooperation in networks. Coleman recognises the highly intangible nature of the phenomena, as well as its necessary dependence on trust in the fulfilment of reciprocal obligations that makes it both difficult to identify and fragile.

Coleman states that 'Social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors' (p.S98). He does not consider such capital to be unambiguously beneficial, however, stating that 'A given form of social capital that is valuable in facilitating certain



actions may be useless or even harmful for others.' (p.S98).

Robert Putnam (1995) clarifies the definition of social capital defining it as 'features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit' (p.67), stating that various forms of social capital exist all of which tend to have some association with 'civic engagement and social connectedness' (p.66). The extent of network connection in each society is seen as an important enabling factor in various economic activities, and will arguable be made easier by the increasing access to information and ICT.

The importance of networks appears to depend on their ability to overcome problems of trust and their consequent ability to minimise the costs of transacting, particularly in less institutionally developed economies. The institutional forms of a society, namely organisations and networks will generate 'social capital, in the sense of mutual reciprocity, the resolution of dilemmas of collective action, and the broadening of social identities' (Putnam, 1995, p.76), to different degrees.

Empirical work has also supported the view that associational activity has positive influences on economic performance (Knack & Keefer, 1997). Knack (1999) finds that higher levels of social capital are associated with improved income distribution as well as providing an alternative to legal forms of contract enforcement, reflecting the possible substitution of formal for informal institutions in the fulfilment of essential economic roles. The 'density' of association is one measure of the extent of social capital, and Putnam also emphasises that 'horizontal' ties between groups are more productive than vertical associations in his study of Italian regions (Putnam, 1993). Greif (1994) also refers to the importance of social networks for development, using the expansion of Italian trade in medieval times to illustrate the potential economic benefits of networks. Studies have, however, identified both positive and negative impacts of trust on economic performance and investment in various economies (Zak & Knack, 1998; Kogut & Spicer, 1999).

Networks, trust, and norms of reciprocity are however vulnerable to situations, such as economic transition or other shocks, that might potentially alter aspects of the social structure. This is hopefully compensated by the effects of one particular element of social capital, that of civil society. The concept of 'civil society' is increasingly being referred to in the literature in relation to the process of democratisation that some commentators have observed in Latin America, Southern Europe and more recently the transition countries. Its use has also been increased significantly in the economic literature due

to the position that it is given in the concept of 'social capital' by authors such as Putnam (1995) and those following its work.

Hegel's analysis of civil society described it as a space between the state and the individual, in which association could take place and which might be protected or policed by some form of authority. This suggests an important role for civil society in the determination of associational activity, which constitutes an essential feature of civil society. It is interesting, however, that Hegel's conception of civil society included a role for the state in protecting it or fostering its development, despite the belief in recent times that civil society is either a place free of state interference, or actively opposed to the state (Lewis, 1992). Its very general conception simply as 'a public place or sphere' in fact leaves a range of possible interpretations. Pietrzyk (2003) defines civil society as:

'political, social and civil rights, the rule of law, a public sphere and above all a plurality of associations... and refers to a public space between household and the state, aside from the market, in which citizens may associate for the prosecution of private interest within a framework of law guaranteed by the state' (p.39)

The need for civil society groups as a balance to the power of the state is explicitly recognised by international financial institutions, at the very least, due to their beneficial impact on project performance in developing countries (Pritchett & Kaufmann, 1998). The agencies typically see civil society as an important and separate entity from either the market or commercial sector and the state (UNDP, 1997). The operation of civil society fosters democratic stability in two ways: 'Internally, civic groups inspire habits of cooperation, solidarity, public-spiritedness, and trust. Externally, these networks then aggregate interests and articulate demands to ensure the government's accountability to its citizens.' (Henderson, 2002, p.140 attributed to the work of Putnam, 1993) Civil society and democratisation are seen as jointly essential for the development of a stable system which should foster economic development (Pietrzyk, 2003, p.38). In many respects these characteristics reflect those expected of the open society and information society as originally anticipated by Popper (1945/2002), suggesting that civil society is in fact a form of proto-information society. The evidence to date on the impacts of such informed interest groups in political contests suggests that information society, with its highly informed and rapidly organising individuals, should be even more politically and economically effective.

Finally, institutional economics suggests that the existence of active, well organised social and civil

society groups, and the possession of even full information is insufficient to create the 'rational' society envisioned by Popper. An open society depends fundamentally upon the responsiveness of democratic institutions to the changing, informed opinions of individuals in society. There exists at least one form of 'lock-in' of institutions, that caused by high information costs and consequent decision-making made in possession of incomplete information, which reduces the benefits of attacking 'primary' or fundamental legal and political institutions that are, often by design, extremely difficult and expensive to change. These factors mean, also, that even societies where individuals possess full information and are fully capable of using this optimally will still demonstrate a degree of lock-in of democratic institutions. Whilst these institutions may change, they will do so only gradually due to the 'transactions costs' associated with their change (North, 1971; 1984), and thus it is unlikely that any society is democratically responsive in anything other than a superficial sense. The 'democratic capital' accumulated through the investment of political agents from many previous generations will take a long time to be eroded. Whilst new technology may make new forms of government feasible, this knowledge will take time to be 'embodied' in actual political institutions due to the pre-existence of a significant stock of embedded institutions (see Solow, 1962, on the process of embodiment that converts technological concepts into physical capital).

The degree of responsiveness to change can, however, increase as a step-change under certain conditions. When political entities are formed or renewed, such as in the post-communist states of Central Europe, or where they re-combine, such as in the states of the European Union, a constitutional discontinuity presents itself that permits the creation of more flexible political arrangements than exists in older democracies.

Strangely, the evidence from the democratisation of Central and Eastern Europe (CEE), as discussed by Pietrzyk, contradicts North's pessimism and Putnam's primary hypothesis: in his analysis of American social capital (1995), he suggests that there exists a declining secular trend in association that coincides with the 'modernisation' of the society. Instead scholars analysing the CEE region suggest an active civil society and association, although with obvious variation within the region. American authors also disagree with Putnam's hypothesis. Florida (2002) emphasises that American cities are actively attempting to create an environment that enables free association and creative arts facilities that appeal to the new 'creative class' of young, technologically 'literate', workers whose skills create the highest value in the American and World economies. This rise of

creative activity and interest was anticipated by Naisbitt (1984) who stated that the information society's development would match 'high-tech' with 'high-touch'. As Aburdene (1994) expands, 'to focus exclusively on technology both limits and distorts our vision of the future. To balance all of that high tech we need a lot more "high touch," which is coming in the form of a renaissance in the arts.' (p.13.) According to this view, the expansion of technology may coincide with a simultaneous enhancement of the quality of individual lives through expressive, spiritual and creative development. In this way, network association can develop the individual's psychological need for belonging and association as recognised in level three of Maslow's hierarchical model of personal needs, and in the anthropological work of Robin Dunbar (1993).

### **Evidence on Network Activity and Small Worlds**

Students of economics are frequently criticised for confusing the supply of a product with the demand for it. The 'laws' stated above, or the reliance of stock markets on these for the valuation of networks, is open to a similar criticism in that it confuses the capacity of a network with its utilization. The take-up rates of new products and services cannot be expected to reach their maximum (the point known as market saturation) for some time, as predicted by Vernon's (1966) product life-cycle. Assuming a rapid development of market to near-saturation is dangerous, even for products with clear benefits such as information and communications technology. Even where the benefits are clear, differences in cost relative to typical income levels will create wide variations internationally in the take-up of new products. It is therefore optimistic to value these products using Sarnoff's or Metcalfe's law, as the length of the product life-cycle is unclear.

Apart from the theoretical modelling of networks outlined above, a great deal of attention has been paid to the actual or likely patterns of personal interaction that would, logically, determine the extent of network utilization. The results of these studies have a general significance for the probable, rather than possible development of information society as well as other forms of collective action.

Psychologist Stanley Milgram (1967) studied the 'small worlds' phenomenon which demonstrates itself in the 'coincidental' occurrence of individuals being connected by common acquaintances. According to Milgram's study, this is in fact not unusual. In his experiments individuals were set the challenge to see if they could transfer a package to someone not known to them purely by sending it on to a personal contact closer to the geographical location of

their address, the initial and subsequent recipients being bound by the same conditions. In his study the average length of the 'chain' of acquaintance was just under 6.0, leading to the common use of the phrase 'six degrees of separation' to describe how distant any one individual is from another in the 'world' social network.

Milgram's study, however, had significant limitations which were not initially made clear: in particular the low completion rate of the 'chains' that Milgram started. Subsequent studies demonstrated that these completion rates were influenced strongly by variables such as race, income bracket, social class, etc., suggesting the results to be inaccurate (although some specific group 'scores' were in fact lower than Milgram's '6.0' estimate). Milgram himself recognised that the successful chains were strongly depend-

ent on 'stars' (or 'connectors' in the modern literature) with large personal contact networks who were able to significantly advance the chain. Thus the value or success rate of chains would be expected to depend on the existence of individuals already having a high degree of association for other purposes that could be used for this particular task. The studies were based solely in the U.S., a country long noted for its high degree of association when compared with other countries (de Toqueville, 1984), although this is now thought to be declining (Putnam, 1995 and see Tables 1 & 2). The denseness of 'small worlds' networks, as well as other factors such as levels of generalised trust essential to the operation of markets (North, 1990), would be expected to increase with the typical degree of association in a country.

**Table 1: Active Group Membership**

|                      | Active <sup>1</sup> | Non-active | Non-member | Proportion active:nonactive (%) |
|----------------------|---------------------|------------|------------|---------------------------------|
| Arts                 | 6.72                | 8.88       | 84.36      | 75.69                           |
| Charity              | 5.27                | 6.64       | 88.05      | 79.38                           |
| Church               | 12.73               | 15.15      | 72.09      | 84.04                           |
| Environmental groups | 2.54                | 6.69       | 90.77      | 37.96                           |
| Other                | 4.52                | 6.31       | 88.86      | 71.60                           |
| Parties              | 3.93                | 8.48       | 87.55      | 46.40                           |
| Professional         | 4.37                | 8.05       | 87.52      | 54.35                           |
| Sports               | 10.52               | 12.54      | 76.91      | 83.93                           |
| Unions               | 4.19                | 17.08      | 78.70      | 24.52                           |
| Total                | 6.01                | 10.01      | 83.92      | 60.01                           |

<sup>1</sup> World Values Survey, all waves, all sample.

Despite the deterioration of the degree of association in the U.S. since Milgram's initial study, attempts to replicate the 'small worlds' experiment have in fact shown relatively similar results, with between five and eight 'degrees of separation' being suggested (see for instance Newman, 2001). Attempts have also been made to apply the small worlds model to other phenomena which have produced interesting results. Watts & Strogatz (1998) suggest that a small worlds 'model' exists which applies to wide range of phenomena including economic activity, and the activity of biological organisms. This obviously has great value in modelling the spread of disease such as during the SARS epidemic. Practical research into real world networks, however, seems to suggest that Watts and Strogatz only present an inadequate account of the phenomena. Albert & Barabási (2002) suggest that, whilst the reliance on 'super-nodes' or 'hubs' equivalent to the 'stars' or 'connectors' revealed in Milgram's original work could explain the

small worlds phenomena, when examined real world ICT networks in fact demonstrate a relatively low occurrence of such 'super-nodes', with relatively similar and poorly-connected or distantly connected 'nodes' being the norm. Milgram's research therefore remains controversial and overall inconclusive.

The analysis of 'ties' has produced such counter-intuitive results before. Granovetter (1973) suggested that 'weak ties' in groups are more valuable to individuals than such strong ties as occur within family groups. The wider coverage of a network of weak or distant ties provides obvious advantages to each member. The relatively open or heterogeneous membership of such groups is identified by Putnam (1995) as a characteristic of economically successful regions, whilst alternative 'closed' forms of group with more homogeneous membership have fewer economic benefits for the community as a whole, and it is hypothesized that such forms of association may actually have a damaging impact overall on the

development of trust, interaction and economic activity in societies, although the evidence on this remains unclear (Knack & Keefer, 1997; Knack, 1999). Milgram's own work suggested more insular groups to have variable scores on the 'degrees of separation' test, with some relatively closed communities performing poorly. Certainly this is what economic theorists have predicted. Weak ties in dispersed networks are seen, overall, as the 'best type'.

It is still possible, though, that Granovetter's (1973) conclusion is consistent with small worlds networks. Milgram's initial studies showed how connections are stretched across significant distances, suggesting that effective chains or networks had the characteristic of being geographically dispersed. Whether the ties within these chains were based on closed or open forms of association remains unclear.

**Table 2: Declining Trust (Generalised Trust i.e. in Strangers)**

| Area <sup>1</sup>           | Country & date | % trusting | % careful |
|-----------------------------|----------------|------------|-----------|
| All World Values Survey     | 1981           | 38.45      | 61.55     |
|                             | 1990           | 34.61      | 65.39     |
|                             | 1995-97        | 24.35      | 72.46     |
| <b>Developed Countries</b>  |                |            |           |
| North America               | USA 81         | 40.50      | 59.50     |
|                             | USA 90         | 51.07      | 48.93     |
|                             | USA 95         | 35.94      | 64.06     |
| Britain                     | Britain 81     | 43.28      | 56.72     |
|                             | Britain 90     | 43.68      | 56.32     |
|                             | Britain 98     | 29.09      | 69.08     |
| Scandinavia                 | Finland 81     | 57.17      | 42.83     |
|                             | Finland 90     | 62.72      | 37.28     |
|                             | Finland 96     | 47.92      | 50.25     |
| Europe – declining          | Spain 81       | 35.14      | 64.86     |
|                             | Spain 90       | 34.24      | 65.76     |
|                             | Spain 96       | 28.65      | 67.71     |
| Europe – rising             | W Germany 81   | 32.29      | 67.71     |
|                             | W Germany 90   | 37.86      | 62.14     |
|                             | W Germany 97   | 39.92      | 55.65     |
| <b>Developing Countries</b> |                |            |           |
| Mid/South America           | Mexico 81      | 17.49      | 82.51     |
|                             | Mexico 90      | 33.45      | 66.55     |
|                             | Mexico 96      | 26.42      | 67.62     |
| Africa                      | S Africa 81    | 29.03      | 70.97     |
|                             | S Africa 90    | 29.14      | 70.86     |
|                             | S Africa 95    | 15.37      | 81.57     |
|                             | Nigeria 90     | 23.21      | 76.79     |
|                             | Nigeria 95     | 19.20      | 80.80     |
| Asia                        | India 90       | 35.43      | 64.57     |
|                             | India 96       | 32.84      | 53.87     |

<sup>1</sup> World Values Survey

The alternative, pessimistic hypothesis that individuals are not in fact highly connected, however, has worrying implications for those advocating the development of ICT initiatives for information society such as those mentioned above (Moodley, 2005) if it is true. Unfortunately it has received scientific support as shown by the recent interest in the ‘Dunbar number’. The limit expected on the development of networks of meaningful and maintained relationships is now often assumed to be the ‘Dunbar number’ of 150, a figure which is arrived at by examination of the typical group sizes of primates in relation to brain size. Dunbar (1993) estimates that a typical upper limit on groups size of 150 is likely in humans from this research, due to the necessary ‘social grooming’ that is required to maintain active connections in a social network. Even though humans have developed language skills that may offer ‘economies of scale’ in such grooming, it is a burden on our resources to maintain large social groups. In addition the disruption of social groups consequent on the development of the modern lifestyle may act to make such connections more difficult to maintain. The World Values Survey has certainly demonstrated declining levels of both group membership and trust over the period of its existence.

In addition, Fehr and Fischbacher (2003), using experimental data from economic simulations, support these pessimistic estimates suggesting that issues of trust and commitment enforcement may be key to the low group membership tendency in humans, again supporting the idea that there is in practice a relatively low ceiling on network extent under particular institutions or incentive structures. Even in leisure activities, where we might assume such enforcement issues were less vital, group membership appears typically limited.

Should we be surprised by these thin networks in the new network age? Not if we consider earlier discussion of social networks. Whilst the ‘net’ imagery often leads to a concentration on the connectedness of individuals, the dominant characteristic of a network is its ‘holes’, with connections only needing to be sufficient to the task. As White et al. (1976) state:

‘The essential phenomenon portrayed in network imagery, we argue, is the absence of connections between named individuals. The logical symmetry between ties that are “present” and ties that are “absent” (i.e., all others) has encouraged [analysts] to overlook the social asymmetry that exists between social action and its complement [inaction].’ (p.731-2.)

Sociologists have, it appears, been aware for some time of the inaction of individuals in society. Network analysis needs to be based on a realistic view

of networks – that they exist in the midst of a much more significant *lack* of connection. For society to become more connected, and for network images to become representative of real-world interaction, fundamental changes must first occur.

### Conclusion: Network Economy or Information Society?

Overall the optimistic predictions for ‘digital society’ appear to be difficult to maintain in the face of both theoretical analysis and also emerging evidence on association. Whilst the growth of ICT has surely made the idea of the ‘knowledge economy’ relevant to everyone, it remains unclear whether an information society capable of helping well informed individuals hold governments to account for their policies will result from this technological development. Whilst it is possible to say with some degree of assurance that ICT constitutes a new and significant form of information media, we cannot be sure that the wealth of information that it provides will be of a higher quality than previous forms from media with their own inherent institutions and biases. Further, it is uncertain whether individuals will benefit in terms of knowledge, rather than data, from this development as the creation of knowledge is a related but separate process from that of data creation. These two factors require a more realistic interpretation of information society’s prospective development.

Economic theory and economic sociology have also suggested problems for the development of an effective information society. Even assuming individuals are well informed on political issues and understand the personal impact of such policies, collective action will be constrained in terms of both its likelihood, due to the relative costs of such action in relation to the share of any benefits accrued (Olson, 1982), and in terms of its effectiveness due to the existing nature of restrictive institutions surrounding the legal and political framework (North, 1971; 1984). The difficulties relating to the creation and maintenance of any association or group in terms of the problems of trust and enforcement (Fehr & Fischbacher, 2003) and the problems of the high cost of effort involved in ‘grooming’ fellow group members (Dunbar, 1993) suggest that the maintenance of group membership may be unlikely. Despite the evidence of Milgram (1967), it probably isn’t an entirely small world, and the rise of the ‘super-node’ social connector appears to be a slow one, if it is occurring at all. In light of this, early assumptions that the growth of digital society (and the consequent economic infrastructure) would be meteoric, based on Metcalfe’s and Sarnoff’s laws, appear misguided.

Despite all this theoretical and empirical evidence on the subject, it still appears to be controversial.

The falling cost of information and increasing speed of accessibility must, it intuitively appears, have significant impacts on economic, political and social lives. Whether this leads to informed but uninvolved isolation, or active participation remains to be seen, but these option will soon be cheaply available if people are inclined to this behaviour. Whether the

development of a digital age with advanced ICT infrastructure might actually help reverse the declining trend in association, by making association easier to fit in with modern, flexible and rapidly adapting lifestyles, remains to be seen. The development of the network economy may or may not be accompanied by the rise of an information society.

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