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ICTs and Dematerialisation: Some implications for Status Differentiation in Advanced Market Societies

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ICTs and Dematerialisation: Some Implications for Status Differentiation in Advanced Market Societies

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This paper is primarily concerned with a theoretical discussion of how new markers of social status are beginning to emerge from differences in people's access to information and communication technologies. It also addresses various social distinctions that digital technologies are thought to generate and exacerbate. It posits that the current emphasis on economic activity that is ICT intensive produces a bias towards 'dematerialisation' and the valorisation of dematerialised activity. It further posits that this bias will both 'intermediate and redimension' community perceptions of social status and prestige. Drawing parallels to the industrial era where transportation technologies (cars, trains, boats and planes) shaped and conditioned a hierarchy of status symbols, the paper argues that ICTs are now beginning to dynamically intermediate in symbolic processes that 1) define and allocate social status and social honour; 2) define and mark social inclusion and exclusion; and 3) shape community defined prestige hierarchies.

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1. Introduction

Leading observers of global developments in ICTs[i] as well as scholars of the economics of industrial innovation, routinely point to *the economic and social divides* that digital technologies are thought to generate and exacerbate.[ii] The main commentary, and particularly that commentary relevant to policy makers, tends to be about 'access' to information and communication technology (ICT): who has it and who does not.

Discussions of access to new technologies tend to focus on internal dynamics and capabilities of societies, at the individual, institutional or infrastructure level. However, the potential reach of access issues is far greater. Certainly it already includes relations of relative advantage and disadvantage between large transnational agents such as corporations. As new research is beginning to show, it also involves relations between societies, and for that matter even whole continents, and is therefore of more than passing interest to international governance entities (Mansell and Wehn, 1998).[iii]

Reflecting his abiding interest in human development issues, Chris Freeman, and his colleague Luc Soete (1997), recently observed:[iv]

> The advent of the information society has thus been accompanied by a reversal of all those trends toward social justice and improved welfare services, which were such a characteristic feature of the quarter century following the Second World War. It seems probable that some features of the information society will exacerbate these trends even further. In particular a division is taking place between the 'information rich' and the 'information poor'. A fairly large number of people, even in the richest countries, are unable or unwilling to use the new technologies or to gain access to facilities where they might be used. 'Information poverty' corresponds fairly closely to material (income) poverty but is not identical. However, it can easily lead to material poverty in the labour market conditions generally prevailing. Social exclusion and the growth of a large underclass are thus becoming characteristic features of the information society, reinforced by the decline of the welfare state and the growth of regressive taxation. (Freeman and Soete, 1997: 410)

These deeper implications about what is evolving have occupied the attention of some of the world's leading experts. At the OECD (1991) various publications outlining the interaction of technologies and economies led the Secretary-General in 1993 to describe the trends as 'disturbing and alarming'. Martin Bangemann (1994) was given a remit, as was the High Level Experts' Group (1996), to probe and to devise ways to adjust and potentially to pay for what is seen as a widening gulf of social inequality both within and between countries.

When we actually examine debates about access, what surfaces quickly is the difficulty of providing any clear definition. What exactly is it that some (possibly the privileged) are said to have advantageous access to? Conversely, what exactly is it that others want (or should be able) to gain access to? Is it access to hardware; to silicon chip technology, personal computers and modems, and new communication devices such as cell phones, pagers and satellite TV? Or is it access to the information they carry; the knowledge (and also the entertainment) that courses about as an endless bitstream flows through various conduits? Or is it access to digital networks and connections that ICTs enable; the ability to be plugged in and 'wired' to something semi-mysterious, but still human.[v] Quite routinely, 'access' refers to all of these things, and many more besides.

Policy commentary and debate on access, albeit largely in the absence of a workable definition, is an important sign or indicator. It is a visible expression of concern and unease about the deep processes of economic and social change. If the experts are to be believed, then ICTs are gradually shifting the economic and social platforms that carried the industrial order for several decades, and with it the international order.

Prior to these shifts, both social researchers and citizens living in market societies had a reasonably clear picture of the main dimensions of social privilege, and of their inverse, social inequality. Knowledge of a person's occupation, gender, ethnicity, as well as various well-ordered perceptions attached to the ownership of specific types of property and styles of conspicuous consumption, pinned most people to a spot somewhere on the map of ranked social status.

The nagging feature that accompanies so many changes signalled by ICT growth and use is that the comforting status map that gave hierarchical meaning and order to life in market societies may now be incomplete. A suspicion lurks that the internal status maps we carry within us may require *re-dimensioning*. Or even more fundamentally, these maps may no longer usefully fit emerging and shared perceptions of what is central, important and socially valued. The ever-shifting sense of where 'it' is, or where 'it' is going, has taken on enhanced meaning.

At any given time, relocating new points of social signification frequently requires attention to the intermediating role of ubiquitous technologies. In the post-war industrial and highly materialised market societies, automobiles, and other forms of vehicular transportation such as trains and aeroplanes, configured and consolidated a sense of people's social positions. Similarly, now that ICTs are looming, *their particular forms of intermediation appear to have the potential to reframe portions of the internal maps we carry around concerning who and what is deemed important.* The hypothesis is that the types and levels of access to ICTs are subtly redefining basic perceptions of social status and dimensions of inequality. If this is so, this renders the access issue something more than just another piece of 'pop-culture' change and adjustment.

Mansell and Silverstone (1996) reflect on the potential societal level effects of ICT intermediation in a series of telling comments.

> While societies as a whole become progressively more dependent on electronic media and information and communication services, then those who find access, for financial or other reasons, increasingly difficult or just simply impossible will become progressively marginalised and excluded. Isolation can take many forms. In an information age, where technologies themselves are reasonably seen as the instruments of social and economic inclusion, then non-participation in a culture defined and articulated through electronic networks of one kind or another will have profound cultural as well as political and economic consequences.
>
> (Mansell and Silverstone, 1996: 224)

The intention in writing this paper is to explore and analyse selected aspects of one large but pressing question. In the advanced market societies, is the deployment and use of ICTs simultaneously creating new patterns of social inclusion and exclusion by shifting the lines and dimensions (both material and perceptual) that divide the 'haves' from the 'have nots'?

This question is a sensitising device. Even a partial answer would require a research programme involving many steps and research activities over a sustained period. This working paper is only a first step.

One feature of this larger question is isolated here for immediate attention. The question is recast into a series of questions. Do ICTs dynamically *intermediate* within social processes that: a) define and allocate social status and social honour; b) define and mark social inclusion and exclusion; and c) shape community (such as occupational community) prestige hierarchies? Through examination of this series of questions, we may discover a few things about the larger whole.

In recasting the question, attention turns *to potential intermediations of technology in community-defined perceptions of social status*. This limits the inquiry to a particular dimension of social inequality; specifically, within group perceptions of status honour and ranking. How, for example,

does evidence of skilled interaction with new technologies fold into social perceptions; are those who are skilled at computer mediated forms of communication becoming a highly differentiated and segregated social stratum?

Additionally, since ICTs refer to a very broad and heterogeneous array of technologies and services, a further narrowing of our inquiry is required. We have selected the Internet as a prototypical ICT intermediating technology. Examining the Internet as an exemplar or proxy is likely to tell us something about the surface (and observable) aspects of Internet intermediation and the deeper, and more general inclusionary and exclusionary factors of access that seem to permeate the wide range of ICTs.

Three main themes are discussed initially to set up later sections of this working paper. The *first theme* reviews implications of *processes of dematerialisation* for a contemporary re-ordering of values and symbols that underpin shared perceptions of status ranking. The term 'processes of dematerialisation' refers to certain macro-level views that posit a shift from an economy based on atoms to an economy based on bits, that is, from an economy which socially values material production and commodity outputs to one that emphasises bitstreams and replicable knowledge as the preferential sites of production and consumption.

The *second theme* highlights theories that posit that successive waves of techno-economic paradigms (TEPs) and *institutional mismatches* arise when one technological regime is being replaced by another. These institutional mismatches are said to illustrate 'meso-level' gaps and lags where institutional structuring must re-synchronise with other material economic developments, and where perceptions and beliefs must undergo re-coordination.

The *third theme* concerns *status markers* and *status differentiators*. These terms are employed notionally to capture two important elements in the social construction of status orders. Status markers refer to specific, real and observable identifiers of both a physically and socially imputed character. Status differentiators refer to transactional processes that catalyse, embed and inscribe status markers as distinctions of 'difference'. Differentiators, when they become regularised, generally crystallise into institutional norms and rules. Both involve aspects of what are more or less continuously negotiated community perceptions through which social status and ranking are assembled and reinforced.

The three themes address different levels in the analysis of technical and institutional change. Dematerialisation processes offer a macro-level heuristic tool; they figure the canvas in very broad and tentative brush strokes. The TEP perspective shades in the figures by highlighting implications for the meso-level; that is to say, it points to implications for institutions. Status markers are 'spray-bombs' operating in the street; they wash colour into the picture through interpersonal micro-level encounters. Status differentiators, as replicable processes, link the micro-level and the meso or institutional levels. A fully rounded picture of status processes requires some attention to all three levels.[vi]

A review of these themes leads to an examination of empirical correlates of actual users who access the Internet. These access stylisations point to certain status group characteristics of typical Internet users, albeit at this point, using only demographic markers. We then examine the validity of the widely used metaphor of the 'Internet as a frontier'. Comparisons are made with well-documented social features of geographic frontiers to see if the metaphor fits. This analysis provides a basis for examining certain dynamic tensions such as the notion that the Internet is widely thought of as a lateral levelling device and is therefore ultimately likely to be highly egalitarian. This perception is not sustained by current Internet user profiles and is also subverted by the still-overwhelming commitment to computer mediated forms of communication (CMC) that Internet access requires.

The implications of Internet access patterns for social closure and exclusiveness are then summarised. The concept of 'status estate' is introduced to gauge its applicability to patterns of computer mediated

communication and related ICT activity at the inner core of net life and culture. A preliminary typology of key elements of (Internet) access that **potentially** act as status markers and process differentiators is derived. Some specification follows of how this typology could be further developed in observational settings and by using behavioural and attitudinal measures. The paper concludes by returning to the policy implications for the skills and competencies needed to access the panoply of ICTs.

2. What is Dematerialisation?

The concept of *dematerialisation* is used here as a heuristic tool. Its origins lie in the literature on industrial ecology that discusses the interaction of technology and the environment. In that tradition the concept has been used to refer to the *inverse* of materialising processes whereby societies increase their inputs (and outputs) of raw materials, commodities, and things. Dematerialising processes are the means whereby economies and societies might be said to 'lighten up' (Herman *et. al.*, 1989 and Wernick *et al,*. 1996).[vii]

In this paper, the use of the term *processes of dematerialisation* differs from its original intent. It is used here to characterise macro-level processes involving posited shifts in economy and society. Processes of dematerialisation are discussed to capture a range of macro-level changes.[viii] The term characterises arguments that suggest that the main axis of economic value is shifting towards the increased valorisation of weightless configurations of bits as distinct from, and contrasted to, configurations of material atoms.[ix]

The dematerialisation argument is most baldly put by Nicholas Negroponte in *'Being Digital'* (Negroponte 1995). Negroponte, by virtue of his position as head of the MIT Media Lab, is particularly well placed to comment on ICT trends and foreshadowings. With characteristic aplomb, he describes the shift in the balance between matter and information as the shift from 'atoms to bits'. Negroponte contends that we are witnessing a redefinition of economic value, commerce and work wherein bits (or information content) are gradually becoming more valued than atoms (or material forms). Negroponte notes:

> The information super highway is about the global movement of weightless bits at the speed of light. As one industry after another looks at itself in the mirror and asks about its future in a digital world, that future is driven almost 100 percent by the ability of that company's product or services to be rendered in digital form.
> (Negroponte, 1995:12)

This is, of course, hyperbole; since cars and catfish and cantaloupes will be needed for many decades and they are not likely to be rendered digital. What seems to be occurring though is that for every object or service we develop or use, the information density and knowledge inherent in it is rising. This interpretation is crude, but it does have some explanatory power. One has only to compare, for instance, the rebalancing of matter and (design) information by thinking about the differences between a 1956 Cadillac and a 1997 Lexus. The Cadillac was almost all physical matter and little thought, while the Lexus is quite the reverse.

Other contributions to the literature inscribing dematerialisation are more nuanced and restrained. In particular there is the work of Danny Quah who applies the concept of dematerialisation to specific purpose, and the work of Manuel Castells who discusses similar processes using different terminology.

2.1 'Twin Peaks' Dynamics

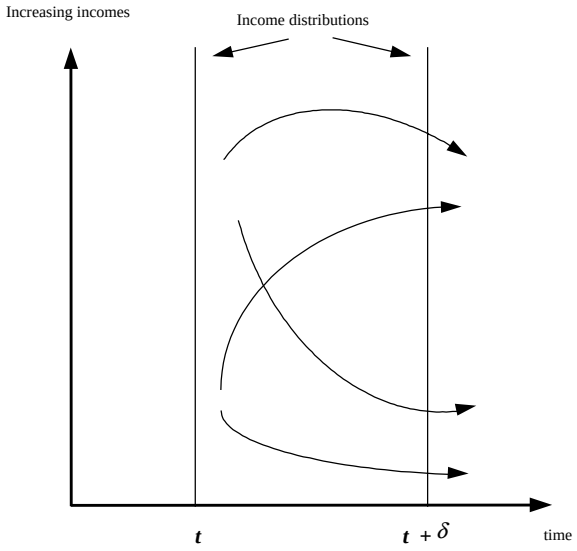
In a series of papers by Danny Quah (see especially 1996), we find an economist who makes the dematerialisation concept central to his work and applies it with subtlety. For Quah, a dematerialised economy represents an extreme polarity, where infinitely replicable commodities, such as the bits and bytes congealed in software or gene sequence codes, become the stock of trade. He contrasts this with its opposite, the materialised polarity, where atoms and molecules hold sway, such as in transportation devices (cars, airplanes, or supertankers) and urban office towers.

Neither polarity exists at present, at least in the advanced industrialised economies, in a pure form. There are always degrees and blends and valences. Nevertheless, he thinks there is evidence that the dematerialised polarity is growing, and he points to US exports and high quality job creation in those sectors which fall into the 'dematerialised zone' as indicative.

He also posits that dematerialised economies are different; that they display different macro-level dynamics. One important dynamic involves income polarities, for which he has derived cross-national empirical trends (Quah, 1993). Figure 1 reproduces the basic shape of what he calls a 'twin peaks' dynamics model, where the income middle is clearly being squeezed. In the twin peaks profile, there is more convergence within the high and low ends. He also conjectures that twin peak dynamics produce more fluctuations and greater social mobility and circulation upwards and downwards. Thus, he is suggesting that dematerialising processes increase meritocratic circulation, but that they also enhance social closure at the high and low ends while hollowing out the middle.

Another feature of this work involves the extension of the concept of infinite expansibility from endogenous growth theory.[x] What makes dematerialised economies different is that their commodities and products, usually bit-based or codified idea and knowledge-based, can be replicated infinitely with no detraction from other users. This is unlike traditional materialised consumption where the gain and use of a commodity by one person is at the expense and loss of another. Therefore, infinite expansibility challenges the role and perception of scarcity. Insofar as ideas and knowledge come to be expansible, and insofar as idea networks are treated as expansive stocks, the economic system opens to the possibility that everyone plugged in and contributing to various bitstreams has the potential to add value. No longer is it only the inventors and scientists as in earlier R&D and innovation systems models.[xi]

Figure 1: Twin Peak Income Dynamics



Source: Quah (1996).

Quah refers to this process as the growing 'weightlessness of GNP' and implies that national accounts and trade statistics are way off the mark. However, it is the implications of his model and his speculations on social stratification that are of interest in examining macro-level shifts that have micro and meso-level implications. For instance he notes:

> Models being investigated are still abstract and highly stylised but the preliminary findings are intriguing. In some of these models, subgroups in societies form knowledge-based coalitions; a class (sic) structure endogenously emerges. Over time, small differences across social groups magnify. Depending on initial circumstances, patterns of polarisation and stratification appear.
> (Quah, 1996: 9)

One pronounced effect that he traces is the emergence of 'superstar economies', derived from the work of Frank and Cook (1995). He notes that in specific economic areas, such as entertainment and sports, the product (think here of a major event), is infinitely expansible through the connectivity of digital communication systems and through physical replication of things like video-tapes.[xii] Since infinite (or near infinite) expansibility is possible, the desire (and demand) to consume the output (performances) of the very best superstar performers is huge. The ability of one or two top stars to charge large fee differentials over those considered 'next best' is the net result. Performance fees become astronomical for the highly talented few. As for the many, they strive to join (and knock out) the few, which is why Quah believes that circulation and mobility functions will become more pronounced.

Quah's articulation of dematerialised and materialised polarities only lightly refers to debates about the role of knowledge in economic activity. For instance, he refers to the distinction between disembodied technical change (ideas that lead to entirely new things) and embodied technical change (ideas that lead to improvements in existing things).[xiii] Quah focuses instead on macro-level dynamics of which income dynamics are the most amenable to empirical scrutiny.

2.2 Dualism and the Information Mode of Development

The work of Manuel Castells has also explored aspects of dematerialisation processes over the past decade but without labelling them as such. It is perhaps Castells' background in urban geography which has made him so attentive to macro-level structural change. The benefit of this, is that his recent work places him in the front rank of social theorists who seek to understand the main forces of their times.[xiv]

Castells offers a macro-structural diagnosis of the changing form of capitalist production. He contends that a new model of socio-economic organisation has emerged in the period following the oil shocks of the 1970s. This new mode of capitalist development, which he terms *the informational mode of development* (or informationalism), characterises the international system of the late 1980s and the 1990s. He argues that it has replaced the Keynesian welfare-industrial state model of the period 1945 to 1975. Castells keeps square to his structural neo-Marxist origins by providing a distinction between the dominant mode of production (still capitalism) and changing modes of development within the dominant mode of production.[xv]

This, Castells contends, involves restructuring. Within what he calls informationalism or the informational mode of development there is also increased emphasis on the 'technological' and the 'organisational'. Increased emphasis on the 'technological' refers to increased use of new information and communication technologies (ICTs). Castells contends that ICTs increase the rate of profit; support the domination and accumulation functions of the state; and allow for the internationalisation of the economy.

As for new organisational features, Castells isolates the following; increased concentration of knowledge generation and decision making processes in high level organisations; increased *flexibility* of organisational systems and units; and a shift from large centralised corporations to decentralised networks of organisational units.

This macro-structural analysis and the role that new ICTs play in a 'global logic' is summarised:

> New information technologies are not in themselves the source of the organisational logic that is transforming the social meaning of space: they are, however, the fundamental instrument that allows this logic to embody itself in historical actuality. Information technologies could be used, and can be used, in the pursuit of different social and functional goals, because what they offer, fundamentally, is flexibility. However, their use currently is determined by the process of the socio-economic restructuring of capitalism, and they constitute the indispensable material basis for the fulfillment of this process.
> (Castells, 1989: 348)

Being concerned with spatial relations, Castells marshalls evidence to demonstrate that there now exists a 'dual city'; one aspect of the duality is rooted in the Keynesian industrial-welfare mode, and the other is rooted in the new informational mode. The dual city thesis begins with differences in the spatial division of labour between ICT manufacturing and traditional manufacturing. In ICT industries there is 'a distinctly polarised occupational structure, with a high proportion of engineers, scientists, and technicians, a sizeable proportion of unskilled workers, and a relatively small number of skilled manual workers, in opposition to the pyramidal structure of occupations in traditional manufacturing' (Castells, 1989: 76).

This polarisation, he suggests, also reflects divisions of gender and ethnicity, with women and minorities over-represented in the unskilled jobs. The sharp internal occupational differentiation is also accompanied by a sharp geo-spatial pattern, since higher level functions and personnel in high-tech industries tend to be concentrated in segregated privileged spatial locations. The unskilled are scattered over more and varied locations, leading to locational sprawl in high-tech manufacturing.

Under this model, there is not only a dual city but a duality to the whole economy (primarily, in this case, the US economy), with a declining base of traditional manufacturing and its corresponding spatial relations. Overlaid on this is a new occupational differentiation and spatial order rooted in the informational mode. He notes:

> It is my hypothesis that the main reason for the current transformation of the occupational structure lies in the old industrial forms and activities, and the subsequent creation of new ones, under the powerful impetus of a new, technology led round of economic growth.
> (Castells, 1989: 188)

Castells reviews estimates of the growth of information work by Marc Porat and others. This reinforces his view that present-day advanced industrialised economies are not post-industrial at all, rather they are informational. That is to say, 'the production of surplus derives mainly from the generation of knowledge and the processing of necessary information' (Castells, 1989: 136).

Castells situates the motor of the informational mode in large-scale organisations, be they private corporations or public bureaucracies. He argues that the internal and external linkages of large organisations are being expanded at a dramatic rate. He contends that ICTs are not creating indiscriminate unemployment, but rather they enable a selective re-defining of occupational positions and labour characteristics. Low skilled jobs in manufacturing and services are being eliminated, but re-skilling is also happening for those with the educational qualifications to respond. Thus, he believes that the restructuring of labour is profoundly affecting the social stratification system and that this is evidenced by recent trends in income distribution (Castells, 1989:197).

Castells offers evidence of the polarisation of incomes and the decline of the middle class but only with reference to the United States.[xvi] In essence, he asserts that major job growth has only been seen in the lowest wage sectors, often in flexible and part-time work and in down-graded full time jobs. Despite the off-setting factor of many families with two wage-earners, there has been a shrinking proportion of middle-income households in the overall distribution. His analysis of income dynamics and polarisation echoes the twin peaks distribution dynamics hypothesis plotted by Danny Quah and converges with it with considerable symmetry.[xvii]

After discussing the urban cases of New York and Los Angeles, Castells posits that the new form of urban dualism on the rise is linked to the restructuring process and to the expansion of the informational economy which must coexist with a declining traditional industrial economy.

> The differential reassignment of labour in the process of simultaneous growth and decline results in a sharply stratified, segmented social structure that differentiates between upgraded labour, downgraded labour, and excluded people. Dualism refers here both to the contradictory dynamics of growth and decline, and to the polarising and exclusionary effects of these dynamics.
> (Castells, 1989: 225)

Castells introduces a new concept for understanding spatial form and logic, called *the space of flows*, as distinct from the 'space of places'. He argues that the overall corporate logic of large and complex organisations follows a specific 'space of flows' pattern (Castells, 1989: 348-9).

Castells contends that, while production units of the overall corporation are found in specific locations and places, the organisational logic that imperatively coordinates their activity is placeless, and is fundamentally dependent on the space of flows that characterise information networks. In addition, the 'space of places' is increasingly being subordinated to the 'space of flows', as the fundamental spatial dimension of large-scale information intensive organisational complexes. Executive lounges in international airports are prime examples of passage points in the space of flows.

Castells' work hovers around questions of macro-level dynamics and the arguments often land in similar territory to that covered by Quah. Castells offers more detail on institutional and labour force features and implications, but is very much attracted to a polarisation model. With the concept of 'space of flows', he moves us into considerations of new structures and life-styles and of shifting status group interactions and perceptions. The validity of the concept of space of flows, which ultimately rests on the 'placeless logic' of global information networks, stands independently of a resolution on the debate about labour market polarisation. His analysis points to two co-existing economic modes of production, the industrial-welfare mode and the informational mode. This dualism is examined further in the next section.

3. Institutional Mismatch

A substantial body of theory has been built up that looks at shifts in the dominant paradigm under which market societies labour and function. This work points to gaps and mismatches in institutional development. Two streams are identifiable: theories associated with trajectories and techno-economic paradigms, and those on the information society. Both streams have commented on the underlying processes of dematerialisation, although they have not explicitly using this vocabulary, and each has commented on the meso or institutional level of social and economic change.

3.1 Techno-economic Paradigms

Carlota Perez has articulated her profound understanding of the intersecting arcs of economic and social change through the concept of techno-economic paradigms (TEPs).[xviii] This has found further support and voice in her collaboration with Chris Freeman leading to a full scale neo-Schumpeterian derived model of the interaction of technical systems, economy and society.

The emphasis they place on the **interdependence** of technical developments and human beliefs is important. In their model, each successive techno-economic paradigm requires many decades of gestation, and involves massive numbers of small experiments (both successes and failures) while building a base camp of advocates. It is only after a long process of evolutionary selection and reinforcement that a new techno-economic paradigm arises and matures to become a dominant technological regime in which its inevitable application (to almost everything) becomes accepted as common sense.

The newest techno-economic paradigm that began to gather force in the 1970s, involves the widespread deployment and use of ICTs and the ascendance of micro-electronic chip technology to a position as the dominant or *key factor* in economic development of many advanced societies (Perez, 1985: 444). This ascendance and replacement of what came before involves the slow construction of a new dominant technological regime and significant changes in the socio-cultural and institutional spheres that *simultaneously interpenetrate and interact* with changes in the economic sphere.

This sophisticated position stands apart from a crude technological determinism and even the 'atoms to bits' metaphor cited earlier. It is not technology *per se* that is responsible for a shift in the techno-economic paradigm, but rather it is the complex interaction between emerging technical forms and human beliefs, perceptions and choices. When taken together, these comprise a techno-economic paradigm.

The transition from one techno-economic paradigm to another involves a material dimension. This might be termed by neo-Marxists as a change in the forces of production and it embraces a range of socio-cultural and institutional dimensions. By way of example, Perez suggests that the long economic wave of post World War II stability and its correspondent industrial development and growth was largely a result of cheap energy and more specifically cheap oil. This forty year stretch (until the oil shocks of the early 1970s) was matched in the socio-cultural sphere by a relatively good

fit between institutions such as education and civil society, and was accompanied by a management perspective based on Taylorism and the evolution of huge integrated corporations and conglomerates. A division of labour identified professionals and white (middle-class) and blue collar work. Taken together, this constituted a reasonably good match between economy and society in the post-War techno-economic paradigm.

The ascendant ICT paradigm, comprised of cheap micro-circuits, their linkage into communication networks, and their fuelling up with bitstreams of data, information and knowledge, changed the game for ever. However, the selection and ascendance, during the 1970s and 1980s, of these new factors of production, did not happen overnight. Their very technical possibility was preceded by basic semi-conductor developments and then integrated circuit designs, all the while paralleled by the growth and development of digital processing capabilities.

The new digital-chip paradigm received a major boost as a result of massive drops in prices of both chips and embedded information and the explosive global growth in digital information and communication networks. The result is now widely perceived as a significant comparative advantage offered by shifting from a paradigm based on cheap oil and the movement of things, to cheap chips and the movement of bits and information.

As these ‘factor advantages’ take hold of the imaginations of entrepreneurs, managers and engineers, they also begin to grip the collective economic psyche and invade popular consciousness. Of necessity, it too must become refracted in shifting perceptions of the status order creating a different sense of who and what ultimately counts; of who are the drivers and who are the driven.

Let us remember that all technologies are humanly constructed embodiments. They are not material or technical determinations, despite the seeming everlasting wish to attribute to them independent ‘force’. As Mansell (1994) has pointed out the ICT revolution is very much based on human agency; on choices, design decisions, and the construction of perceptions and values, but always within certain constraining structures. These constraining structures are often expressed in traditions of ‘practices’ that belong to communities of technological practitioners such as within sub-communities of engineers and designers (Archambault, 1996). Routine practice, or common sense, rests on ‘dispositions’ of both humans and organisations, and these cluster to form what Bourdieu (1977) terms a ‘habitus’. The habitus typically inclines agents to act and react in certain patterned and semi-predictable ways.

It is therefore useful to consider carefully the Perez and Freeman distinction between a techno-economic paradigm and a ‘dominant technological regime’ where accepted practice becomes perhaps over-determinant. Perez and Freeman suggest that there are periods of discord, mismatch and disconnect between the ascendance of a new paradigm and its full societal and policy acceptance when it becomes entrenched as a dominant technological regime. To be a regime, it must become strongly legitimated and socially reinforced so that it defines the new common sense. Freeman’s analysis suggests, although he does not explicitly state it, that around these mismatches will be found the play of power and of resistance by entrenched interests, particularly those key forces wedded to the old regime, and its former ordering of the world.

A critic of the Perez and Freeman model might contend that the notion of a ‘good-match’ pushes one into functionalist territory; or even perhaps further into normative views about ideal states and the optimisation of match and fit. In fact, given the Schumpeterian and even materialist roots of their model and their avowed purpose to understand the inner motor and dynamics of technical change, any such normative imputations are quite removed from their specific intentions.

However, the existence of institutional mismatches, gaps, and disconnects provides room (or degrees of freedom) for new social interpretations and the active construction of meaning. The taken-for-granted world of the post-War period is put into brackets. Questions percolate up, such as how should we internally organise and optimise companies and firms; what is knowledge-based productivity, and

how is it to be pursued; what should supervisors and workers be doing to manage change; how is the labour force being restructured and what is the futurity of jobs and work; what is the role of central institutions of socialisation such as schools; and where is the policy sphere in all of this?

A very long time may pass before another 'good match' takes hold between social groups and strata of people, their corresponding institutions, and the dominant paradigm. Retrospectively, perhaps the shared model of common sense experienced during the post-war period of industrial prosperity was unique to the advanced industrialised countries. Perhaps it did not really exist. What is interesting though is to see how humans act to shape and integrate with the evolution of the rising regime, or how they choose to ignore it. In so doing, this involves the development of accounts and perceptions, as well as struggle; if not of the class kind suggested by Marx, at least of the agency and social action kind suggested by contemporary sociological theory. Closer study of the interaction of techno-economic change and social and institutional change is a necessary complement to studies of macro-level transformations.

3.2 Information Society Theory

A comprehensive survey of the information society stream of research is beyond the scope of this exercise. Richly detailed summaries are provided by Lyon (1988) and more recently by Webster (1996).[xix] Instead, comments from Jeremy Rifkin and William Reich on macro-level dynamics are used to relate techno-economic trajectories and dematerialisation processes to each other.

Rifkin's (1995) diagnosis of the displacement dynamics unleashed by ICTs is dramatic and seems to have been written to shock policy people into action. He claims that the market system of production has made both workers and work redundant; that goods and services can be supplied by corporate automata; that hundreds of thousands of working people will be made redundant and cast aside to join those already marginalised; that world unemployment and underemployment will balloon from its current level of eight hundred million to an astronomically high level; that an underclass will form with a desperate and criminal sub-culture; that we must prepare for a society without mass formal employment; and that the concepts of productive work and a productive life will be turned on their heads. In short, he claims that the continued advance of computer and communication technologies spells doom. While his prognosis is highly debatable, if he is even partially correct, the implications of his thesis are far-reaching.

He argues that growth in the new economy is extremely limited, both in absolute numbers and in quality. He contends that the only segment of the US economy which is actually experiencing real employment growth is the so-called knowledge sector, by which he means those who, by virtue of technical and professional credentials, or by virtue of their innate abilities, are part of a cosmopolitan elite of 'symbolic analysts'[xx] that make a living working with words or numbers and symbols, codes, policies, laws and regulations.

The goal of this elite is to create and sustain the protection of intellectual property and to exert, where possible, a monopoly over ideas and knowledge. Following in the footsteps of previous hegemonic elites, Rifkin contends they will wish to screen admission and entry to their social circles. This strata, he believes, will always be well staffed by the recently minted, certified, and credentialled.

In contrast to Rifkin's doomsday outlook, Robert Reich (1992) offers a useful, even if highly simplified analysis of the system of occupational stratification that meshes with the new economy. He perceives a general shift from vertically organised national corporations to multinational enterprise webs that includes a shift from high-volume activity to high-value activity. High-value activity depends on minds, ideas, concepts, and their progressive implementation through problem identification, problem-solving, and brokering, but also by thinking through incremental improvements at every phase and turn of product and service activity. Reich thinks that the core activities which fit this model, taken together, comprise the labour of the *symbolic-analysts.*

Jettisoning traditional distinctions like white and blue collar work, he suggests there are really only three dominant types of jobs and structural positions or occupational strata facing workers; *routine production services*, *in-person services*, and *symbolic-analytic services*. The rest, like agriculture and so on, are deemed residual.

The *routine producers* typically work with many other people, often in large enclosed spaces, where there is lots of supervision, sometimes by computers, and where the same activities, following standard procedures and rules, are repeated. The *in-person services* employees also do repetitive and simple tasks, but they work with people rather than materials and things. They may work alone or in small teams, but they all require direct contact with the beneficiaries or clients of their work, and are closely supervised.

The third group, the *symbolic-analytic services*, includes all the problem-identifying, problem-solving, and strategic brokering activities associated with a high value approach to economic competition. Their services can be traded world-wide. They identify, solve and broker problems by manipulating symbols, plans or formulae, legal arguments, financial suggestions and human insights. Sometimes they amuse and entertain people or offer other techniques of charm and conceptual sleight of hand.

The income of symbolic analysts often varies remarkably and depends on originality, cleverness and speed in problem-solving, and on the ability to identify and broker solutions to new problems. They require frequent team contact followed by periods of fiddling with symbols or words, punctuated with long phone conversations, lots of travel, and the issuance, from time to time, of plans, designs, drafts, and memorandums to be discussed in meetings to determine the next steps. Reich estimates (perhaps too generously) that about 20% of the US work force fits this profile, and to use Castells' phrase, they mostly live in the 'space of flows'.

If Reich's analysis is correct, one would expect increased social emphasis and greater allocation of social honour to be accorded to the work of 'symbolic analysts', and others who comprise their support structure. This overall shift in the valorisation of the occupations of symbolic analysts is at the very institutional core of processes of dematerialisation. It has implications for reshaping, in community consciousness, the iconic character of the status order.

4. Summary of Macro Level Trends

What can we deduce from these analyses of macro-level processes? Firstly, these diverse views point towards underlying patterns which potentially derive from processes of dematerialisation. These are macro-level and highly dynamic processes, involving both national and international dimensions. They are propelled by the evolving nature of global ICT networks, as well as shifts in capitalist investments and in perceptions of economic value and where to put smart money.

Secondly, macro-level processes seem to 'shake-out' or pattern into social structural configurations. These new configurations involve income polarities, new categories and strata of occupations, new status group configurations and their flows, and an overlay of institutional dualities and mismatches as one technological regime begins to replace another.

Thirdly, care is necessary to distinguish between the increasing centrality and embeddedness of knowledge in economic activity that *accompanies* processes of dematerialisation, and a conclusion that we now have a new type of society, in this case 'a dematerialised society'. Our preference is to speak not of a dematerialised economy or society, but of *processes of dematerialisation* which affect national economies and global activities at different rates and speeds.

The evidence of these macro-trends is still speculative and exploratory. It is useful to remind ourselves that the dominant economic mode remains capitalism. We still live in a market society and

the eclipse of state socialism seems to have rendered this to be doubly true. What is empirically observable though, is the rising arc and vigorous global trajectory that is animating capitalist growth. Still the global dimension of capitalist expansion was almost always present and has been around for centuries (see Wallerstein, 1974 and Pavitt, 1980).

Given these provisos, what is left that amounts to a new twist? Something complex appears to be going on that is affecting the concept of economic value and its perception.[xxi] These changes are captured, but certainly not explained, in the concept, processes of dematerialisation. Dematerialisation processes and accompanying shifts in the perception of economic value away from material things and towards bits and knowledge, will almost certainly have implications for social structure and for ideological conceptions of property, wealth, status, social honour and prestige. The next section helps to unpack some of these possible truths and meanings by relating dematerialisation processes to status ranking.

5. What is Social Status?

John Scott has compactly described the social stratification of society as 'its internal division into a **hierarchy** of distinct social groups, each having specific life chances and a distinctive style of life'(Scott, 1996:1). That said, hierarchical divisions that mark identifiable status groups are subject to enormous cultural and interpretive variability.[xxii] Their social importance derives from their *reproducibility and transmission* through recurrent patterns of social distinctiveness and social closure. This rests on powerful forces of social inclusion and exclusion; those specific points and moments where self and society meet and intertwine.

Status processes act to mark out relevant social distinctions; order these distinctions hierarchically to reflect the allocation of prestige; and effect social closure to reinforce status group boundaries. It could be said that insofar as humans are social and communal, the processes characteristic of social stratification and status group ranking inevitably appear, each being, as it were, dialectically embedded in the other. To be social is therefore to be marked and ranked, both through and by distinctive features.

Still, the historical and cultural forms that humans define and select when they engage in social ranking are profoundly diverse. Those living in Europe or North America are most familiar with occupational and professional prestige ordering, since these symbolic rankings have typically accompanied capitalism and modernity (Coxon and Jones, 1978). However, other material and social forms generate vastly different systems and criteria for the identification of status groups and relative social ranking. One has only to think of the social positions of castes or of the feudal aristocracy, or of warriors in military societies, or of the perception and place of slaves in relation to freemen (sic) and citizens.

Yet these sharply dramatised examples, based as they are on gross social inequalities, sometimes divert our attention from more mundane processes. Not all systems of social ranking involve such sharp juxtapositions. In fact, in hunting and gathering societies, social ranking is often based on consanguine and kinship features and on familial ordering, including in numerous cases, matrilineal ordering and descent (Harris, 1985). Even within market societies, broad social categories such as 'the middle class' are themselves subject to more finely discriminating features. Vastly different ways of allocating social honour permeate the human experience; and perceptions of social ranking can and do change. Such perceptions are socially malleable in a limited way and subject to continuous modifications, but they are also socially determinant, and therefore not entirely plastic or fully flexible. It is precisely this *flexible firmness* that ensures they are useful to social reproduction.

Fundamental shifts and changes in shared perceptions of status ranking and social honour, their flexible firmness, result from a somewhat mysterious and largely hidden process. Briefly, three key theoretical components contribute to the mystery.

Firstly, there appears to be a key component that derives from interpenetrations between material and technical processes and symbolic and cultural processes (Harris, 1979). So, for instance, warrior status in military societies depends on the continuous development of weapons and their use in winning battles. Secondly, there appears to be an intimate connection between status and prestige ranking and what is called, in the case of market societies, social classes. Is the middle class in market societies a social class, a status group, or merely a social stratum, defined by consumption patterns and styles of life? Thirdly, there is a degree of complexity introduced by the need to examine processes of social change, a notoriously difficult challenge. Each must be dealt with in turn.

It is contended, albeit from several diverse theoretical perspectives, that shared perceptions of status ranking emerge from complex relations between material and technical development and the interactive construction of symbolic meaning through social processes. The constant dynamic interpenetration of these two domains or spheres, the material and technological, and social and cultural interpretations, derives, at least in the view of some, from a dialectical relation that permeates human life (Mansell and Silverstone, 1996). As any specific trajectory (either a material or a socially interpreted one) develops and articulates, it simultaneously folds into and interpenetrates the other sphere and vice versa, and so on *ad infinitum*. So, for instance, four wheeled vehicles are being constantly 'revolutionised' by both social taste and engineering design.

It is important not to foster a material *versus* a social distinction or to carry it too far. Much of the material world is appropriated and shaped by humans, and the items of physical technology and artifacts we construct are themselves cultural constructs. Technologies do not come out of the air or fall like manna or rain from the sky; they are based on vast fields of cultural choice, endless design decisions, and heaps of rational calculation. While the two spheres seem to dialectically interpenetrate, it is useful to remember that each respective sphere may superficially appear to mark contrasts between the material and the symbolic, but they are both *simultaneously* social and cultural products (Berger and Luckmann, 1967). In the final analysis, all humanly developed and constituted technology is but a reflection of cultural choice and selection.
Thus, when specific technological artifacts, items like cars or ICTs, intermediate and interact with other social processes, this is in fact the interaction of one socially constructed and selected sphere with another. The specific question concerns how aspects of the technically constructed sphere, thrown up by ICTs, *potentially* interpenetrates, modifies and shapes perceptions of status group ordering and prestige ranking.

The second important issue involves the more or less continuous conflation that crops up between an understanding of social class and an understanding of social status. This debate is long and arcane but most contemporary scholars take their directions on this matter from Max Weber (1968) who distinguished between three elements of social stratification - class, status and party. Weber argued that each element of the trilogy has a degree of autonomy because it is derived from a specific distinguishing dimension and rests on unique demarcating properties.

Social classes, for Weberians, are collectivities that accrue from similarities in the 'market positions' of actors. Therefore, social classes are by and large coincident with market economies, as distinct from 'estates' of feudal society. In contrast, status groups are marked off by *their allocation of prestige and social honour* within a community that shares common perceptions. Social status is distinguished from economic class because it involves community judgements about social ranking, independent of market position. Lords and subjects can form a reproducible social ranking, whether or not a market society or economic classes (as used by Weberians) actually exist. Status groups are within the sphere of socially constructed and communally held estimations of social honour. Another way to appreciate this distinction is to recognise the differences in social status and social honour accruing to old money as compared to new money, where markers and differentiators are gradually set

up, even though the actual market positions of both, by virtue of their capacity to mobilise resources, may be identical.[xxiii]

Much intellectual energy has been allocated to the Marxian versus the Weberian understanding of the centrality and importance of classes when compared to status groups. In this paper the Weberian distinction between class and status is taken as useful as a starting point for a review of the potential linkages between ICTs and processes of status ranking. Specifically, suggestions for empirical research are concerned with understanding, through observation techniques and formal measurement, the processes whereby new ICTs and social ranking interact.

The third challenge is to study processes of social change. Most studies of change focus on macro-dynamics, not unlike the income dynamics cited earlier, but involving economic, institutional, and cultural features. It is the specific processes at the meso (institutional) and the micro (small group interaction) where important empirical issues lie. Additionally, this work is about social changes, but it is specifically about *emerging perceptual changes.* It is about constructions of social reality and status ordering as they are actually being developed.

To attend to specific community based processes of status ordering, we have found two different bodies of work helpful. The first is an old literature, spawned in the United States during the period 1920 to 1950 involving 'community field' studies. These were derived from the British functional tradition of anthropology (Radcliff-Brown and Malinowski) but the field methods were applied to modern societies rather than to traditional societies. These studies encompass classics such as *Middletown* by the Robert and Helen Lynd, the *Yankee City* studies and the *Jonesville* research of Lloyd Warner and his many associates, as well as other studies like Robert Dollard's work on race and caste in a Mississippi town. They also include urban ethnographic fieldwork such as *Street Corner Society* and *Tally's Corner*.[xxiv] The purpose in reassessing this work is to retrieve from it the role and place of community in mechanisms that construct status ranking orders and that reinforce these rankings through social closure.

A second body of work concerned with community process is authored by those practising the sociology of science. It involves the deeper understanding of scientific life and the construction of scientific facts and careers. Much of this involves shadow debates with Thomas Kuhn (1962), and particularly with Kuhn's sense of the important role that community plays in the perceptions and judgements of scientists. In recent years, Bruno Latour (1986) and others have provided detailed examinations of scientific life (Callon, 1995). In scientific communities there is a highly competitive and continuous process whereby prestige is allocated. This requires the production and circulation of social accreditation. Latour's work has utility in uncovering subtle and hidden processes of community-based evaluation including mechanisms of prestige ranking. It points to ways in which *distinguishing status markers and differentiators emerge* and how they are used to locate participants in specific prestige communities and orders. A review of these two traditions of 'community' research leads to some generalisations about status processes.

5.1 Community Field Studies

In complex market societies status ordering and hierarchy are busy, multidimensional phenomena. In fact, so much diversity in rank ordering exists in market societies, that at times many attributes seem to take on an independence of form, such that we lose the sense of their origins in the activity of social ranking. Examples are the 'automatic' prestige accorded to certain professions, such as the practice of medicine, the social ranking of which is not divinely given, despite the importance accorded to it by television programming and sick people.

The virtue that community studies offers is that they support field hypotheses with actual reports of what people think and do. Additionally, they reinforce the brute fact that social ranking plays a big part in everyday life.

Critiques of this tradition centre on their being functionalist, that is, they presume a given order to any society which is biased against change. However, it is valuable to distinguish between a functional theory of stratification (Davis and Moore, 1945), by which is meant that social ranking is an unconsciously evolved device for ensuring that the most qualified people hold the most important positions, and an approach to the study of community processes that was inspired by the functional school in anthropology.

The functionalist theory of stratification is now held in disregard (Tumin, 1953, 1967), while the functional school in anthropology is still very vibrant.[xxv] This school provided the theoretical foundations for the community studies by the Lynds, Warner and many others. The functional school asks what institutions are dominant in a community or tribe, and how do they relate to the total formation? It looks closely at how people in communities understand their positions in a system of rank ordering permeated by the cultural construction of meaning.

A common feature of many community field studies (at least those done in market societies) is their intense preoccupation with shared community perceptions of the allocation of social honour. This is usually indexed by community status and prestige rankings of families, races and geographic areas. These are then often nuanced to very high levels of discriminating detail and differentiation.

A schematic review of what is known about social status from the community study tradition yields the refreshing discovery of how many things have stayed the same. Indeed, when Caplow and colleagues returned to Middletown fifty years after the Lynds, the overarching theme they chose was ‘continuity’ (Caplow, 1982). Despite all the chatter about social and economic change, the main institutional features within communities have just kept on going. When the original Middletown research was done, during the inter-war and post-war periods, people were inordinately preoccupied with possessions. Possessions were the only response the Lynds could surmise when they wondered, why do they work so hard? Thus, the basic parameters of perceived social status and the community allocation of social honour were set up in relation to something, usually something scarce; property ownership, consumptive capacity, and ‘trying to get ahead’.

In the community field study tradition, status constructions also involve broad perceptions of the worth of labour, or of the lack of worth associated with idleness. Skills are part of the mix too. When these studies were being done, the professional classes were moving towards increased social closure, and people who wore suits and worked in offices had begun to have an extra cachet. The inherent richness of the community field tradition sensitises us to those symbolically charged perceptual maps that people carry around inside their heads and frequently act upon.

This work underscores the fact that the symbol categories used in status mapping are mostly *binary* in character involving one level up in relation to the observer; or one level down in relation to the observer. This observation evolved into reference group theory. Community based status distinctions are also frequently binary in their designations of a brighter side of life and an inferior side; the good side and the bad side of the tracks; or uptown versus shanty town.

The mental maps of status ranking are quite likely to be *dynamic* and *relational* in form, as well as being binary and categorical in attribution.[xxvi] By being dynamic it is meant that they involve constantly moving processes of definition based on the interaction of the technical/material and interpretive spheres and their successive interfoldings and interpenetrations. By relational what is meant is that frequently used (and necessarily simplistic) binary categories emerge out of deeper (and hierarchical) categorical oppositions.

Two insights are usefully taken from the community field studies. Firstly, an appreciation, with the distance of time, that status constructions in these communities had three parts: a) a physical, including ownership and material part; b) a skills, education and training part; and c) a styles of life component. Secondly, there is utility in thinking about ‘categorical relationalism’ and its application to a dynamic understanding of evolving social structures and categories. Categorical relationalism

refers to the mapping built up from binary categorical polarities and reference positions. Allocation to one category can only exist by virtue of the posited other - a sort of social figure-ground gestalt.

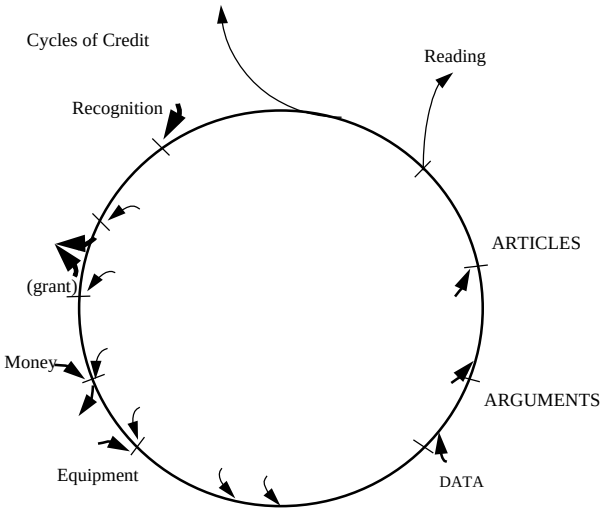
5.2 Science Communities

The work of the sociologist of science Bruno Latour and his collaboration with Steve Woolgar on 'Laboratory Life' (1986) has become a touchstone for studies of scientific communities and for the anthropology of institutions. Their focus on the social construction of scientific facts has yielded insights into a distinct social process that warrants special attention. This is their concept of *cycles of credit* and credibility management as exemplified through scientific activities and careers. These analyses complement aspects of the community studies considered above.

Latour and Woolgar contend that scientists work with a sort of quasi-investment model of personal and career behaviour. Initially, these authors took the frequent use of the term 'credit' by scientists (as in getting credit for something) at face value. This proved unsatisfactory since they noticed that it was only in some contexts that lab scientists referred to credit. From this they deduced that the pursuit of credit was a secondary phenomenon or sub-set of the larger quest for 'credibility'or the attribute of being generally believed in. They put a scientist's professional credibility and its careful management at the centre of their analysis of individual activity. From this they derived a career investment and credibility exchange model of scientific behaviour involving the placement of career bets through positioning decisions, including the habit of moving around to various labs and formal posts.

The essential components of this model are represented in Figure 2. The model reproduces the key fact that it is the 'total cycle' which makes scientific careers work, and that at various points scientists can exchange credibility from one kind of benefit into another; from peer recognition into equipment, etc.

Figure 2: Latour and Woolgar's Cycles of Credit



Note: This figure represents the conversion between one type of capital and another which is necessary for a scientist to make a move in the scientific field. The diagram shows that the complete circle is the object of the present analysis, rather than any one particular section. As with monetary capital, the size and speed of conversion is the major criterion by which the efficiency of an operation is established. It should be noted that terms corresponding to different approaches (for example, economic and epistemological), are united in the phases of a single cycle. Source: Latour and Woolgar (1986).

This specific portion of their work dealing with the human motivations of scientists is arguably both right and wrong. It is right in the sense that the analysis is profound, but wrong in that it uses utilitarian terms to resolve the inner meanings of scientific motivations. While accepting their basic argument that credibility, rather than credit, is being sought, it does not go far enough.

They developed the credit model because it arose from science talk. They shifted to a credibility management model because it was generalisable. However, in the author's view, the credit and credibility models refer simultaneously to an even wider social process, namely prestige ranking and the allocation of social honour. Their accounts of scientists' thoughts and calculations about their careers can also be seen as navigating through the complexities of the community allocation of social honour. This reinterpretation of Latour and Woolgar's results is Weberian, that is, it holds true to the idea that community status and prestige processes are not reducible to economic or rational utilitarian logic. These processes exist in their own right, within a distinct social and attributional sphere.

A careful reading of their discussion of cycles of credit sees scientists as engaged in *the process of credibility management for purposes of refining and enhancing their prestige standing within their reference community*. This allows for a wider appreciation of these transpersonal processes. Scientists do not openly talk about social prestige, but use terms like credit or recognition instead. This is done for the same social reasons as in other quarters; it seems unduly boastful and egocentric to draw attention to one's social honour.
Many examples portray the operation of the distinctly human and social desire for respect, social honour and prestige and these abound in Latour and Woolgar's transcriptions:

> 'I want a very rare commodity; recognition from peers .. I moved to science'. (p. 190)
>
> 'Last week, my prestige was very low, X said I was not reliable, that my results were poor and that he was not impressed .... Yesterday, I showed him my results.... good lord, now he is very nice, he says, he was very impressed and that I will get a lot of credit for that.' (p. 202)
>
> 'Unable to renew his capital, he began to see his position weaken and his status lowered even though his academic position remained unchanged'. (p. 224)

The heart of Latour and Woolgar's position is revealed in this key sentence: 'It becomes clear that sociological elements such as status, rank, award, past accreditation and social situation are merely resources utilised in the struggle for credible information and increased credibility'(Latour and Woolgar, 1986). However, the reverse may also hold: credibility management processes may be a manifestation of deeper social ranking and prestige allocation and accumulation functions. This does not diminish the explanation of how social honour can be exchanged and traded for other things. Nor does it diminish the contention that scientists primarily engage in social interaction to produce credible facts and information. It simply points to the need to explore the deeper processes involved.

This discussion calls our attention to the extraordinarily hidden nature of social honour and the operations that govern its allocation. Increased understanding of the **potential changes** in status perceptions accompanying the rise of ICTs therefore depends on a careful delimitation of the core processes that need further observation, and on the active use of a community understanding of status markers. The tradition of community research has been reborn and given new life through detailed studies of scientific and specialty communities, involving the observation of interaction of scientists and others in their laboratories and projects.

There is a need for a detailed examination of *status markers and descriptors as well as status process differentiators* in other settings that characterise the emergent communities, which have been widely assumed to be associated with the new ICT paradigm. These need to be based on social situations where technology and people interact and construct meaning. *Status markers* can be physical features, or social distinctions based on socially defined categories. They can be based on physical attributes such as, for instance, when people are perceived as male or female, or they can be socially defined as real, for instance when someone is deemed to be masculine or feminine. Status markers are categorical features around which the active construction of social inclusion and exclusion can take place.

Status differentiators, on the other hand, are broader processes, usually institutionally embedded, whereby a marker is given widespread collective validation, assent and reinforcement through social reproduction. A radical example of a status differentiator, as an institutionally embedded process, is apartheid. Both status markers and status differentiators 'take difference seriously', but differentiators formalise difference and convert it into grounds for social inclusion and exclusion, for receptivity and for closure. For both mechanisms, the human consequences are real and not infrequently hurtful and oppressive.

Small scale community or sub-culture studies, in locations where ICTs intermediate, can be used to find evidence of actual shifts in social perceptions. People in such settings, it can be hypothesised, likely place ICTs somewhere in their evolving cognitive maps, and ICTs are likely valorised and appropriated by particular status groups and segments who interact intensively with them. Evidence drawn from recent social trends and tendencies assists in evaluating status markers for those who currently embrace ICTs. Their counterparts, the ICT avoiders, are equally important in the overall relational and categorical defining process.

6. Access Stylisations: Some Status Correlates

What are people really doing with new technologies? While technology is happening all around, it is much more difficult to get a secure empirical grip on basic behaviours and use. As far as perceptions are concerned, even less is known.

Part of the problem is that most of the existing data have been collected for short term market research purposes. In order to extract from them a better use, it is helpful to treat the use of the Internet as a prototype or exemplar. Looking at the known status characteristics of Internet users, for which limited data do exist in several countries, is useful. Access to, and use of, the Internet provides a proxy for the broader question of whom is involved with ICT technology.

The Internet is also a useful exemplar of access issues because, at present, its use requires computer mediated forms of communication (CMC). While access in many countries to communication networks through analogue circuits is a longstanding achievement, access that involves the interactive transfer of digitally encoded signals through digital networks is a relatively recent amplification. It is the digital encoding of information into bitstreams, washing through the various interlinked networks (at present both analogue and digital), that forms the core of the global circulation of information and knowledge. Additionally, it is the *two-way interactive capabilities* of this digital form of communication, which allows for up-transfer, down-transfer, and client use and input, that defines its essence as a medium. Costs of carriage and capacity are falling; while added intelligence and huge network externalities make digital communication highly attractive. The current basic access requirement, for skills in CMC, may modify as technologies and services evolve. However, any useful working definition of access should be alert to both present conditions and future possibilities.

Previous work by the author defined access as **to** something and **for** something; *namely, **to** the digital techno-structure*[xxvii] *and **for** entry into and participation in interactive computer mediated communication networks.*[xxviii]

Statistics on Internet access and user profiles clarify how this works. Evidence from a range of marketing and opinion survey studies in North America suggests that different demographic groups and social strata gain experience of the Internet very unevenly.[xxix] For instance, a profile drawn largely from studies in Canada suggests that North America's Internet avatars *are mostly* young and male, quite affluent, with extensive education, living in big cities, consumed with the work ethic and strong believers in the benefits of applied technology.

The patterns marking out high levels of participation with other parts of the ICT universe, such as ownership and use of personal computers, modems and associated digital peripherals (CD players, cell phones, etc.) are relentlessly repetitive of this basic profile (European Commission, 1996, 1997). These demographic profiles indicate within the limitations of existing measures that, for many people, access to the digital information techno-structure is minimal or even non-existent.

The empirical correlates involve steep positive gradients with a series of well known variables that measure socio-economic status such as income, education, and urban size and location.

There are various hypotheses to account for the gradient. For example, perhaps enhanced access to resources in the digital domain for those with higher income and education, contributes another element to existing patterns of achieved status, thereby enhancing social closure and social position. Perhaps the existing correlates indicate the rising fortunes of a specific technical and professional elite, a new cyber-strata, in ascendance through the status order. Under this hypothesis 'being wired and digital' would be a new requisite membership card for important fractions of the middle class, and for members of specific technical and professional strata. Perhaps they echo the new technical complexity of society, where various devices, such as digital assistants and cell phones, are now personal companions for many people and badges of membership in certain strata. What seems indisputable, given the observed empirical regularities (particularly the correlates with income and education which are both strong social status indicators), is that in some important ways the technical sphere is being rewoven into the social sphere.

While there is a danger of oversimplification, existing qualitative and quantitative evidence *on attitudes to new technology* characterise people as being divided between the 'technophiles' and the 'technophobes'; the enthusiasts and the fearful (Industry Canada, 1997). In turn, these polar attitudes split along lines of age (with youth being the more enthusiastic) and gender (with males being the more optimistic). However, a fault line beneath these splits may be a function of the amount of previous direct hands-on experience that individuals have with new digital technologies. Those without significant contact experience seem lost and afraid of the (possibly objectivised) power of new technologies. This evidence, limited as it is, may also point to deeper status insecurities.

In the industrialised economies that dominated the post-war period, social status (and market-derived class position) could be measured through reference to material things such as land, buildings, equipment, inventory, or by referencing the salary and wages for individuals and families. The grid of social stratification in an industrial, and even a service society, could be fairly neatly pegged to capital ownership, income and consumptive behaviours (Parkin, 1971 and Giddens, 1973).

Evaluating social status and position in the emerging information and knowledge-based economies is less straightforward. In the newly evolving economic formation, social stratification appears to be even more *multi-dimensional*. At least superficially, it appears *to be simultaneously about* property and ownership; and about income and consumptive life-style choices; and about occupational position or location; and about skill sets and competencies required for membership in the new strata of knowledge and symbol workers; and about differential access and use of the digital information techno-structure.

This is due, in part, to the fact that within the evolving economic formation, information (and knowledge) appears itself to have some proximity value. Therefore, *access* to information and knowledge resources and to digital technology (even to mundane things like e-mail) can mean or symbolise certain things within the status order. *Ownership or lease* of digital resources (by persons or institutions) can signal other things. The ability to *develop and produce* information can symbolise yet other things and the skills of *codification* still other things. From this flows the idea that access by citizens to digital information resources and to the information techno-structure may be similar to access to household income two decades ago; a basic requirement for participation in advanced market societies.

Earlier work by the author sought to locate people by virtue of their enhanced access to, and participation in, the digital techno-structure on a crude continuum (Neice, 1996). Those people who were seen as 'wired' and information and skill advantaged were deemed *the information proximate*. The less connected or unattached, comprising those who are more likely to be excluded or marginal to techno-structure access were deemed *the information periphery*. While these categories are simplistic they are meant to signal participation polarities. They are not meant to be mutually exclusive in a social measurement sense. With refinement, they could become wedded to measurement tools. They do sensitise us to disparities in a *participation continuum* with most people falling somewhere on the array.

Points of (physical) contact between individuals and the digital techno-structure are of course the most trivial aspect of access. Yet data show that even these vary greatly across contexts such as at work, at home, at school or when engaged in commerce or using community facilities such as libraries (US Department of Commerce, 1995). Closer appropriation of specific technologies, through either ownership or lease of hardware, networks, or information resources, is a deeper level of access. The nature of work and its interdependence with CMC and ICTs is another deeper engagement still. The capability to create and produce digital resources, as distinct from just receiving and consuming binary coded signals, is another layer of access, and so on.

The information techno-structure is complex and relies on explicit knowledge of the tools of ICT, abilities often gained through extensive training and peer group association and reinforcement. It also relies on technical support systems and even supportive (but expensive) technical communities such as large organisations (both public and private) often provide.

Another not inconsiderable concern about unequal access to and participation in ICTs and CMC involves the ability to absorb and process vast amounts of information, much of it trivial (Boisot, 1995 and also Credé, 1997). Some individuals may thrive in information intensive activities due to certain capacities they possess for information absorption and processing.

In summary, truly effective social positioning within the informational mode of the market economy, as Castells might call it, rests on at least three types of access: a) material and physical access to infrastructure, networks, hardware, and support resources; b) access to related occupations and specialised technical training, skills and competencies (including the skills to produce value input) while staying current with accelerating developments in CMC; and c) access to social groups and communities that reinforce formal skills and facilitate a tacit knowledge base. All these factors together may act to reinforce social distinctiveness and promote social closure.

7. The 'Net as Frontier' Metaphor

Before specifying the cluster of status markers and differentiators that emerge from existing research, a brief detour into the metaphorical territory of the Internet is needed to set the stage. There is a notion, held by many, that 'the net' is some sort of new frontier. This has various expressions and is found in language descriptors about the Internet and in the wider cyber-culture it is said to nurture and spawn. It is promulgated both by journalists and academics (see almost any issue of *Wired* magazine). The metaphor is present within specific organisations of people devoted to developing the Internet, and is used by designers, such as Vincent Cerf (Gilster, 1993), and by its protectors, such as the Electronic Frontier Foundation (EFF), and its replicas in other societies.

What is curious about this metaphor is the image and meaning it attempts to project. It implies things like new and uncharted territories ripe for exploitation; real personal freedom of thought and expression; and a levelling of opportunity and access such that those who arrive at the frontier are among equals. It implies the very picture of egalitarianism, realised through the actions and choices of

frontiersmen (sic), and draws upon the continuous mythical features of the old wild (US) west. Now, is this metaphor really applicable?

Fortunately, the accuracy of its claims can be considered by drawing upon a little comparative social science. A seminal but long neglected article by Murray Melbin (1978) entitled 'Night As Frontier', describes the main social structural features that characterise frontiers. Melbin's hunch was that as uncharted geography in the US declined and settlement spread, the frontier take-up might transfer into time, through an increase in wakeful activity. For Melbin, the gradual occupation and appropriation of the night was reported as a new and equivalent frontier. Besides empirically measuring the growth of human activity into the night, he showed that night time social life, in urban areas of the US, closely resembled social life in former land frontiers. To demonstrate the features of this hypothesis, Melbin first isolated a set of commonalities for frontiers, searching to see if a single explanatory theme could 'account for the spread of people and activities; whether in space or time' (Melbin, 1978: 6).

The ten salient common features of frontiers are reproduced and commented upon in Table 1. They are divided into geographic items and night items and include 'net' items as plausible extensions of Melbin's framework. The ten items isolated by Melbin fit rather well with the development of the Internet. Melbin's explanatory framework offers interesting parallels and insights. What the metaphor masks though, by focusing on common institutional features of frontiers, are the specific status markers and process differentiators that accompany the three distinct frontiers.

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Many binary social categories and stereotypes were born on the geographic frontier; for instance, ranchers and sod-busters, lawmen and outlaws, ladies and whores, gamblers and men of the cloth, drunks and those who took the Temperance Union pledge, Texas Rangers and Indians, scoundrels and decent folk, and so on. On the night frontier, there are gays and straights, johns and working girls, bag ladies and celebrities, musicians and day jobbers, cops and druggies, killers and victims, etc. *The frontier metaphor as it applies to new technologies and perceptions of social status, is important, but so too is what it reveals about emergent differentiator processes and the stylised status markers and categories that arise from an interfolding within a frontier of the technical and social spheres.* If the Internet is truly an emerging frontier; this provides room to look at the social construction of status categories while they are actually in process.

Castells and Hall (1994) offer an overview of accidental and directed attempts to create urban areas focused intensively on science and technology activity. They attempt to characterise the basic elements of US 'silicon valley culture', including the values and life-styles of executives, engineers, technicians, and skilled workers that, together, comprise the upper tier of this polarised high-tech work force. While their portrait is drawn from journalists' accounts and community surveys, it is illustrative of the values and orientation of the California frontier techno-elite. There are nine interrelated features:

1. The centrality of work in their lives
2. Adherence to the ideology of innovation and 'can do'
3. Entrepreneurialism
4. An aggressive competitive spirit
5. Extreme individualism
6. Affluence and its naked pursuit
7. Merciless techno-stress and uncertainty

8. Distinct (in this case corporate) sub-cultures
9. Compensatory consumption

Table 1: Some Common Features of Frontiers

1. Advance is in stages; involving successive steps in the colonisation of regions.	
Old West	includes the fact that life-styles were different for successive stages as fur traders were followed by cattlemen, ranchers and then farmers
Night	the succession involved isolated wanderers, then night and grave-yard shift workers, and then consumptive activities, some quite 'wide-open'
Net	many steps preceded the world wide web
2. The population is sparse and also more homogeneous	
Old West	the line between settlements and wilderness was often paper thin; mostly composed of vigorous young males, sometimes looking for scarce females
Night	the colonisation of night fits this demographic picture
Net	initially mostly academics/researchers; now many young males with emergence of the .com domain
3. There is welcome solitude, fewer social constraints, and less persecution	
Old West	escape from duty, class or religious oppression, and complexity are common themes of motivation
Night	possession of streets and venues at night is more easily accomplished, there is less crush, less surveillance and more expression of identity by those who are different or stigmatised
Net	computer mediated communication invites seclusion
4. Settlements are isolated	
Old West	small and scattered with few links to either each other or the eastern US
Night	night involves separate pockets of wakefulness, with little communication between pockets
Net	nodes were often very distant from each other
5. Governance is initially decentralised	
Old West	the interpretation of law is selective and locally constructed and amended
Night	different rules apply at night even in quite restrictive institutions such as hospitals; the same goes for street activity
Net	initially not governed or 'owned' by any formal legal apparatus
6. New behavioural styles emerge	
Old West	rugged individualism applied; the frontiersmen left proper society for something different; lonely isolation often meant creating deviance
Night	the night archetypes include jazz musicians (and audiences), transvestites, schizophrenics, and is thought by normal day people to be 'the haunt of weirdos and strange characters'
Net	read the newsgroups; all fetishes are catered for in abundance
7. There is more lawlessness and violence	
Old West	guns, shoot-outs, thievery, gambling, bawdy houses, and even lynchings were, if less common than popular image might suggest, still a fact of life.
Night	night is more crime ridden and fraught with dangers and nefarious activity; even though it is concentrated in certain hours and certain places.
Net	viruses and spamming and flaming abound
8. There is more helpfulness and friendliness	
Old West	accounts of the geographic 'west' are replete with examples of community activity and warmth
Night	social psychological tests, comparing the same activities requiring the cooperation of strangers, found that night produces more help.
Net	'newbies' usually get a helping hand from more experienced hands
9. Exploitation of the basic resource finally becomes national policy	
Old West	there was a long delay between settlement and formal recognition
Night	the development of shift work and labour policies as well as standards to facilitate round the clock activity came way after time was colonised
Net	NIIA (National Information Infrastructure Agency) and CANARIE (Canadian Network for the Advancement of Research, Industry and Education) arrive after 30 years
10. Interest groups emerge	
Old West	both ranch and farm blocs lead to the formation of political protest parties
Night	some night-leaning people form alliances such as the Gay Liberation Front and COYOTE (Call Off Your Old Tired Ethics)
Net	EFF (Electronic Frontier Foundation) and others form as well as do other international advocates

Source: Compiled from Melbin (1978: 6-18) and author's extension.

What is interesting about this list of values, now embraced and treasured by 'the highly wired', is its correspondence to the expected values of those stylised as Internet users. Further, it has a strong correspondence with many of the social characteristics that may be thought of as requisite for entry to the frontier. What is noticeable is the wide gap in this list of values between what might be called radical meritocratism and the frontier (and Internet) mythology of egalitarian commonality and community. What is distinctive about the list of Silicon Valley values is not the reinforcement of an image of possible entry for everyman (sic), but rather the postulation of a set of requirements for a sort of silicon superman (sic).

In summary, extension of key social and institutional features of frontiers to the Internet appears to be warranted by previous theoretical and empirical work. It produces a requirement to examine the specific status labelling that pervades frontier constructions of social types and categories of people. The pronounced binary and relational character of these social typifications also surfaces. Processes that demarcate important status distinctions and reify them as binary relational categories are as likely to be a feature of ICT and Internet activity as they are of any other frontier or community.

8. Access Hierarchy: Status Markers and Differentiators

If we want to map the empirical implications of this analysis, where would we begin? We would need to chart the revised forms of digital participation and perceptions of social status in an evolving economy and society. Could we observe and then measure variations in these evolving types of participation, isolate new categories of community status perceptions, define new structural and occupational locations, identify key skills and competencies, and describe new consumptive values and life-styles? If new methods and measures were proposed, how would they differ from traditional indicators of social status and inequality?

While recognising their socially selected and constructed character, the advance of ICTs into contemporary life has for many people required that they actively seek strategies to reorder and re-prioritise their work, home and community lives. If economic value is increasingly shifting from objects and things to bitstreams and knowledge, what strategy can be used to trace implications for social structure and for ideologically embedded conceptions of property, wealth, status, social honour and prestige? Given the long and enduring fascination with material commodities, i.e. with the outpouring of things in market economies, dematerialisation processes pose challenges for legitimation. This is because they require new and rather firm beliefs that bits and their pursuit are worthy of effort, and that bits embody sound exchange value.

What is not visible is the **potential** reordering that stems from the posited shift in the location of value. We hypothesise that this is taking place in the construction of social markers and differentiators. This **potential** recasting of social markers flows out of features in Table 2 which summarises the trends identified in this paper.

The processes in Table 2 are occurring more or less synchronously and they are distributed across the macro, the meso, and the micro levels of analysis. At the global and societal levels the changes involve techno-economic trajectories; changes in the mode of development and in factors of production; the construction and articulation of global network infrastructures into all encompassing connectivity; and the shift to dematerialised economic activity, including the dynamic factor of 'infinite expansibility'.

Table 2: Trends Affecting Potential Shifts in Categories of Status Consciousness

- a trajectory in which ICTs are increasingly becoming the dominant regime, or as Castells' calls it, the *informational* mode of development;
- a general perceptual shift towards the *valorisation* of information and knowledge work, or the rise of the symbol analysts;
- displacement and adjustment effects involving a reordering of meaning for words like laid off, retrained, contingency worker, contractor, part-timers, home-based, tele-worker, and flexible worker and the like;
- either significant access to, or ownership of, ICTs and digital resources, often aided by institutional support;
- specific behaviours and an orientation leaning towards a range of services and applications involving digital technologies and resources;
- advanced skills that allow work at various degrees of efficiency and productive complexity with the digital flow;
- values and lifestyles that emphasise 'frontier-like' distinctions; and reinforcing patterns of social closure based on status distinctions through the expansion of digital work culture; linkages with associated forms of cyber-leisure; and continuous social reproduction through 'the space of flows'.

At the meso or institutional level, it involves labour adjustments and skill and competency mismatches; human fears of displacement and new patterns and categories of adjustment and adaptation; new languages to describe the incorporation of technology; and new occupational definitions of who does what and why. Also, it entails new strategies of management control and reinforcement of hierarchy; new rules for the governance and use of technologies and their purposes; and new policies struck by organisations to provide sufficient illusion of managing the tide.

At the micro-level, and at the one-to-one and small-group level, it involves social marking, sorting and labelling, categorising people and experiences, channeling requests and demands, experimenting, finding and setting examples, contesting and struggling laterally and vertically, forming impressions and 'takes', evaluating oneself and others, and continuous social judging and status ranking. Some things will mark and others will socially reproduce through differentiators.

This complexity makes it necessary to ground analysis in specific observations and examples and again the Internet offers a useful exemplar. While the Internet fits the depiction of frontier activity and reinforces its myth structure, it also comprises the nuclear core of the culture of cyber-space. It is a particularly good way to begin to ground observation.

The key to further empirical observation is likely to be in the discovery of new patternings and typifications involving access to the Internet. Analysis is needed to break down its monolithic character into finer gradations of social distinction and hierarchy. The Internet already may involve socially structured exclusivity rather than egalitarian cameraderie. The inner core of net-life and culture may even approximate or possibly form a 'status estate'.

This possibility is speculative and requires unyielding scepticism prior to the production of hard evidence. Nevertheless, the notion of a status estate resting on, and derived from, digital cultures is more than a passing fancy. Status estates result from clusters of status situations such that the social propinquity stemming from overlapping roles and other features of interaction combine to reinforce social closure. As Scott notes in a discussion of status estates:

> Separate status situations may also be clustered together [in addition to occupational overlaps] as a result of leisure-time interactions, residential patterns, and other forms of

> intimate and informal interaction that result from the exercise of social closure.
>
> (Scott, 1996: 33).

Bryan Turner defines social estates as ‘communal groups which, through various means, enjoy certain forms of privileged access to scarce resources, especially where those scarce resources are of a cultural, moral or symbolic character’ (Turner, 1989: 139-40). The term ‘estate’ in market societies is commonly reserved for the press establishment where the scarce resources fall into the sphere of the power of the printed word. However, it does not take much imagination, especially when looking at the values and behaviours witnessed in Silicon Valley culture(s) to transport the concept of a status estate to describe the features and social closure of the digital and information proximate.

The usefulness and validity of this inference can only be confirmed on the basis of further empirical evidence.

To obtain further evidence, hierarchies of status markers and differentiators can be hypothesised. Status markers are identifiable and observable features, usually requiring either physical or social labelling, while differentiators are processes, which give institutional effect to distinctions. For instance, being labelled as a net-head, may be a social mark of distinction, flowing from perceptions of repetitive behaviours. Being employed as a network administrator in a large organisation may be a process differentiator since it institutionalises difference and sanctions (with approval in this case) a repertoire of skills and behaviours.

Hypothetically derived markers and differentiators that concern aspects of access to the Internet are noted in Table 3. They are of six general types: physical differentiators, information service differentiators, occupational differentiators, and skill set markers, symbolic markers, and sub-culture markers. The list is rank ordered by a subjective perception of their relative importance to net culture. A main task for future research is to examine the relative fit of these hypothetical categories and constructs with actual distinctions in the field.

Field research requires a series of iterative steps where these hypothetical markers are tested against field perceptions. The relational and reference group categories can be examined and then tethered into a wider participation continuum. The social and spatial range that lies between the information proximate and the information periphery is likely to contain a large number of descriptive markers and process differentiators.

Table 3: Potential Status Markers and Differentiators for Internet Users

Physical Differentiators

Bandwidth: more is always better (T1, T2, T3, levels of connectivity) further gradations exist for carriers, providers, specific nodes etc
Specific types of connections and links: hot-wired (Ethernet) versus dial-up; SLIPP/PPP (Serial Lines Interface Protocol/Point to Point Protocol) versus Unix text etc.
Types of platforms and servers: - MIPS (Million Instructions Per Second) count further gradations involving mirrors and server caching and software
Access Locations: big institutional settings are preferred; knowledge and information intensity count, such as is found at universities, libraries, and driven corporations.
Ownership of equipment: lower in position; not as important as it once was; leasing or using something fast is better, but many gradations apply and ownership counts more for status perceptions in the outer circles.

Information Service Differentiators
Encrypted information services: access to what is deemed secret still counts
Password protected data services: restrictions by password entry; second best
Intranet and extranet services: makes data mining definitely possible
Full service functionality: all basic capabilities from email to TELNET no barriers out or in
Hard firewalls and service and functionality restrictions: hurdles to be jumped
Freenets and community nets: nothing is free; limited functions; for beginners.

Occupational Differentiators
Application specialists: the all-stars, like Andreeson (Mosaic/Netscape)
Coders and programmers: creators of new wealth
Cyber-jockeys: includes even Novell network administrators
Symbolic workers: corporate types; the second ring of power
Support information retrievers and modifiers: assist the symbolic workers
Document formatters and viewers: down the hierarchy; a pink collar ghetto
No Internet connection at work: sorry; you lose.

Skill Markers
Codifiers: the top dogs; produce proprietary value: further gradations possible based on languages used, and tricks known
Value-added producers: the dreary symbolic analysts at work
Basic and more complex consumers: heavy emphasis on downloading: gradations possible between newbies and for example legal law librarians

Symbol Markers

Domain name: type
Domain name: ownership
Email: addresses and aliases (some do have extra cachet)
Preferences: for an Internet Service Provider and suppliers (like browsers)

Sub-culture Markers
Net-heads and hackers: fringy; non-corporate; a defining sub-culture
Wired.com: this magazine is definitely the place to be mentioned
Trade show junkies: a badge of hunger for cyber-toys
Permissive consumers: thrill seekers and riders

9. What is Needed Next?

Further adjudication on the points of intersection of ICTs and social stratification cannot be based merely upon recourse to concepts and theory. It can only be accomplished on the basis of observational and empirical examination involving situations, variables and hypotheses. At present, data that would allow further penetration of these issues are not available. This section offers suggestions for the long range development of observational and formal measurement tools.[xxx]

The investigation of processes outlined in this paper requires multiple methodologies. These would aim towards the development of comprehensive comparative measures that could be used for international benchmark comparisons involving the proximate/periphery continuum.

Four phases are required: 1) an exploratory observational phase involving situational settings where ICTs (or the Internet) are a dominant factor in everyday life; 2) a more detailed focus group phase, in which cross-sections of specialists and citizens are brought together to discuss their perceptions and experiences with ICTs; and 3) a survey indicator development and field-work pilot testing phase where the tools developed would gain rigour. Finally, this could be followed by 4) a full national (and potentially international) survey data collection phase. It is not a typical feature of the development of sample survey questions and instruments that recourse is made to qualitative research as a first step. However, the emergent character of the phenomenon requires a blending of qualitative and quantitative traditions.

The pilot development work should accentuate qualitative techniques and use a mix of field observation and focus groups. Qualitative research has risen in prominence in the past two decades (Allesuutari, 1995) when compared to the near hegemony of survey research methodologies during the 1960s and 1970s (Rosenberg, 1968).[xxxi]

There will be much merit in reviewing how the community studies in the US were performed. They embodied eclectic and multi-method approaches. They used systematic techniques like questionnaires, interviews with key informants, archival methods and open ended observational techniques. This multi-method approach offers a great deal, particularly for the examination of new and emergent phenomena such as status perceptions. It is precisely this approach that has informed the work on computers and people by Zuboff (1988) and Turkle (1984). It is also the method used by Mark Granovetter (1972) in his now classic study of the role informal networks play in finding a job.

The virtue of a qualitative approach, at least for development work, is that it allows us to move away from a view of technology that reifies it and looks for impacts and effects. While not easily transcended, the ‘social effects viewpoint’ places undue emphasis on technology as a determinant thing. Consequently, it becomes part of the analytical problem, rather than part of the solution. Implementation of a relational perspective requires some initial field examination of its utility through focus group methodologies (Krueger, 1994; Stewart and Shamdasani, 1990). This input will then be used as a baseline to inform the development of quantitative indicators.[xxxii].

The four phases of empirical research should involve specific approaches. They should not be discrete and sequential but, rather, parallel and interactive.

1. Observation Phase
- to use ethnographic techniques to plumb community based perceptions of Internet access
- to focus on observations informed by an 'Internet status estate' hypothesis

2. Focus Group Phase
- to bridge from specific observational settings to the wider social community
- to capitalise on the power of focus group techniques to examine perceptions of issues in a non-threatening environment with matched sets of people

3. Survey Question Design and Pilot Testing Phase
- to build on the qualitative experiences using standard survey indicator and measurement techniques
- to pilot field test and adjudicate the usefulness of indicators
- to refine and improve them

4. Full Implementation Phase
- to apply the indicators and measures to a national (or even an international comparative) setting with substantial sponsorship

10. Several Policy Implications

This paper raises questions about interacting effects between access to the information techno-structure and community perceptions of the evolving status order. What does this imply for those individuals, social groups and strata who are left out or sealed out, either voluntarily, or due to a lack of accessing tools or skills and competencies, or due to their inability to participate in important status communities because of social closure? What are the policy implications during ongoing societal transitions to knowledge-based economies?

There is now emerging in policy circles some recognition that access to and participation in the information society is an important political issue. In Canada, policy debate surfaced during the deliberations of the Information Highway Advisory Council (IHAC), a federally appointed body that met for three years from (1994 to 1997). In the US, policy attention is guided by the development of the National Information Infrastructure Agency (NIIA); in the UK by the Department of Trade and Industry, through the IT for ALL campaign and more widely in the European Commission.

Policy attention tends to focus on the idea that building knowledge societies means fueling growth and consumption. The emphasis tends to fall on ways and means to achieve equality of consumer access; to get more people plugged in and wired up, as if this were self-evidently a good thing to do. What is missing from the official equation is the sense that the longterm issue may not be consumerism or equality of purchasing and transaction access. Rather the issue may be the access implied and required by citizenship to help level emerging social inequalities.

Citizenship, since the work of T.H. Marshall (1973), has been seen as a special legal relation between individuals and the canopy of the modern democratic state. It leads, in most instances, to certain rights and entitlements that generally are enshrined in acts and statutes. Citizenship also serves as a broad and inclusive levelling status under common law that dynamically juxtaposes itself with social privilege and social class. It refers to and asserts a common baseline of societal participation and inclusion, and usually provides some flow of benefits. It embraces all that we expect in a civil society, enshrined in what is meant when we speak of the rights of John Q. Citizen.

The research programme outlined in this paper suggests that, in the advanced market societies, the interactive blending of the information techno-structure with the social order is assuming a particular shape or morphology. It also suggests that the degree of participation in the information techno-

structure by individuals and social groups is becoming quite marked and segregated. If this working hypothesis is supported, it may be that the policy implications of the research will assist in repositioning the policy debate on access away from a consumer perspective and towards a citizenship perspective. This would invite a new series of policy questions.

For instance, what would define the minimum standard of connection and essential service availability of the digital techno-structure to guarantee a basic level of citizen equality? Is access to email destined to be necessary for all citizens?

What are the skill requirements for members of advanced societies to be digitally literate?[xxxiii] How can the growth of a common base of skills be fostered so that an information society remains open to meritocratic effort? How would education systems need to be recontoured to ensure greater effective equality of opportunity through digital skill acquisition?

Informing policy interests as they shape responses in different countries will be an important ancillary benefit of this research. As recognition of this new factor of unequal access to digital resources intrudes into the policy sphere, interest in it is likely to grow. This will help to attach this programme of research to one of the central issues of structured social inequality in our age.

11. Conclusion

The appearance of a new factor of production that is potentially of sufficient weight to reshape core elements of the social structure is an unusual occurrence. This paper has fleshed out the social and institutional dimensions of dematerialisation and discussed some implications of the ICT revolution for shifting perceptions of social status and social stratification.

What is required for an effective analysis is broad recognition of the interaction of material and technical forms of economic life with social and cultural patterns involving status markers and differentiators. These markers and differentiators arise from community perceptions and interactions and are hosted and reinforced through their becoming embedded in institutions. This form of analysis has been the province traditionally of analysts of social class and stratification.[xxxiv] The literature on community field work has been examined for lessons that apply to examination of the new ICT and society intermediations. The much used metaphor of the Internet as a new frontier has been validated by reference to earlier studies of frontiers. Finally, the idea that ICTs may contribute to the formation of a digital ‘status estate’ has also been posed. This idea has been used to generate several hypotheses concerning social closure and the appropriation of digital technology by a stratum of society for gains in social honour.

Many steps are needed to pursue this research vision. With sufficient interest, resources and effort, a mapping of the participation continuum from the information proximate to the information periphery is achievable. This would bring unmatched analytical power and understanding to an increasingly central feature of social life in the post-millenial period.

The sea changes and institutional mismatches that seem to abound may eventually resynchronise into revised socio-structural forms. Shifting community perceptions of status and prestige may redimension the status order. Only if these processes are documented through basic research, will there be the possibility of reductions in exclusivity through far sighted normative social and policy action involving citizenship.

Notes

[i] The term ICTs is used throughout the paper to refer to information and communication technologies, recognising that this covers a vast array of tools.

[ii] Academic and policy researchers have been noting structural transformations imputed to arise from the rapid adoption and spread of digital information technologies. Commentators from such diverse fields as management studies (Handy, 1990 and Drucker, 1993) economics (Romer, 1993 and Lipsey, 1995) policy studies (Reich, 1992 and Rifkin, 1995) and media and communication studies (Lanham, 1993 and Tremblay, 1996) now generally agree with forecasts by sociologists two decades ago (Bell, 1976 and Gouldner, 1979) that the penetration of information technologies into many aspects of contemporary life is producing large scale social and economic change. Specific interpretations vary widely and analysts often appear to be talking about quite different things.

[iii] For a big picture assessment see the report of the EC's High Level Experts Group (1996). For another perspective focusing on ICT access and European developments and trends, see the work of Robin Mansell and collaborators in the ACTS-FAIR working paper series (1996 and 1997).

[iv] Academic comments on access, while suggestive, are primarily descriptive, or are framed as policy relevant commentary, offered 'en passant'. These authors wish to better understand the so-called 'residual' exogenous factors that they believe make economies take-off, such as innovative activity and technical factors of development. Within this mode of explanation, emphasis has been placed on R&D spending and on national systems of innovation. More recently a turn towards knowledge as a key factor input has taken place.

[v] The prescience of William Gibson in his novel Neuromancer (1984) is instructive as to the melding of mind and networks.

[vi] Practically speaking, the three themes are really just sensitising concepts (Blumer, 1969) for further exploratory work. It is not possible to actually operationalise a research programme at all three levels, but as informing concepts they offer much for thought.

[vii] This is a specialist matter for environmentally astute materials researchers, and focuses on measures in the variability of material inputs and product life-cycles, such as how many authombile tyres are made, how long they last, and what are they recycled into. The environment work is principally focused on macro trends in the output and production of material objects and the burden they place on the environment; specifically how the outpouring of things leads to environmental degradation and whether there is any evidence of this trend slowing. Dematerialisation, for my purpose, is narrowly concerned with the valorisation of the bitstream. Some linkages may evolve between the two usages, but they are not likely to be of the immediately measurable kind.

[viii] Not every scholar cited uses the concept although some do. It is used here to tether several disparate strands of thought and to trace the implications for social structure.

[ix] See Romer (1993). It is possible, for instance, that in a highly dematerialised economy, citizens may be net economic beneficiaries, but at the same time materially less well off than at present. The implications this may have for redirecting the allocation of prestige and social honour are by no means trivial.

[x] Endogenous growth theory was developed through collaboration supported by the Canadian Institute for Advanced Research (CIAR). See Lipsey (1995).

[xi] This notion is another extension of the dominant style of 'Mode 2' knowledge production identified by Michael Gibbons and his collaborators.(Gibbons et al, 1994).

[xii] One has only to think of the infinitely replicable career of all the proceedings surrounding the funeral (and life) of Princess Diana to grasp the concept of infinite expansibility.

[xiii] The distinction between tacit and codified knowledge is referenced by Quah but unexamined. This is illustrative of a different level of analysis referring to what people actually do in firms when they 'add-value'. What is revealing, if one thinks of knowledge generation as the basis of economic growth, is that people's capacity to contribute and benefit is remarkably skewed, since

both contributions and benefits rest on learning, education and other technical and professional skills and resources. The literature on the tacit and codified knowledge debate is extensive. A summary is available in Cowan and Foray (1997). Similarly, those who suggest that (scientific) technology is congealed knowledge such as Callon offer additional insights that are not the focus of this paper.

[xiv] This summary of Castells' work draws from several resources, but is grounded primarily in his tour de force, *The Informational City (1989)*. His most recent books form part of a planned trilogy and *The Rise of the Network Society (1996)* adds certain amplifications to his earlier position.

[xv] Castells' new informational mode, within capitalism, has three dominant characteristics. (1) The appropriation by capital of a higher share of surplus from the productive process; (2) State intervention moves from political legitimation and social distribution to political domination and capital accumulation; (3) The accelerated internationalisation of all economic processes to increase profitability and open up markets.

[xvi] Castells notes: 'the most solid hypothesis advanced in the literature relates growing inequality and polarisation in the stratification system to the changes in industrial and occupational structure as a result of economic restructuring and diffusion of new technologies'(Castells, 1989: 201).

[xvii] Income polarisation is a widely contested hypothesis and others have advanced the view that it is a myth (Beach and Slotsve, 1996).

[xviii] There is another tradition of techno-economic paradigm research which is not discussed here since it is less clearly focused on institutional change. See in particular Lipsey (1995 and 1996).

[xix] The literature on the information society thesis is a mixed blessing, offering both the views of enthusiasts and scornful critics. Sometimes one senses that it is not sufficiently detached to warrant serious attention while, at other times, it is very insightful.

[xx] Rifkin borrows this terminology from Reich (1992). His argument is compelling for its sense of historical precedence and for the way it draws parallels between current conditions and other eras which involved the displacement of workers through the introduction of new work based technologies. He traces the effects that electricity had on industrial productivity and output, such as during the 1920s in North America when factory production exploded without a corresponding rise in demand, leading to the conditions for the Great Depression. Particularly gripping is his account of the displacement of the American Black share-croppers from the delta plantation system during the advent of mechanised agriculture equipment (particularly cotton harvesting equipment), and the effect that this river of migrant people had on Northern cities like Chicago and Detroit. This earlier displacement lead to jobs in auto and meat packing plants. He contends there will be no equivalent absorption of the ICT displaced workers in our times.

[xxi] The economics of dematerialisation processes are just beginning to be researched and will require intense investigation (see for instance Steinmuller, 1996). Its hidden processes cut to the very core of that ancient problem in economics regarding why some things are economically valued and not others. Smith and Ricardo, to be followed by Marx, located perceptions of economic value in labour value and labour unit equivalencies. Then the problem was further subsumed during the neo-classical synthesis to matters of supply and demand and price, which seemed plausible within the post-War industrial period of growth and stability. New economics, besides dealing with dematerialisation, has other paradoxes to sort out such as the tendency of bit based activity to be 'given away'.

[xxii] Almost all of cultural anthropology testifies to this. Based on the record provided by historians and anthropologists, that no (known) society has ever existed without internal gradations of social status or without some system of shared perceptions of individual and group hierarchy and prestige, largely arising from the allocation of social honour. Even studies of communalist forms such as the Bushmen of the Kalahari Desert point to processes of ranking based on gender, age and hunting prowess.

[xxiii] The third dimension, 'party', as Weber called it, reflects the mobilisation of a society's resources by a class or status group or a combination of both, to take and exercise control of a collectivity, usually a society. John Scott (1996) has usefully recast this dimension into the concept of 'command'. It is not of further concern for the matter at hand.

[xxiv] This type of work was of course not restricted to the US, as the work of people like John Seeley (1956) in Canada and Michael Young (1961) in the UK shows.

[xxv] When reading Middletown today it is difficult to come to the conclusion that the Robert and Helen Lynd endorsed patterns of social inequality.

[xxvi] This position differs from the 'relational theory' manifesto in sociology (Emirbayer, 1997). By categorical and dialectical relationalism, we imply a concept closer to Hegel and Marx. The dialectics of Peter Berger and Thomas Luckmann (1996) involve three dialectical moments or steps; externalisation, objectivation, and internalisation. It is the deeper implications of this dialectical analysis for the position of ICTs in social consciousness that is of interest.

[xxvii] The new digital information techno-structure refers to the overall structure of digital information resources and accessing technologies (the networks, pipes and wires, computers, software, modems and protocols, and digital information resources and services).

[xxviii] Previous work contained a normative definition of access for policy purposes. *For our purposes, access by Canadians to the global information highway refers to the progress made towards universal public availability and use of interactive digital communications networks, through a range of communications tools, content and services, that enable us to achieve our goals and develop our potential* (Neice, 1997).

[xxix]. See an earlier work (Neice, 1996).

[xxx] More details are given in FAIR Working Paper N.44 by the same author entitled 'Measures of Participation in the Digital Techno-structure: Internet Access'.

[xxxi] The exhaustion of a research style referred to as 'systematic empiricism' (Willer and Willer, 1973) coupled with theoretical debates about structure, agency and intentionality seem to have triggered a broad return to investigations of the subject and consciousness.

[xxxii] The tool-box of qualitative research has been enriched both by insightful studies (Willis, 1977) and by research methods books including some that emphasise focus groups (Stewart and Shamdasani, 1990).

[xxxiii] Besides mapping dimensions of access, it is useful to characterise the range of new skills required to achieve enhanced participation in the digital culture. At present, following the work of Richard Lanham (1996) these skills are named 'digital literacy skills', since they build on a platform of classical literacy skills, but involve extensions of print skills through person-machine interactions and the juxtaposition of words, sounds, images and other techniques of text construction. Gilster (1997) has also used this terminology.

[xxxiv] However, on that side of the ledger, and barring a few quite important exceptions such as Castells' work, within the mainstream literature on social stratification, there seems to be little recognition of the intermediating role of ICTs. With the abundant daily rhetoric about economic globalisation, the information revolution, the 'wired world' and so on, not to mention the practical fact that new technologies are increasingly unavoidable, it seems odd that little of this 'new reality' has not seeped into analyses of social stratification. By example, within UK academic circles, three major works concerned with the analysis of social class and stratification have been released by Tom Bottomore (1991; 2nd edition), Rosemary Crompton (1993), and John Scott (1996). No mention is made at all of new ICTs, nor is any analysis offered of the literature on the 'information society'. This lack of mirroring or reflection of one body of work within the other is disturbing. It could it be that various technical change and ICT analysts are mistaken, and that the ICT 'revolution' is overdramatised. Perhaps some ICT analysts are being carried along by that river of technological enthusiasm that seems to pervade technical trajectories. Or it could be that writers on class and stratification are caught up in disciplinary debates and cul-de-sacs, and are forced by canons of academic form to rehearse the same set pieces. Or perhaps social commentators are themselves not fully 'wired' or see the current preoccupations with new ICTs as just another fetish that will pass. Any or all of these tendencies may be at work. The gap between the two bodies of literature and the lack of internal referencing is of sufficient importance to be worthy of closer attention and analysis. To begin to assert some fit and association between the present 'two solitudes', the concepts of dematerialisation and status estates are useful starting points.

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