Ideas in Progress

Paper Number 18

Information Technology &
Personal Mobility: A
contradiction or a paradox?

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The series constitute ‘ideas in progress,’ after the
notion described by I.J. Good in ‘The Scientist
Speculates.’ Good also describes ideas about ideas
as ‘partly baked ideas’ believing that “… it is often
to be stimulating and wrong than boring and
right.” While the papers do not take this tenet as an
excuse for licence at the expense of rigour, they are
exploratory and the ideas may change as a theme is
developed over time.

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A Contradiction or Paradox

Authors note

When I was asked to make a presentation on the topic of personal mobility and IT as it is now widely called, the current excitement was still below the horizon. Maybe my viewpoint is unusual having used computer based conferencing and what is now called e-mail since 1974, while the technology to enable this had been around since the late 1960s. Amidst the current euphoria it is easy to forget that ‘information technology’ has been around for a very long time in one guise or another and the purpose of making this note public now is simply to remind people of that fact.

When I was asked to provide an introduction concerning the inter-working of information technology and personal mobility it seemed straightforward, after-all we all know what IT is and it is obvious how it may influence personal mobility - isn't it? But is it all so clear and straightforward? Just what do we mean by 'information technology'; just what is 'personal mobility'? Is there anything new to say about either? Personal mobility has always depended on information hasn’t it? So just what does the word technology add when attached to its counterpart information? After-all the signpost is and remains a very effective example of information technology applied to personal mobility. Anyone who lived in the UK during the 1939-45 war, when all signposts were removed to hamper any possible invasion, will testify to the effectiveness of signposts and the chaos their removal produced. Alternatively misinformation, as exemplified by an Oxford college prank which resulted in the entire through city traffic stream being diverted into a college car park, places a strong emphasis on the need for veracity of the information provided. Information provided at high speed if incorrect, simply causes mishaps and inefficiency more rapidly and more frequently. So is the marriage of information technology and personal mobility a contradiction in terms or simply a helpful paradox?

By now definitions of IT abound; perhaps it is no more than the ability to gather and store information in a form that enables it to be accessed and distributed to a myriad of users whose purposes are either well defined or are random, activated only by curiosity or the occasional need, all related to personal mobility (as an aside, personal mobility can, perhaps, take place either physically or psychically - the first demands direct contact and travel, the second electronic or some other form of communication). The well defined purposes will be for control either through some form of regulation or taxation; random access will be needed for a virtually undefinable spectrum of uses, perhaps including terrorist or criminal activity or simply to enable children to be taken to a tea party. The well defined purposes will be enshrined in law and statute; regulation and taxes require these processes. For that reason they are issues that have become matters of public concern, probably over a considerable period; their purpose will be both enabling and disabling. Matters that fall into the category of well defined purposes may include the control of information flow and the movement of vehicles (of all kinds) through or over defined routes. In this context the concept of 'highways' is already well established for both information flow and the movement of all kinds of vehicles. The definition of these highways lies in the hands of very different kinds of authorities, ranging from those who are concerned with the allocation of frequencies in the electromagnetic spectrum to planning bodies concerned with the construction and maintenance of roads. The way these bodies interact is significant. In the UK some of the most advanced telephone networks,
utilising optical fibre systems, make extensive use of the routes pioneered by the railway network, in this way significant route planning obstacles were avoided. In other respects it is almost taken for granted that local telephone networks can be installed either over ground or underground adjacent to urban and rural roads. These are simple examples of how structural planning decisions taken long ago are now enabling the implementation of information technology, but new kinds of decisions will be needed as the further development of information networks grows. But what of personal mobility? has the reason for that changed? Not much, as the basic reasons for people to move around remains much the same, to work, to play and to socialise. Information technology has perhaps increased the range of choice of activities and where to take part in them but, as Alvin Toffler pointed out in Future Shock, diversity (one aspect of which is personalising of artefacts) is at one and the same time exciting and confusing, providing a form of psychological information overload that can produce a society at odds with itself through frustration of desires. So where are we headed?

Perhaps the first point to recognize is that for all our excitement about the glittering future of computer based traffic control, navigation by satellite information and position control, eighty percent (perhaps far more) of the world's people will be entirely unaffected by these novelties. Indeed for many of them daily bread is a miracle in itself. The only way in which they are affected by information technology is through the navigation systems that on rare occasions enables basic foodstuffs to reach them via aircraft. But what about those more limited areas where information technology influences the majority of the population?

It would be relatively easy to paint a picture of some utopian city in which personal mobility would be smoothened by the application of IT. Indeed such cities were conceived long before the present embodiment of IT was possible, even before the electronic version of the computer became possible (as an aside, Jane Jacobs, in 'Cities and the Wealth of Nations' has much to say about the role of cities in the future, a point that has already been taken up by the 'Five Regions' project sponsored originally by the one time mayor of Mannheim). My colleague, Ian Miles, has summed up the possible futures for IT and its influence on social change in four scenarios one essentially utopian in which the pace and scale of IT-related change will be profound and its role will be generally harmonious; a second where while IT-related change is profound its influence will be generally conflictual. In the other two scenarios the pace and scale of IT-related change will be limited while the influence on social change will be as in the first two scenarios. It is undeniable that elements of all four scenarios are already occurring. Technology has already provided many of the elements necessary for the profound pace and scale of IT-related change, so much so that the limitations envisaged in its polar opposite seem unlikely to occur except through direct regulation and control. Personal mobility could fall into this category. The question is will this happen? The freedom to travel when and how one wishes has become a deeply ingrained expectation (again as an aside, the increasing number of relatively wealthy over 60's will not have their expectations of travel and mobility whittled away - politicians are aware of the growing power of the 'greys' or 'crinklies' as they are sometimes called!); this was demonstrated many years ago when, in a KSIM simulation, it was demonstrated that only direct intervention could reduce the use of the automobile. Industrial distribution systems are predicated on the same philosophy and this has been the main cause of the growth of road transport of goods; the economics have simply fulfilled the underlying mindset. It could be argued that many of the glittering array of technologies now becoming available are intended to ensure that the underlying philosophy of personal mobility remains intact, even though they are cloaked in the guise of economic efficiency. If this were not the case it would be hard to understand why video- and computer-based conferencing have not
achieved greater popularity. And yet the underlying need for personal contact cannot be
denied and cannot be entirely fulfilled through electronic images; the picture of the body in the
street does not leave the same impact as the body at your feet, even though the former can
reach far more people with subtle effects as the Viet Nam war showed. It was noticeable that
in Desert Storm most of the video-reporting was of inanimate objects.

For personal mobility IT has already brought immense benefits even before the acronym IT
was created. Airline bookings are a prime example of this; the complexity and the benefits of
these systems can hardly be appreciated as they are now simply taken for granted. By contrast
air-traffic control leaves much to be desired despite all its improvements. However, the airline
industry already depends vitally on IT for its operation in almost all respects. Aircraft are now
totally dependent on IT systems in some shape or form as are the ground and flight control
systems for both aircraft and passengers. Motor vehicles of all kinds are now entering the
same phase of development as their 'management' begins to include not only engine manage-
ment but also suspension, traction and braking and passenger compartment management, all
in the name of comfort and safety. Other features that can confidently be expected relate to
forthcoming possibilities in the regulatory sphere including -identification to facilitate road
pricing (the modern version of the toll road), distance control devices to prevent collisions (in
the UK 'tailgating' is now a prosecutable offence), automatic immobilisation once the vehicles
fuel/emission characteristics depart from a preset norm, automatic in-car communication to
enable remote policing of motorways and major trunk roads, inertial navigation systems and
in-vehicle electronic maps. These in-vehicle developments will be paralleled by vehicle control
technology installed in or alongside major trunk roads, completing the parallel between air
transport management and land vehicle management.

The timetable has been in existence almost from the time of Stephenson's 'Rocket' and from
the day of the horse-drawn 'bus. Public transport depends crucially on timetables for the struc-
ture of its operations, even if there are times when the underlying structure seems
non-existent. For decades timetable preparation was more of an art than a science, but once
again IT has come to the rescue. If airline passengers represent the ultimate in controlled
freedom to travel, then public transport passengers are at an intermediate point between the
airline passenger and 'private' vehicle owner. Once again IT has invaded the industry in every
sphere, but possibly to a lesser extent and with lesser effect than in either the airline industry or
road vehicles. Perhaps this is a reflection of the culture of the industry; much must change if
the 2000's are to become the 'age of the train'.

All of the foregoing systems are essential to perpetuation of the culture of personal contact so
deeply ingrained in the human psyche. None of it is necessary for a culture based on informa-
tion exchange, as has already been demonstrated by the world's financial systems whatever
their form. Can human society come to depend only or even mostly on information exchange
to the virtual exclusion of personal contact beyond the limits of walking? Ought that to
become the goal of some future society? If so how would it be 'managed'? A society depend-
ent entirely on information exchange must have ways of testing the veracity of the information
it is receiving if it is not to fall into a state worse that of the soma (a mythical mood control
drug) controlled society of Huxley's 'Brave New World'. Indeed the crucial questions of an
information based society are legal and ethical, namely who gathers the information, who
controls access to it once stored; and how can the veracity of the information be authenticated
when all electronically stored and transmitted information can be manipulated in ways that are
not possible with traditional systems?
Are we already living in a world of virtual reality created through the manipulation of information made possible by IT? I suggest that none of us knows the answer to that question except through our limited experiences gained through personal mobility and the freedom to travel; this alone has allowed us to authenticate some of the information on which we have come to depend. For this reason perhaps the idea of IT and personal mobility is not a contradiction in terms. It is however a paradox in which ever more technology is needed to prop up an existing culture based on the philosophy of the need for personal mobility, even though the paradox is often cloaked in the respectability of economic necessity. In the end the philosophy must collapse under the internal strains of resource consumption and the density of the mobile population. What kind of society will follow?

IT is beginning to invade the world of retailing in a major way. Teleshopping is now an established process, at least as far as consumer durables and consumables are concerned; for food it may be further off. The connection to retail banking is immediate through the direct debiting of the purchasers account. Home banking is now spreading, enabling many transactions that would have required a personal visit to a bank to be made from the customers home. Similarly, teleworking is now an established process though the enabling infrastructure is only partly in place. However, despite all its attractions teleworking will require some considerable cultural shifts, involving unfamiliar working skills and social adaptation, even for its partial adoption throughout society. In all these spheres IT has an influence on the need for and the reality of personal mobility. In a quite different sense personal mobility can be taken to mean the ability to move from one employment to another readily. In this context personal mobility raises many issues concerning education and skills as well as arrangements that do not place great penalties on those skilled people whose mobility is highly desirable, particularly in the pension and similar fields. Here some cultural changes have taken place, but they have not yet gone far enough even though those people who are most mobile often do most to look after their own circumstances.

It is clear that transition to a culture based solely on information exchange with personal mobility reduced to walking distance as in the distant past, is a long way off and may never come about. Even with the most absorbing experiences that virtual reality can provide, social contact is and will remain an essential requirement of the human psyche (there is the frightening possibility of virtual reality software being used for social conditioning). IT must then play its part in helping to provide for that requirement by assisting personal mobility to the extent that it is necessary and permissible within the bounds set by resource and ecological (environmental) constraints. At some point restrictions are going to be placed on individual freedom to travel as one pleases in major conurbations. My personal view is that taxation of any form will not succeed unless it reaches punitive levels. Since punitive taxes will be counter productive politically and economically the likelihood of a ‘city wall,’ within which only within city transport will be permitted, must grow. Early examples of this are the many ‘park and ride’ provisions that are being made in many major cities. More extreme examples would be the use of automatic vehicle immobilisers at the ‘city wall’ if they did not carry the necessary authorisation for entry; systems of this kind would parallel current library systems that prevent the illegal removal of books or of clothing from retail stores. Technologies for these forms of control exist, but the implementation of the ‘city wall’ concept remains some way off.

It seems unlikely that personal mobility between major conurbations will move far away from the automobile, the train grande vitesse and the intercity coach. Here all the technologies seem to point in the direction of making the existing systems more resource efficient in both their
capital investment (infrastructure and vehicles) and in their ecological compatibility. All manufacturers are beginning to stress the extent to which their products can be recycled while the aim of improved fuel efficiency is ever present and the thermodynamic limits are still some way off. The introduction of alternative fuels, such as hydrogen, and of the electric car still pose some awkward paradoxes concerning the energy efficiency and ecological compatibility of the entire system such changes would involve. However, recently more aggressive development of the electric automobile has produced some remarkable advances. For international personal mobility the situation may well change considerably as Videoconferencing and electronic communication, via fax, electronic mail and computer based conferencing become more widely available. Indeed, one of the enduring outcomes of the current recession may be the growth of these systems at the expense of international travel. The impetus will come from companies which have sought to reduce their travel budgets and improve their speed of communication in order to remain competitive, and in doing so have ‘resorted to’ Videoconferencing and electronic mail.

Many authors have explored ‘comprehensively’ the questions of IT and its role in transport, but throughout it should be remembered that in the end most current IT is concerned with maintaining the underlying philosophy of freedom of personal mobility to meet and socialise with other people. The human need for face-to-face interaction is unlikely to change much; IT can, however, make such meetings both more certain in their purpose, when that is necessary, and at the same time more purposeful and convivial, that much was clearly demonstrated in the early 1970s. The vision of utopian cites seems unlikely to bear any relationship to the role IT can play in assisting personal mobility in all its forms.

While there are many paradoxes that will need to be resolved, IT and personal mobility are not a contradiction in terms. What is more perturbing is the rash of publications that discuss as ‘new’ ideas that were brought to reality more than 20 years ago, ideas that Vannevar Bush anticipated during his time as Harry Truman’s scientific adviser as long ago as 1945! Reality is in many cases somewhat different, but to suppose that the age cohort to whom computers and communication are thought to be everyday tools, go on to grasp them with alacrity when they reach management positions, is turning out to be a fallacy. Maybe the management schools have something to learn about methods of management for the 21st. Century.

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1 See ‘Computers and You,’ Futures, December, 1983