The culture of connectedness

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Citation: LLOYD, M., 1994. The culture of connectedness. IDATER 1994 Conference, Loughborough: Loughborough University

Additional Information:

- This is a conference paper.

Metadata Record: [https://dspace.lboro.ac.uk/2134/1537](https://dspace.lboro.ac.uk/2134/1537)

Publisher: © Loughborough University

Please cite the published version.
The culture of connectedness

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Abstract
In the next 10 years it will be possible to place a billion transistors on a single microchip - representing a million fold rise in the cost effectiveness of information technology. The convergence of information and communication technologies is causing, and will continue to cause, widespread upheaval.

These changes are enabling the practice, teaching and learning of design to evolve rapidly and in new and exciting ways. What affects are these technological developments having on the practice of design and the design business? What are the implications for teaching and learning?

The Culture of Connectedness examines these questions and presents industrial and commercial case studies alongside identified educational opportunities.

Technology is about to “go around the foundations of society with a crowbar”. In the next 10 years it will be possible to place a billion transistors on a single microchip - representing a million fold rise in the cost effectiveness of information technology. Communication technologies have advanced to the point at which single strand of cable can carry all the calls placed in the US at the peak time of Mothers’ Day. The convergence of information and communication technologies will undoubtedly cause widespread upheaval.

As in the past, the adoption of new technology brings problems, threats and opportunities. Those with an understanding of these, and a vision of their role within the emerging Culture of Connectedness stand to prosper.

Prevailing economic conditions demand ever decreasing time cycles for ever increasing quality and cost-efficiency, and wider choice within an increasingly tight legal framework. For many people, understanding the data jungle causes immeasurable “information anxiety” and advances in technology are outstripping people’s ability to use it. In addition to this, there is a constant increase in the amounts of training and attendance at conferences needed to keep up with new developments.

Then there are threats. New technology creates new jobs - but always at the expense of others. Being involved in “mind work” is, in itself, no longer a guarantee of employment. For most of us who commute there is a wish for less commuting. We also want a cleaner environment and more time to spend with family and friends.

Services are rapidly developing to solve some of these problems. Virtuosi, for example, is a computer generated virtual environment, currently being developed by a consortium lead by BT and including Division and Nottingham University. This system allows the user to enter a virtual workspace that spans an entire organisation, via a desktop computer - from (in theory) any location. Once “in” the user can go about work in the same way as one would expect in a non-virtual situation, except that the person working “next” to you could be in a different time zone.

Beyond the virtual office is the virtual factory, being piloted with BICC Cables. Here, people can share expertise and make changes to processes in an industrial context.

Virtuosi is still under construction, but there are plenty of cases where converged information and communication technologies are being used to real
commercial advantage. The Ford Motor Company, for example, sees itself increasingly as an assembler of cars.

With 800 suppliers scattered globally, Ford needed a system that would improve the transfer of drawings and other information between themselves and external collaborators. A new system, Ford Net CDX, launched earlier this year, enables “Simultaneous Engineering” to take place through the extensive use of common software platforms and a networking tool called ISDN. Suppliers and Ford engineers now “share the geometry” of a vehicle in development where before, designers and engineers would finish drawings and pass them on. Ford Net CDX enables greater speed, accuracy and clarity in communication and is already paying dividends.

Beyond sharing files with external collaborators is the concept of “teleworking”, which involves working at a distance from an employer, and is part of a world-wide shift in the pattern of economic activity. There are currently between 0.5 and 1 million self-employed teleworkers in the UK doing work ranging from accountancy, diskjockeying, and design. Nearly half of the UK’s major companies are running pilot teleworking schemes and BT estimates that 2.5m people will be teleworking by end of 1995.

The advantages of teleworking are very clear: less time travelling to and from work, more time at home and more flexible working arrangements. For the employer, teleworking enables a reduction in business travel costs and a survey of 250 major UK organisations shows that all those employing teleworkers were seeing an average increase in productivity of 45% - as well as less time being taken off due to sickness.

Teleworking does, however, have a downside. Working at home introduces new pressures - especially if children are around. There are also questions about insurance and liability and many employers are reluctant to let employees telework because of a fear of losing control. In the creative professions, which “feed” on social interaction, loss of social contact is, understandably, a fear - as is the worry of turning into a computer bore! However, new forms of socialisation are resulting from network culture and those companies furthest down the teleworking road report that their teleworkers split their time between home and a more formal office environment.

The strongest argument in favour of teleworking is the ecological case. Commuting puts 2.4 billion gallons of exhaust gas into the atmosphere every work day in the UK alone, and it is unlikely that there are many people who actually enjoy sitting in gridlock.

There is a growing sense of an emerging workspace - one which exists in the memory of computers instead of inside office spaces. It is only when computers are linked via networks that the real power of new information technology is unleashed and the Internet now connects sources of information on a massive scale. There are now, or soon will be, 25 million users of the Internet and its population is growing by 150,000 a month. Internet access is available for as little as £10 a year and many teachers are making use of this rich resource.

The Internet is used in three main ways. The first is EMail, which is inexpensive and instant and, unlike fax, EMail messages can be cut and pasted once received. The second main use for the Internet is discussion, through “newsgroups”, and there are currently over 5,000 of these from out of body experience to the best way to clean an aquarium. Participating in newsgroups has been described as “taking part in the world’s largest conversation” or “being able to wander into a series of pubs that don’t close”.

The third main use of the Internet is retrieving and posting data. Millions of documents and files - text, sound, video, graphics and software - are placed in the public domain on the Internet and they cover
just about any subject known. A real advantage to using this type of system is that data is transferred at the price of a local phone call - regardless of the real location of the remote computer you are dealing with.

As one can imagine, the Internet - the ultimate information machine - could be a nightmare to navigate, but some useful tools are becoming available. The most interesting of these is “Mosaic”.

This new piece of software enables multimedia interaction with the World Wide Web, a network that sits on top of the Internet and comprises hundreds of globally dispersed “servers”. The system uses “hypermedia” objects, such as underlined text phrases or icons, that transports the user to other documents or sites when clicked on. This allows the Internet to be browsed and the browser to build up a “hyperdocument” of text and images, video and sound.

Using electronic networks enables small companies to be like big companies. Vogt & Weizenegger is a new two-man product design consultancy based in Berlin. In order to compete, they need to be able to take on the attributes of a large consultancy - with a wide spread of specialisms and skills and deep knowledgebases.

The use of telematics enables Vogt & Weizenegger to develop these attributes without having to go to the expense of using large offices and retaining a large staff. Another advantage that telematics brings Vogt and Weizenegger is that information, skills and their service collaborators are constantly updatable and can be widely geographically dispersed.

There is an almost endless list of opportunities resulting from the convergence of information and communication technologies. Fibre optic cables, currently proliferating the Western World, for example, will replace air as a medium for mass communication and personal narrowcasting “TV” stations are a real possibility. Even at this point in time it is possible for just about anyone with a computer, modem and telephone line to become an on-line service or information provider.

The future role of the designer is also likely to change with technological progress. Niels Peter Flint, of O2 Global Network, talks about the future role of the designer becoming that of a catalyst for change: organising the creative process, developing concepts and working with teams of specialists. With the convergence of information and communication technologies it is no longer what you know but it is how you ask the questions.

New technology can enable those involved in the development of new products to work more closely with the end user. Consumers, networked and using interactive technologies, could shape new products, buildings and services - in real-time. Interactive product development seems to be a logical extension of interactive, home-based shopping.

The rapid formation, and disbandment, of specialist or multi-disciplinary teams on a global basis is increasingly desirable. “It’s about asking what needs to happen, who are the five best people on the face of the earth to make it happen and how do we bring them together to do it?” says one advertising executive who uses telematics.

In theory, electronic networking can take place on a truly global basis as it is now possible to set up a data link, or telecottage just about anywhere on the surface of the Earth.

One of the biggest current creative challenges is to integrate ecological thinking into the “manmade” world. O2 Global Network has been quick to realise the potential of telematics in its quest to clean up design and has recently launched its own World Wide Web site. Further opportunities exist for involving the developing world and the physically handicapped in the global economy. Education,
too, stands to benefit enormously. Imagine pupils and students being about to make virtual visits to virtual labs, factories and utilities. Text books, chalk and talk are as relevant to education now as the ink quill and dunce’s hat.

Perhaps the most exciting prospect for the design world is the task of designing virtual, or “cyber”, space itself. As virtual becomes reality, design questions are being asked: how will cyberspace be structured; what will it look and feel like; how should people interact with it?

O2 Home Page on their WWW “shopfront”. Browsers, using Mosaic (above), can click on graphics or highlighted text to get the latest eco-design information from O2.

There are some real moves afoot to develop cyber workspaces for designers. Demands for increasingly fast responses in the fashion industry, for example, has lead to the development of a networked multimedia database, at Nottingham Trent University, as part of the Virtuosi project. Designers, buyers, manufactures and suppliers are all connected to the “Fashion Intelligence Navigation System” and companies can ‘dial in’ for access to pictorial databases, fashion trend data, lists of suppliers of fabrics, articles and market assessments. A central CAD/CAM system provides printing and plotting, scanning and video capture, archive illustrations, fabric swatches, and computer animation including 3D fashion shows. When the designer has finished the virtual design, the resulting garments can be “fitted” to a virtual model and sent down the catwalk - in front of a geographically dispersed audience.

While Fashion Intelligence Navigation System addresses the fashion industry, and has a UK focus, “TESSE” has a multi-disciplinary scope and operates in the European context. TESSE is a set of service models under development which will eventually become an integrated networked service - to all aspects of the design community in Europe. This EC backed project is based on network construction among small enterprises and plans to provide online services ranging from cross border banking, technical databases, legal and patent services to teleconferenced education programmes.

A fundamental principle behind TESSE is that the human aspect of the technology adoption and use of new technology is of far greater importance than the technology itself - there is a cultural challenge to be faced by those who wish to move forward in this direction. This challenge is for individuals and organisations to see themselves as part of the “data stream”. As Tom Peters says, “the new corporations - virtual corporations - will appear edgeless with continually changing interfaces between company, supplier and customers.”

By the turn of the century the world’s knowledgebase will double every 70 days and no one doubts that the convergence of information and communication technologies will cause further change in an already rapidly changing world. The idea of “network as computer” is already well established. In the time taken to read this article around 50 more people would have joined the Internet and will soon experience the power of a brave new workspace.

The message for those wishing to stay in front in the information race is now loud and clear: “don’t work - network”.

This paper is based on a talk given at the Second Aslib (Association for Information Management) Consultancy Briefing, Cavendish Conference Centre, London W1, May 9th 1994.