<u>Quaquaversal,</u>

<u>A Post Mass Card</u>
<u>From a Flexible Future.</u>

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"We instinctively wave to people on trains because trains are a metaphor for being alive; countless souls, trapped together, hurtling across the landscape, with a destination somewhere in the unseeable distance.
Nobody ever waves at buses."
"Polaroids from the dead" by Douglas Coupland.

"The planet has already been militarised, digitised. We are all on the front line."
"Visiting Mrs Nabokov" by Martin Amis.

Contents.

Contemporary global culture is constantly reformed by events that independently can be impressive or mundane but when correlated have subtle and fantastic implications. This essay explores the near future implications of some emergent technologies and their relationship with culture.

In five years time this technology will enable a distribution network to deliver millions of physical packets world wide within a few of days. The total operation tracked and managed over the Internet. This network with others will carry voice and data and will be satellite based, mobile, cheap, fast and truly global. For fixed base and bulk data the optical net will serve the urban clusters with the potential to carry our whole digital history in minutes. To process and manage this proliferation of digital information computers will be fast and cheap. To make the interaction with this processing power and data more accessible Television will come of age, displays will be big and slim, interfaces talk and touch in any language. Complex programs will have 'intelligent assistance' and be spatially and photographic realistic. Metal, plastic and rubberised mouldings will be quickly and flexibly produced at a main stream price.

In ten years time it will be possible to convert the optical data net into a power and data optical net, transmitting power, world wide down cheap, safe fibre. This development in turn facilitating the emergence of the new optical processors, moving the transient data based products into the realm of permanent intuitive objects.

Like a postcard this essay has, strictly speaking no start, middle or end. It is a collection of information, which can be sampled at any point. But reading the whole of the text, page for page will give an over all picture of the technology and the interesting and unexpected results it has on the way we live, design, shop and relate as individuals to main stream culture.

<u>Introducing Salon Culture.</u>

Waves.

A really interesting look at mass production comes from Alvin Toffler. "As the Second Wave (Industrial Revolution) moved across various societies it touched off a bloody, protracted war between the defenders of the agricultural past (First Wave) and the partisans of the industrial future. The forces of First and Second Wave collided head on, brushing aside, often decimating, the primitive peoples encountered along the way.

In the United States, this collision began with the arrival of the Europeans bent on establishing an agricultural, First Wave civilisation. A white agricultural tide pushed relentlessly westward, dispossessing the Indian, depositing farms and agricultural villages farther and farther toward the Pacific.

But hard on the heels of the farmers came the earliest industrialises as well, agents of the Second Wave future. Factories and cities began to spring up in New England and the mid Atlantic states. By the middle of the nineteenth century, the Northeast had a rapidly growing industrial sector producing firearms, watches, farm implements, textiles, sewing machines, and other goods, while the rest of the continent was still ruled by the agricultural interests. Economic and social tensions between the First Wave and Second Wave forces grew in intensity until 1861, when they broke into armed violence.

The Civil War was not fought exclusively, as it seemed to many, over the moral issue of slavery or such narrow economic issues as tariffs. It was fought over a much larger question: would the rich new continent be ruled by farmers or industrialists, by the forces of the First Wave or the Second. Would the future American society be basically agricultural or industrial? When the Northern armies won, the die was cast. The industrialisation of the United States was assured. From that time on, in economics, in politics, in social and cultural life, agriculture was in retreat, industry ascendant. The First Wave ebbed as the Second came thundering in." Taken from "The Third Wave" by Alvin Toffler.

"Today, the line up of world civilisations is different. We are speeding towards a totally different structure of power that will create not a world cut in two but sharply divided into three contrasting and competing civilisations – the first still symbolised by the hoe, the second by the assembly line, and the third by the computer.

In this trisected world the First Wave sector supplies agricultural and mineral resources, the Second Wave sector provides cheap labour and does the mass production, and a rapidly expanding Third wave sector rises to dominance based on the new ways in which it creates and exploits knowledge.

Third Wave nations sell information and innovation, management, culture and pop culture, advanced technology, software, education, training, medical care and financial and other services to the world. One of these services might well also turn out to be military protection based on it's command of superior Third Wave forces. That is, in effect, what the High Tech nations provided for Kuwait and Saudia Arabia in the Gulf War." A Third Wave information based military force defeating the larger massed might of a Second Wave supplied military machine. Taken from "Creating a New Civilisation" by Alvin Toffler.

Paper Back Writer.

"For information to be communicated broadly, it needs to be stored external to human memory. Knowledge and learning would be severely limited without such storage, making necessary the development of writing systems." A useful model to follow to understand the history of production is the development of the written or recorded word. 'Books' are already post mass produced, this essay is a flexibly manufactured product.

One off Production of the written word was done in many ways, one of the earliest being "the Sumerian cuneiform, a wedge-shaped writing system, which was impressed by a stylus into soft clay tablets, which were subsequently hardened by drying in the sun or the oven". "At some point in the evolution of written languages, the method of representation shifted from the pictographic to the phonetic" this greatly facilitated the batch production and ultimately the mass production of text. "Johannes Gutenberg is generally credited with bringing together in about 1450 the two ideas that constituted the invention of modern printing. The use of dies to make individual pieces of type that could be assembled as required and then reused, and the use of a press by which sharp impressions could be made many times over, on both sides of a sheet of paper if desired."

Batch production of text shifted to the typewriter. "The first practical version, constructed by the American inventor Christopher Latham Sholes, not appearing until 1867. The mechanical typewriter finally found wide use after World War I pervasively to record original text." Taken from the Britannica CD 98.

These processes are still basically the same but original content is now stored and mass or flexibly produced digitally. The current ultimate from of production could be flexible digital manufacturing. This is the making of a finite number of individual virtual objects from a highly adaptable parent virtual object using process dedicated tooling for the manufacture of the bytes. An example would be an individualised newspaper.

Pedal Empowered.

Current mass production techniques provide the best build quality available. Wishing to maintain the quality main stream consumers can only customise excising designs in simplistic finish or feature option methods. When purchasing a bike in Milan I had a list of requirements. The first being some English spoken, the second price, the third ride quality and the fourth image. For my 200,000 Lire I had a choice of two sizes, one style, three colours, five locks, one language (Italian). I purchased a patent black and chrome bike called Cortina designed in the Fifties, so the pedal fell off after three weeks.

Drivers License.

A project which illustrates the rise of the empowered consumer and which I was personally involved in was the refit of the Driver and Vehicle Licensing Agency (DVLA) offices in Swansea, South Wales.

Christine Irving who is the Accommodation Officer, for the DVLA required a desk system that satisfied a list of requirements that she had developed with all the managers at the DVLA.

She had asked a few large office furniture suppliers to submit tenders based on her requirements. Although she was effectively spending several million pounds on this project most of the manufacturers she approached ignored her requests and demonstrated standard product from their price lists.

Initially this included Flexiform, the company I was designing for and the contact went to another supplier. "Unfortunately we became dissatisfied with the product for value for money reasons." Explains Christine, "We therefor returned to Flexiform who had a range which met all our requirements except that of the flexibility provided by the workstation. Thus began the liason which produced the new workstation." I was appointed as Project Designer and was allowed to spend the few thousand pounds to develop and build a prototype desk system to try and match Christines list of requirements.

In this way we worked together and I acted as the interface between her exacting requirement and a mass-produced desk system design, which already excised. The final concept utilised many common mass-produced components but retained the original object language and many of the desk system features. The project began two years ago and the desk system design managed by Christine is still be made and installed along side its standard parent product which is now also purchased.

What is interesting about this example is that the consumer and producers have to go through several distinct stages. These start with the consumer's overview of the requirement and available mass-produced solutions. This is developed towards the establishment of a specific requirement and several potential producers. Followed by the rigorous selection of potential producers from their corporate image, philosophy, customer care and portfolios. As Christine states "Obviously as we have a specific requirement due to the nature of our work and the high demands of our staff it is very important to be able to control the manufacturing flexibility through the project design interface". A failure of this element could potentially loose the contract for the producer at several stages the worse being right at the end when they produce a lot of expensive junk. Finally the choice of consumer - producer relationship is made and the contract is signed and the product is produced.

Amazingly Christine's purchasing power had to force this niche market to exist profitably. Although manufactures are slowly allowing themselves to move towards the empowered consumer scenario many still seem to remain disinterested with large investments in inflexible product design and manufacturing plant. Thanks to Christine Irving, Accommodation Officer, DVLA, Morriston, Swansea, South Wales.

Industrial Leapfrog.

People in agricultural (First Wave) based civilisations generally "consume what they themselves produce. They are neither producers nor consumers in the usual sense. They are instead what we might call 'prosumers'. It was the Second Wave (Industrial Revolution) driving a wedge into society, that separated these two functions, thereby giving birth to we now call producers and consumers."

"More than once we have seen naive attempts to 'develop' a basically First Wave country by imposing on it highly incongruous Second Wave forms – mass production, mass media, factory style education." This is "without recognising that for these to

operate successfully, traditional family and marriage customs, religion, and the role structures would all have to be crushed, the entire culture ripped up by its roots.

By astonishing contrast, information based (Third Wave) civilisation turns out to have many features – decentralised production, appropriate scale, renewable energy, de-urbanisation, work in the home, high levels of prosumption, to name just a few, that actually resemble those found in First Wave societies." "What is striking today is that First Wave and Third Wave civilisations seem likely to have more in common with each other than with Second Wave civilisation. Will this strange congruity make it possible for many of today's First Wave countries" to introduce Third Wave structures more easily "than to industrialise in the classical manner." Taken from "The Third Wave" by Alvin Toffler.

Package tour.

Federal Express (FedEx) has developed and is expanding a large distribution network, which is "a fast, reliable, door to door customs cleared express delivery service for documents and packages to over 211 countries world-wide." They have digitised their operation in order to deal with "over two million customers a day". Most services are over night and if you are quick enough you can use their Internet site to redirect your package to another destination. I got a quote from the site to send a package from the United Kingdom to Kyrgyzstan, which sounded fairly remote. Provided it was delivered to a main city it would take "five business days". http://www.fedex.com/ "Tools for Shipping" 02-02-1998.

Data Line.

Another global network, the Internet still runs on the operating system created by the United States Military. This basically piggybacks on the world phone system, which unless you are specially connected, has a maximum capacity for data transfer of 0.56 Million bytes per second (Mbps). The existing phone based Internet is managed by a large number of "Service Providers". In 2002 one of these new providers will be Teledesic. This is a company financed by billionaires Bill Gates, Craig McCaw and aerospace company Boeing and is the super fast "Internet in the Sky". Teledesic is a network of 288 non-geostationary low Earth orbit (LEO) satellites, which will give complete high speed Internet coverage of the globe. They promise to deliver 64 Mbps to anybody anywhere in the world from anybody else anywhere in the world. This means the complete body of this text could be sent to you in a 747 jet over the Pacific

five hundred times in one second from my studio in London. The promised cost of transference will be comparatively very cheap because of the speed, compressed VHS quality 1.2 Mbps "Gone with the Wind" could be down loaded in under four minutes. Loading an application such as a standard 3D solid modeller from a remote site would take two seconds.

The publicity for Teledesic is very visionary and contains these statements; "Today, advanced telecommunications infrastructure is limited to the developed urban areas of the world. This leaves most of the world's population without access to even basic communications services. Even those areas with basic voice services get access through 100-year-old technology; analogue copper networks that for the overwhelming part will never be upgraded to support digital, broadband services."

"On day one of service, Teledesic will enable broadband telecommunications access for businesses, schools and individuals everywhere on the planet." Its "Internet in the sky is an inherently egalitarian technology." It "will help transform the economics of telecommunications to enable universal access to the Internet and the information age." Taken from http://www.teledesic.com/, Teledesic Overview, 28-01-1998.

As the airborne digital traffic rises the global optical and sky networks will start to drop their costs and eventually transfer information for free, the owner companies generating revenue from the trillions of daily downloads and standing charges. Bill Joy of Sun Microsystems, interviewed in Wired August 1998, "One Huge Computer". "What comes after cheap chips and mobile bandwidth? The next step after cheap is free, and after free is disposable."

There are five other LEO services currently being built these will provide totally global mobile paging and telephone services all going on line in circa 2002.

Teledesic's first phase is costing $9 billion and Motorola's $13 billion. Potential profits must be driving the move towards this kind of global communications market but the dependant culture that will simultaneously develop will very quickly outstrip the physically available bandwidth.

Some years ago the "Negroponte switch" predicted an event were "the information currently coming through the ground" in "wires, will come in the future through the ether and the reverse. Namely, what is in the air will go into the ground and what is in the ground will go into the air." Negroponte goes on to say "We must be willing to live in predetermined parts of the spectrum, and we cannot use the ether piggishly. We must use it as efficiently as possible. Unlike fibre, we cannot manufacture any

more of it. Nature did that once" and "in the end we ought to save all the spectrum we have for communication with things that move, which cannot be tethered, like a plane, boat, car, "train," briefcase, or wristwatch."

This switch will take place firstly in the developed world were demand and fibre infrastructure are already in place. The third world will develop their networks differently, developing demand on the satellite networks and then going straight for fibre as it (Negroponte again) "is cheaper than copper, including the cost of the electronics at each end. If you come across a condition where this is not true, wait a few months, as the prices of fibre connectors, switches and transducers are plummeting. With the exception of communications lines a few feet or yards long or the presence of unskilled installers, there is no reason to use copper in telecommunications today (especially if you include the maintenance cost). The Chinese are using fibre for a totally different reason; the villagers dig up the copper to sell on the black market. The only real advantage of copper is the ability to deliver power." The size of the fibre network is gigantic. Negroponte points out that "we literally do not know how many bits we can send down a fibre. Recent research results indicate that we are close to being able to deliver 1,000 billion bits per second" Taken from "Being Digital" by Nicholas Negroponte and background on fibre networks from http://www.quest.com/ "SuperNet" 05-06-1998

World Power.

Following up a conversation with Dr Keith Franklin of British Nuclear Fuels Ltd concerning power transmission and fibre optics I contacted Professor Terry King, Head of Photonics Research at the University of Manchester.

I visited the laboratories and Professor King began his introduction to photonics by explaining that "In ten years it will be possible to build a network for power and data, which would be completely fibre optic. The national grid would power the main lasers and the optical net would run through out the building and into the city. Power would come from a large laser source and data from several smaller lasers, but all would travel down the one fibre."

I was then shown power transmission through a fibre optic cable and Professor King attempted to explain that "It's possible to transmit power, a 50 watt light bulb can be powered from a 5 watt laser. We have focused laser light and transmitted 100 kilowatts of energy into a 10 micron square."

I asked about a totally photonic system referencing an article http://www.cyberdyne-computers.com/ "What is Photonic computing?" 07-05-1998. The article says "Interference based Photonic Transistors work! and we are continuing to make rapid progress towards the goal of replacing nearly all electronics with photonics on a global scale." Professor King explained "Currently completely functioning photonic computers are proving difficult. Light controlling light. Using one laser light as a controller of a second laser light. Switching it on and off to create logic gates. That has been done successfully. A fully operational light speed computer is just a matter of time."

Professor King then showed me a photonic molecular clamp for nano construction and a transparent 2 cm square one hundred gigabyte hard drive. I had to go home. Thanks to Professor Terry King at the University of Manchester 02-07-1998.

Processed 3Ds.

There is a ceiling for processor speed based on the wave length of light used in the production process. This limit is almost reached and I've read in several articles that IBM and Intel have both announced the release of a commercially available 1000 MHz (1 GHz) Central Processing Unit (CPU) microchip for the year 2000. The current mainstream top speed for a CPU is 450 MHz. This could mean a standardisation of processors and more reliance other hardware and quality programs. These predicted speeds would enable real time visualisation of relatively complex 3D model manipulation. Currently simple rendering is employed during the manipulation process whilst full visualisation is only available at finalisation. This would allow interfaces to be as good as their designers wanted without having to consider the limits of the lowest common denominator computer which might be using it.

Touch Plasma.

"The market for colour plasma display panels (PDP) has entered a new era. Performance, size and costs of colour plasma displays can now justify billions of dollars of investment." "Fujitsu has now taken the lead" with "products available in production quantities." "The new device," which "is under $5,800" and "features a 42 inch diagonal screen (920 mm wide x 518 mm high) that is just 75 mm thick."

Taken from http://www.fujitsumicro.com/products/fpd "Flat Panel Displays" 28-01-1998.

The PDP is available with a touch sensitive surface allowing input independent of a mouse or keyboard. I tried this interface for using a paint box program at the Cologne

Mesa recently. Drawing a fairly large picture with your finger in full colour with crazy effects. It was fantastic. Most of the show was office furniture, a lot designed for the big cathode ray tube type monitors and confidently sitting in the corner was the monitor which was the desk as well.

Talk of Babel

Another demonstration that didn't try because I was too scared was ViaVoice. Where I saw this program it was only in Italian but it seemed that finally computers can recognise speech and dictating text is no longer a problem. "You talk, it types." Taken from http://www.ibm.com/viavoice 23-07-1998. My sister tells me that she is using ViaVoice to help her learn to type?

A lot more impressive, because I find it very difficult is the translator worked out by a group of language and programming experts. A common set of deconstruction rules is applied to a written language reducing it to a pile of numbers. The same numbers are then reconstructed into another language. What I find funny is I haven't seen the "Languages are no longer a problem" headline. This can be tried out at http://www.babelfish.altavista.digital.com. Taken from Wired May 1998 "Online Interpreter". ViA Inc's wearable, bendable motherboard was reviewed in Wired April 1998. "The belt is designed for NATO troops parachuting into Bosnia. The outfit includes headphones, microphone and software for translating English into Croatian, French, Russian, or any other language that might prove useful in a war zone. All I need is a loudspeaker to turn me into a fully fluent Tower of Babel. Later this year, when the system is capable of translating Croatian into English, I'll be able to strap the entire United Nations staff onto my hip for about $5,000. Voice activated machines are a lot smarter than they used to be, and it takes relatively little time to get this computer to whisper in my ear the Croatian translations for 'Destroy booby traps,' 'Deploy mine sweeper,' 'Hands up,' and 'freeze!' On the other hand, the computer isn't programmed to recognise other English phrases. For 'I love you' it says 'I do not know' and for 'You are beautiful' it says 'Put the pieces together and tighten them'." Taken from Wired April 1998 "Dress Code".

No more Television.

There is a big discussion going on in America about the future of television. Everyone, not just main stream culture understands the language of the television set and this is universally understood as the vehicle for the next omnipresent interface. "In America only 20 million homes have computers with modems. Some 68 million

have cable television." "Microsoft's real focus is the set top box, the noisome little gadget that serves as a halfway house for the signals coming into your television set, and they are not alone in their interest." Taken Wired April 1998 "The television space race".

"There is no television set industry in the future. It is nothing more or less than a computer industry; displays filled with tons of memory and lots of processing power. Some of those computer products may be ones with which you are more likely to have a ten foot, rather than an eighteen inch experience, more often in a group than as an individual. But any way you look at it, it's still a computer." Being Digital by Nicholas Negroponte.

Megastar

Following up the "television is dead, long live television" theme I ending up swimming in Lake Geneva with Paul Wood, the Assistant Editor of new media for Express Newspapers. Paul speculated that Newspapers are on a limited life span, they're too closely linked to manufacturing and not digital enough. He also explained the convergence of media. "The parent company of Express Newspapers, UMN has considerable media interests including newspapers and television. It realises that the Internet will be a very important aspect to its future business strategy in an age of media convergence, where original content will be all important. With the launch of digital television (DTV) and the explosion in available channels most of which will compete in niche markets, there will be a convergence between the Internet and TV, whereby the Internet will provide an additional service of contextual information complementing traditional TV. There has been many column inches appearing recently urging newspapers not to squander resources on Internet products when they would do better using the money to further improve editorial content. My view is that most newspaper owners have realised that the shrinking newspaper market will not be reversed, so better to harness excising editorial into digital products that can underpin or contextualise future mass media products as DTV Internet develops. Megastar is one of the few Internet brands making money. The whole Internet is financed on potential, money being positioned ready for the explosion, which potentially occurs with media convergence." Paul and I discussed if the Megastar was international, "The site is primarily for British Lad culture. Not very international, but I've been looking at Vector based graphics. These are being developed to cut out big graphics

files. This could also be used for real time translation of graphics on multilingual sites. The browser would be set with your mother tongue and translates text and text based graphics as you download. Let's export some Lad culture." Thanks to Paul Wood, at http://www.megastar.co.uk. 13-08-1998.

Second Guessed.

A couple of years ago at Centrepoint studio in Bradford, Saleem Lumb demonstrated a program called Catia for me. Saleem is now a Design Engineer at Audi and so I went to visit him and try out the latest version. Saleem described the process of modelling a prototype car. "We use several modellers but Catia is the all round 3D modeller that we construct the whole car in. We receive a 'Strak' or skin from the stylists and build in from that. We build a complete 3D assemblies of say a door and then each individual component can be isolated and sent to which ever computer numerically controlled (CNC) machine it was intended for. During the build in the computer, the program creates an editable tree, which can be accessed at any point at a later date. An example would be to construct a table, set the overall length to be 1500 mm. At a later date you could go back to the part of the tree where you fixed the length and change it. All the branches further out from this point would also alter with problems highlighted by the program. Catia's reliability, open architecture and editable construction tree have made it very popular with big companies like Audi, but it is still a specialist program. Catia has supposedly an anticipation function which works whilst you sketch in three dimensions guessing what you want to do next. When you have roughed out a shape, the 3D object can then be made accurate by selection and the dialogue box entry of dimensions. I don't know how good it is, I don't know where you turn it on." Thanks to Saleem Lumb at IVM Engineering, Audi, Ingolstadt, South Germany, 23-08-1998.

Model Agency.

Flexible manufacturing has been around for a long time in various forms but recent CNC advances and the introduction of advanced thermal reacting materials has pushed the technology into interesting new areas. DTM Corporation has developed the Selective Laser Sintering process (SLS). "The SLS process, used in DTM's Sinterstation ® systems, creates solid three dimensional objects by fusing powered materials with a carbon dioxide laser. This powder based technology is largely responsible for the multiple application capability of the SLS process. By coating particles with thermal binders, a whole variety of materials can be used. The powder

can offer several other key advantages over resin based technologies as well, including high yields and faster post finishing." "Firstly three dimensional CAD data must be output in the industry standard STL format." A "layer of heat fusible powder is deposited in the part build chamber. An initial cross section of the object under fabrication is selectively drawn on the layer of powder by heat generating carbon dioxide laser. The interaction of the beam with the powder elevates the temperature to the point of melting, infusing the powder particles and forming a solid mass. The intensity of the laser beam is modulated to melt the powder only in areas defined by the objects design geometry. An additional layer of powder is deposited via a roller mechanism on top of the previously scanned layer. The process is repeated, with each layer fusing to the layer below it. Successive layers of powder are deposited and the process is repeated until the part is complete. After processing the part is removed from the build chamber and the loose powder falls away."

There are "nine materials currently available, including polycarbonate, four nylons, metal, sand and more." These can be used to "directly create parts for building functional" "assemblies that can be powered and tested under working conditions." http://www.dtm-corp.com "The SLS Process" 02-02-1998.

DTM always refer cautiously to the finish parts produced by SLS as functioning models. The technology cannot yet use materials with the same resilience properties as moulded components. NASA are pushing research carried out with SLS and offer a comprehensive mail order service for making components modelled in 3D and sent over the Internet. "Why Is NASA Into Rapid Prototyping "and SLS? "Just like everyone, NASA is always looking for better ways to accomplish our goals. With diminishing budgets and increasing requirements, we hope that RP will wedge us into that better, cheaper, faster curve that the government is trying to conform to. The processes are already proving to be cheaper and faster, and out goal is to make them better through materials research and development." http://nasarp.msfc.nasa.gov/rp_home "NASA Rapid Prototyping" 02-02-1998.

Digital Objection.

Digital traffic on the new optical and sky based Internet will have little size restriction. This system will potentially absorb all transient technological objects. To list some of these objects gives a decent definition to "transient technological object". They are televisions, radios, telephones, computers, printers, watches, money, pagers, compact discs, calendars, tapes, books, videos, calculators, photographs, message,

promotional literature. The system in its current disparate way already contains many virtual 'objects'. Such as computer based games, programs, and encyclopaedias. Media based cartoons, news programs, and advertisements. Internet based libraries, universities and virtual worlds. I enjoy going past the new and very expensive British Library in London and thinking "Hi, transient technological object."

Look round the space that you are in, and what you have with you. How many of the objects are permanent and would remain if all the transients where removed. In most human environments there wouldn't be much left.

As you could imagine all the transient objects will be available as downloads. "I recommend downloading "Voyager", I think it's directed by Wim Wenders. It's a really beautiful movie. Perhaps we could watch it tonight, I don't mind seeing it again." The Saturday Night Fever soundtrack in two seconds, Mastercard accepted. Computer programs could be rented by the minute, virtual worlds explored by the hour. Every morning download the news and listen whilst you travel to work, or learn to speak Dolphin.

Each individual could bank their data at a personal file store protected by encryption where they would rent space for storing loads of junk. Remote sites could be insured and be safe from fire and theft, just like the bank.

Easy Money.

One of the more conceptual digital transient technological objects is money. Although it's been around for a few years money is one of the most popular converts to the virtual world. Mondex, one of the world leaders in digitising money has been testing their systems in a large number of cities worldwide. Mondex works by encrypting digital money with a serial number. Whenever this money changes hands the central database authenticates the transaction. Any anomalies are frozen and the whole system "shakes hands" to introduce new security measures. Taken from http://www.mondex.com/ "The History of Money" 11-05-1997. Mondex quote the total of world daily transactions as circa $17 billion, $14 billion of which is in cash. Visa Cash offer a complementary system to the audited Mondex method because they see the popularity of anonymous transactions. Visacash is loaded onto a smartcard from your account. This electronic money can now be spent by anyone in possession of the smartcard. "Its fast, convenient and easy!" Taken from http://www.visa.com/ "Visa Cash" 11-05-1997.

Digital Democracy. Demogital?

Hazel Henderson has recognised that the emerging technologies empower people in many ways to achieve their aims. "Party politics has been pre-empted by mass media and we must develop a political system based on an organic, biological model where there is greater access to the wisdom and creativity of all our citizens, not only the elite groups which tend to become dangerous and insulated from various aspects of reality." She is advocating a digital voting system, which formalises the "politics by other means, non governmental organisations" methods favoured by many who can't find expression in the political system and that "we use our technology to create a truly participatory democracy". Utilising the global network, Hazel Henderson proposes a system, which turns the political machine literally up side down and politicians will simply make proposals and administer the responses generated by the "democracy feedback". Hazel Henderson proposes a further amendment to the constitution with "Laws should be passed forbidding anyone to deny the citizen access to a computer terminal" linked to the global network. The right to bear arms replaced with freedom of digital speech. Taken from http://www.auburn.edu/tann/hazel "Perfecting Democracy's Tools" 02-05-1998

Perpetual Motion.

A Nomadic life style would be so easy under a digital sky. Every one who is important to you seemingly available all the time, your information work carried out anywhere on global dumb terminals, with your pay always available. Middle class ease anywhere you go. Whilst writing this essay, I have used over two thousand phone units. I don't know how much a unit costs, and it's easy to find out.

Most cultures revere objects, how will we react to the sudden loss of so many transient but familiar objects. There is still a great desire for culturally rich objects, many of these will be technological replacements.

Currently software control is very difficult and operates more on an honesty system. Counter measures include physical "dongles", objects that contain a microchip and fix onto the computer and give permission to the software to run. No dongle and the program won't operate. The other popular method is an encrypted serial number, which has to be entered when the program is first run. Both these methods are usually cracked within two months of the new software being launched. The super fast global net will allow software to be temporarily downloaded onto the customer's computer and after a set period of time this will automatically delete. This will also allow

software houses to constantly update their product and slow release programs cutting out the a large part of the testing program as minor bugs can be sorted out at a later stage. This is flawed only when you isolate the program from the global net and the cracked life span is immortalised. Combination systems could prove the most successful, encrypted dongles with sophisticated and metamorphic identities act as the gateway to the global net. The start up of the program is acquired and any modules, such as printing are loaded for single use when required. Instead of the multiple buying of a short life span virtual object you would single purchase a physical dongle. This would be similar to the mondex system of greater control, digital and physical intrinsically linked. So ironically software companies may want to retain a more permanent form of transient object, as they provide a physical node of reference in a fast moving digital landscape.

Other transients from the global net will be reborn in more permanent form. Emerging in new, lighter and more culturally significant ways. In many ways there will be nothing new to design in the technological domestic landscape, all new developments will exist digitally and strictly speaking will require no form. All the transients will be gone leaving the age old permanents. A rug is a permanent and a digital rug would be a rebirth permanent.

My Internet Radio project explored the potential of the product to represent through its object language the 'philosophy' of a specific Internet radio station. Strangely enough I based my radio station on the project sponsor "XFM" in London. The final object was a folded over thin surface containing only a microchip, a speaker, a volume control and an RJ45 male network connector. The object connected to the building network and through to the global net. In the object was stored the Internet address of the radio station http://www.xfm.com/. All the other technology currently associated with a radio remained in the global net.

Another similar project sponsored by "BT" in London, gave a physical and familiar form to a personal file and financial account access dongle. The 'wallet' also carried Visacash, which could be spent as part of the anonymous system.

These examples showed that non-perceivable digital information such as an Internet radio broadcast or hard currency is possibly better understood and appreciated when represented by a perceivable and culturally referenced object. Culturally rich object as technological interface.

These rebirth concepts would herald an explosion of objects, which are a Graphic and Industrial Design cross over. Compact discs, which currently are all, based on a specific format will be manufactured as individual forms. Go to the "Grateful Dead" site and purchase the "Limited edition dongle, of Jerry Garcia's 1991 interview, in the form of Charles Manson's bust." Also available as one of seven thousand other "Grateful Dead" memorabilia forms.

Couch Surfer.

I think Dyslexia runs in my family, on my Mum's side. My Dad would say that I'm just lazy. Either way spell check is eccential > essential and so whilst in Milano planning this essay I looked around on a Café Internet for a computer. The cheapest laptop I could find was from Centro HL and they had a shop on Via Solaria, just round the corner. I went round to have a look at the laptop I had convinced myself I needed. In the shop was a woman at a desk with a computer connected to the Internet. The only other people in the shop where the two ubiquitous nerd teenage lads. I asked about purchasing a laptop. This immediately attracted the attention of the nerds and the four of us spent a really brilliant half an hour in our best Ingliano choosing the best laptop. The computer was ordered over the Internet to be delivered to the shop. The assistant explained that the reason Centro HL was so cheap was exactly for this reason. I loved this shopping expedition. It was fun. The whole thing would have been more than perfect if the shop had been a bit more like "Home", a London bar full of sofas.

New Jeans.

The next step in digital shopping is prosumerism. An interesting example of which comes from the clothing industry. These manufacturers have never been fully able to mass produce anything. Costs have mainly been brought down by standardisation of product range and strict working practice. "Last year, Levi's successfully launched Personal Pair Jeans, the customer punches their details in to an in store computer and 21 days later, gets a custom made pair of Levi's." The material is CNC laser cut and stitched traditionally. Taken from "The Shopping Forecast" by Annalisa Barbieri, Vogue, 20-04-1998.

Whilst having lunch at Max Mara, with Daniela Zobbi she explained to me their production. "We are a very large manufacturer of 'Pret a Porte' classic clothes. Our factory supplies our 20 stores and 500 licensee outlets in Italy as well as the other 100 world wide stores and licensee outlets, such as London, Paris and Japan. The factory

mass produces our range which changes a lot and is always very large. The pieces are cut out in large numbers and some parts, like a trouser seam are automatically stitched together without an operator. A machinist then finishes the rest of the garment. Sometimes the fabric and the clothes are hand finished with brushing or detailed stitching. In the stores you try on say, your skirt, and we have women who raise the length or bring in the tuck for you. We have not experimented with made to measure, like Levi's. Max Mara clothes are very complicated, the shoulders have lots of pieces and our stylists spend a lot of time on the form. Jeans are easy in comparison." The clothing industry is mass manufacturing's last in, and will be its first out. Thanks to Daniela Zobbi at Max Mara, Reggio Emilia in Italy, 27-08-1998.

School Trip

Whist visiting Reebok headquarters in Boston with the college I was shown round the design and prototype facilities by the Head of Design Education Steve Weston. He ran through the process Reebok go through when launching a new trainer product. The usual market studies and design evaluation processes are conducted, generally by a small team, which keeps the design and development costs to a minimum. Mock ups of the new trainer are made in house, mainly by hand with moulded parts modelled using soft tooling. When a design is finalised it is put out to production. This generally involves the creation of all the sizes and half sizes. The total number of tools coming to about twenty-two paired mouldings. Steve Weston estimated the cost of all these tools to be more than $½ million. Additional to the injection moulding tools are the pattern cutters for each pair of trainers, each pair having at least twenty. Each tool has to be worked out, drawn up, made and proven before Reebok can launch the new product. Steve Weston estimated that it must cost nearly a million dollars to bring a new shoe to the market place. This figure didn't include the advertising costs, which must vary according to product.

The main reason for trip out to Boston was to present our projects, loosely based on the body to the directors of Reebok. I thought I would amaze them with the new technologies particularly SLS and proposed that they adopt the following model.

"Reebok will start to offer, over the Internet niche market products that can have sizes and colour ways manipulated by the on-line customer using special intuitive and intelligent 3d modelling software. Once the product specification is finalised the modifications to the original 3D model are sent over the global high-speed digital network back to Reebok. The master program strips the product down into its

individual parts and sends them out to the appropriate flexible production technologies, the SLS machines manufacturing the moulded parts. When each part is finished the product is assembled and packed for despatch.

The production from Reebok is despatched periodically using the global delivery network with delivery guaranteed for the next morning.

When the quality of production and product price reached acceptable levels, all producers attempting to cut out tooling costs would follow this system. Products could be developed and sent to market with the costs coming only from design time and the prototyping, which would be just a test run. This empowered producer system would by default bring about an increase in empowered consumerism and mass individualisation."

After my presentation there was stunned silence, which in hindsight was more to do with my presentation method than its content. I asked Steve Weston if he understand the SLS technology? He replied "Yeah, we've already got four SLS machines in the labs. We're just prototyping at the moment, but the potential is there." Thanks to Steve Weston at Reebok, Boston.

Shopping Male.

As male domination of Internet technology stands, men will be the first digital shoppers. This won't last long as the choice and cost savings advantages increase the system availability and improve the interfaces, making the whole shopping experience more 'feminised'. As with my experience with Centro HL shopping will remain a social activity. The more mundane aspects completed at home. General shopping can be conducted in cafés grouped with friends around a complete interface television (CITV), a touch sensitive, multilingual, voice recognition and large flat screen. In specialist shops or chain stores it will be possible to select or construct your desired product on screen. The context of your shopping will invite interaction from the sales staff, friends and strangers. The products ordered in the neutral home and café environments will be delivered to your home but products purchased in the specialist shops can be collected. This allows, amongst other social functions, a reassuring interaction with staff, fixing in reality an otherwise ethereal shopping experience. To be successful this system, as any other relies heavily on the interface and whilst in Milano I talked with Perry King and Santiago Miranda about the posibilities for interaction with computer systems. "Perhaps now, at last, our interface with computers is beginning to escape from the limitations of the keyboard and screen,

from instruments whose linguistic poverty in no way reflects the richness of the processes they control, away to a more general area of interaction, involving other senses, new instruments, closer to our human perception.

A place where people can interact together and no longer be isolated with their technology, a place for social activity rather than isolated work.

These changes reflect a development in language of tremendous importance, it is as if literature had been confined by technology to the numbers and lists of the accounts that the Summarians pressed on to clay tablets and now, suddenly, our world will be illuminated by the fact that we can write poetry." Thanks to Perry King and Santiago Miranda, 23 September 1998.

Evolution Start Up.

The next step comes almost naturally. Super fast Internet access to intuitive and intelligent 3D modelling software. Which in turn controls flexible manufacturing made universally available by global distribution. The start up costs on setting up a company with this kind of manufacturing and distribution base would currently be enormous. The basic requirement for setting up a business like this will soon be just an Internet site. Vigin net has quoted me £15.00 a month for my own 10 Meg site. Obviously there would be other costs, rental of downloadable 3D modelling software, design and prototype costs.

Don Law of venture capitalist Yorkshire Enterprise comments, "The concept of a virtual manufacturing business is a logical extension of the drive to outsource more and more of their product line. There is no reason not to believe that tomorrows manufacturers will be similar to today's IT providers with a compact Head Office comprising R&D, design and procurement. However the funding of these 'new animals' will require equally innovative financial solutions. Most current investors don't like the risk associated with businesses that lack physical, tradable assets and where the main asset is mobile and with two legs! The financial backers can only come, in the short term from the ranks of a few UK based business angels with an appetite for risk or the members of a typical US venture club. In the longer term the main stream funders will be the Banks, Pension Funds etc who will have to join the real world and adapt or die. The virtual manufacturing entrepreneur will have to accept in exchange for sharing in his risks the investors will expect a commensurate reward" Thanks to Donald Law, Group Managing Director of Yorkshire Enterprise Ltd, Leeds, 15-09-98.

Sites could hold massive catalogues because development costs are minimal and no product ever need be withdrawn. If you consider my personal design output, which used current development methods, has been about four products a year. My back catalogue would now total nearly 50 products. Some of these I would definitely delete. Once the system was established all new design work would be produced in whole or in part by this method. More interestingly back catalogues of designs would be passed to engineers who could digitise the object and replace the original manufacturing methods with the new flexible methods. As manufacturing methods improved conversion programs would be written to update 3D models using older production technology. Once an object had been digitised it would be available forever. Eventually you would be able to buy a replica of any product made anywhere in the world and at any time. I have called this theory the Total Availability of Contemporary and Historic Objects (TACHO). Your personal database will hold all sorts of data, all your work, your body model, all your purchasing decisions from the past. Just like Star Trek, "I'd like that Mojeto that I had in 'Atomic', Paris in 3020". Total and secure information management in all aspects of global life will be possible. Sites, which help you select from the vast array of possibilities, will be popular. Interior design sites similar to Elle decoration will allow people to retain some security of conformity whilst still feeling individual. Profit share will be calculated on click through nano charges. Each site link creating revenue for the host site.

Gio who part runs "Backspace" a freelance Internet site expanded on TACHO. "The virtual world will allow you to sell anything. Why sell the object when you could sell the exact time and place it came from. Why not sell the time and place something may come from. The digital world is new, the rules are not yet in place. This could be a new form of ownership different from property. That is a good thing." If you understand it and Gio has bothered to sort it out, go to http://www.backspace.org/ and buy a piece of the future from Gio. Thanks to Gio at Backspace.org, Clink Lane, London.

Crafty.

The participation in production due to the ease of producing flexibly manufactured, high quality objects will inevitably increase understanding of production and hence the perceived value of skilfully made craft objects. The currently quite large market for hand made, badly designed and produced objects will hopefully die out leaving only genuinely innovative craft pieces which will predominately explore materials as

form will be explored using the new flexible manufacturing. The proliferation of information and object production, will also temporarily lower the quality of both objects, but again with increased participation in the debate and the resulting understanding, design quality will increase.

Custom Car.

Whilst at Audi I asked Saleem how much it would cost me if I wanted Audi to make me my own car. "It really is impossible to say how much is would cost. At the moment we're working on the new A4. We completed build 'A' in December, build 'B' is nearly finished after eight months and we've just received the Strak for build 'C'. The door assembly has taken five Design Engineers about 15 weeks at 90 marks (£30) per hour. Audi is so powerful that all the parts for the car will be soft tooled for free by the companies, who want to supply the parts, so there is no costing for that. But it must be millions, there's about seven thousand parts. A new car must cost £20-30 million at least. But we aim sell a million of them so it's not so much. We are forced to use common parts through out the group. Volks Wagen own Audi, Seat and Skoda. They all will use the A4 chassis. We are moving over to mouldings to replace pressings as much as possible. Also Aluminium to replace steel. These changes and the computers are reducing the development time and the over all cost. This is good for us, as at the initial launch of a new car there are good sales but they quickly drop off. We then have to generate remakes to keep the sales up. Eventually I can see it all moving to individualism, just to keep the sales steady. But we've got a lot of investment in factory and it's going to be a long way off." Thanks to Saleem Lumb at IVM Engineering, Audi, Ingolstadt, South Germany, 23-08-1998.

Senza Titolo.

Everyone will use computers because they will seem simple, purely by virtue of their apparent non existence. In reality they will still remain more complex than is possible for one person to fully understand. Adversely, global computer assisted cultural understanding would be possible at a common level, again, as it has become simple. Generally things, which now seem complex, will be simple and we can move on to ever more complex things. People will follow this push as they do already in the pursuit of some meaning. Second hand computers and shared up links will increase the availability of networked third world Internet access. This will lead to India and other agricultural based cultures scrambling to lead the production of digital product. Big heavy technology countries with die hard industrial cultures such as Russia will

have to settle for servicing the new economy. The network is the truly new thing, everyone one on the planet and all their possessions, everything that has ever been imagined or discovered, all connected. No one can imagine the connection of everything, it's just too vast and being able to provide for peoples needs, will be a very new position to be in. "Overcoming the barriers and limitations of traditional mass production will dramatically change the relationship between designers and the people who use the products we design. This is obvious to all of us but there has been very little debate on the real implications of this revolution.

Certainly it will help those who refuse the trap of either designing only for a cultured elite or designing with the lowest common denominator for a mass of consumers.

The new relationship will no longer be mediated by the old limits of production and distribution. New, more individual relationships will develop, but there are no rules and no experience to draw on. There will be new traps and new dilemmas to be refused and overcome, to avoid becoming policemen vetting people's choices or partners in a sort of formal anarchy where anything goes and pollution is rife."

Thanks to Perry King and Santiago Miranda, 23 September 1998.

A basic summary of the ideas in this essay.

- Transient rebirth objects. No 'new' design as no new physical technology to interface with. Increased importance of permanents.

- Tacho. The proliferation of flexibly manufactured object and information products.

- The only new thing is really the quaquaversal networks, digital voice and data, production and distribution, which are too vast and numerous to comprehend.

- Explosion of Designer sites and new business's. Work will become more personal, people will generate their own goals and manage their own international business's. Work will become more like a game.

- Intelligent interfaces which adapt to your type of Input Output machine. The best being multilingual, photo realistic, touch and voice activated but still visual.

<u>Acknowledgements.</u>