

the seven design principles of
every
New Product

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intentions

the first intention of this text is to address the common occurrence of 'future shock' by providing a simple framework for those interested in comprehending 'what is going on'.

Alvin Toffler in his famous book 'Future Shock' presented the case that it is not simply the direction of change that confronts us, it is the rate of change itself. His title 'Future Shock' relates to our experience of 'Culture Shock'. When we visit a foreign country we are exposed to new and different ways of living and this can shock us to the extent that we can not participate in the everyday things that we normally do.

Taken literally, Toffler's Future Shock suggests the rate of change coming at us is at such a pace that it shocks us, dislocates us and confronts us. Our experience is one of being lost even though we are still at home.

To quote Lewis Carroll in 'Through the Looking Glass', we "find ourselves in a wonderland, where everything is at once so familiar and recognizable, yet so strange and uncommon."

The source of 'future shock' or 'culture shock' is that our concepts and thoughts about where things are and how we operate effectively are displaced. Our sense of effectiveness is damaged and our sense of our selves and our ability to cope is lessened in some way.

The underlying premise behind the notions of the Post Modern Society parallels this experience and much of this work is aiming to create new models that are more useful for us in the new world in which we live.

Technological change is a major driving force behind these changes and the world is screaming out for ways to relate to this flood of technological innovation.

This text is offered as an opportunity for you to update your mental models and look afresh at the new products and new technology that is popping up around us everyday.

the second intention of this text is to provide a framework for innovation. My bold claim is that the principles in this book could be used to re-invent EVERY new product that is created over the next decade (2002-2012).

To mis-quote Bob Dylan, "the designs they are a changin".

In a business world of instantaneous communication, global competition and evaporating product life cycles, the key to serving your customers lies in the design of your products.

Perhaps the most powerful example in recent years has been Apple Computer and the iMac computer. In the year prior to the release of the iMac, Apple Computer was sliding out of business. Their share of the personal computer market had slid to 4%. Less than two years after the release of the iMac, their market share was approaching 10%.

Apple had reinvented the personal computer. They killed the beige look, they killed the box look and they breathed new life into the design of computers - and their company.

This is what this text is all about: Re-inventing your products to create a significant competitive advantage for your business AND for your customers.

As Rosebeth Moss Kanter, former editor of Harvard Business Review suggests, 'the secret of innovation lies in the temporary monopoly it gives you and this means you can charge more for it.'

The principles offered here are intended as a conceptual design framework. These are the broad stroke principles that can be brainstormed to re-design your existing products and to create entirely new products and product categories. The actual 'how you do the specific designing' is a topic for another occasion. This text is intended to start you thinking about what is possible!

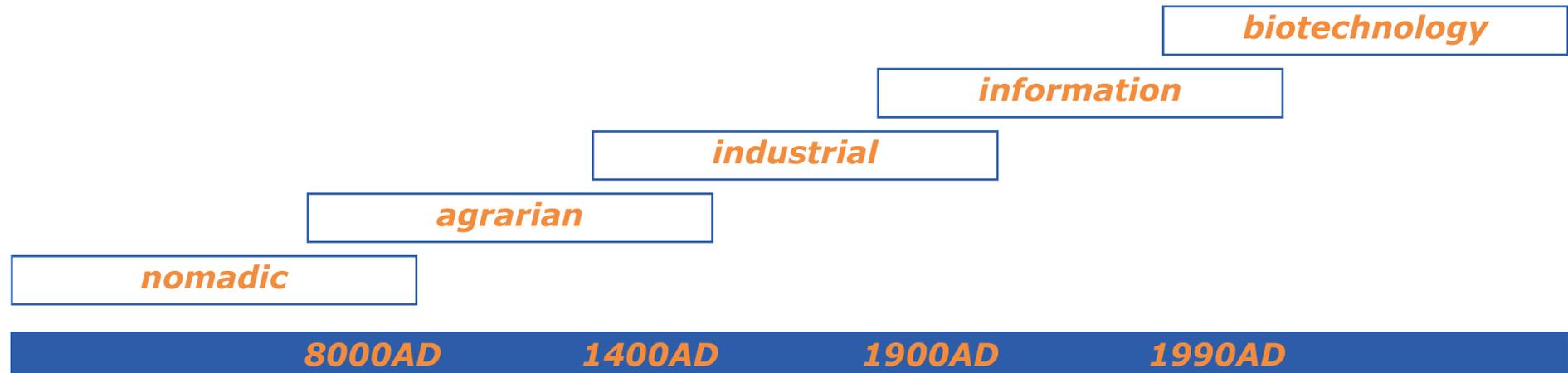
important note

The term product is usually loosely to refer to any manufactured item or service that is offered to the general public for consumption.

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the ages of civilization



This diagram is a simple illustration of the stages, or different ages, of the history of western civilization on planet Earth.

survive

For a while there, the early human beings simply wandered nomadically around distinct and small sections of the planet to get food as they needed it - which usually meant a bit of work each day. In many ways, the primary focus of this era was 'survival'.

food

The second phase, 'Agrarian' refers to the period when crops and agriculture were the main focus of society. This is literally the planting of the seeds of western civilization as we know it, with the Babylonians, the Egyptians and others staying in the one spot, building cities, building governments and

extending the smaller nomadic communities into towns and cities. In many ways, the primary focus of this era was to 'feed ourselves'.

make things

This stability of location fuelled the rise of invention and discovery and led us onto the Industrial Age. The Industrial Age is best known for the making of things with the emergence of factories, employment and jobs as we know them today.

know things

The Industrial Age was soon usurped by an era that now presumes it can make things and is entranced by the idea of making better things. To make better things we need to know more and then to make even better things, we need to know even more (or to at least know some thing different).

This is the Age of Information that we are now surrounded by and that is being fuelled by communication and notably the phone and computers and the other bits and PC's of information technology.

grow things

The next stage literally grows out of our thirst for knowledge, a Biotechnology Age. When you add information to your ability to make things you open the door for how nature builds things. The uncovering of the structure of DNA and the Human Genome Project are critical accomplishments in unleashing the potential for humans to redesign nature. I suspect it will be around 10-20 years before biotechnology becomes the basis for everyday life in the way that the internet, computers and other information age technologies are today.

My term for this coming era is 'The Creation Age' since we will be creating new products at the biological level, a god-like level of design.

the information age

To talk about the 'information age' today is a little like talking about the 'good old days'. For many social commentators it is considered passé. What is more popular and more current are the terms: 'The New Economy' and 'The Post Modern Society'.

In my opinion, these are both a new spin on an old theme.

The New Economy generally refers to the dotcom boom and the push to electronic commerce. I suspect it is simply the filtering down of Information Age technology to the point that any company and the everyday person can now make some money from it.

This is also shown through figures of productivity gains from investing in information technology (IT) for the past 20 years and these have fuelled the biggest bull run on the US Stockmarket ever. The key technology here is the internet and the digitalization of money.

The motor car is often considered to epitomize the Industrial Age - not only for the production system that created it, for the way it became a consumable product and the way this has led to the complete redesign of our cities and our lives (and our relationship to space and time).

I nominate the internet to be the information age equivalent. The New Economy is simply a reference to the opportunity that this new platform for communication and social interaction makes available for the business world.

In a similar way, the inquiry into a Post Modern Society is a reflection of the impact of the technological change driven by electronic technologies.

I think this is best summed up by the words of Marshall McLuhan in his book 'The Medium is the Massage': "The medium, or process, of our time - electric technology - is reshaping and restructuring patterns of social interdependence and every aspect of our personal life. It is forcing us to reconsider and re-evaluate practically every thought, every action, and every institution formerly taken for granted. Everything is changing - you, your family, your neighborhood, your education, your job, your government, your relation to "the others." And they're changing dramatically."

The enquiries of the Post Modern Society are extremely important as we attempt to redefine who we are in the light of the new electronic technology and the new possibilities they offer for our lives.

Throughout this text, we will refer to the Information Age as the context for these ideas and inclusive of this is the thinking of the New Economy and the Post Modern Society.

from industrial to information

To highlight some of the key conceptual differences between the Industrial Age and the Information Age, here's a simplified comparison collected from a wide variety of sources.

the industrial age

Mechanical
Renaissance
Newtonian Physics
Visual Space
Detachment
Connected/Linear
Sequential
Cause and Effect
Homogenous/Uniform
Material Intensive
Product
Standardization
Physical
Sport
Single Viewpoint
Perspectivism

the information age

Electric
20th Century
Quantum Mechanics
Acoustic Space
Involvement
Continuous
Relative
Simultaneous
Multi-locational
Knowledge Intensive
Knowledge
Customization
Mental
Art
Multiple Viewpoints
Mosaic Forms, Cubism

the industrial age

Static
Absolute Truth or Reality
Idealized Conception
Seeing is believing
Past, present and future
Past remains fixed
Science
The Objective Viewer
Specialist
Independent
Cause and Effect
Hardware
Clock, Wheels, Cogs
Facts and Figures
Western
Civilized and Literate

the information age

Fluid, Active
Personal Reality
Perception
Believing is seeing
Now!
Past changes to current viewpoint
Art
The Perceptual Response
Holistic
Interdependent
No beginning or end
Software
Water, DNA, Virus
Knowledge
Eastern
Tribal and Pre-literate

conceptual design principles

This framework for contemporary design is based upon seven principles of information age technology.

As an access point for looking at the driving forces of, and the opportunities for predicting future changes, we have developed a model for contemporary design: 'The Seven Design Principles'.

In contrast to traditional design principles that define the appearance of designed objects or a process for how to design, these principles derive from the technology that creates the design.

In this way, these seven principles describe the 'qualities' of the designs (or the finished product) and include a way of thinking rather than simply a description of a product feature.

They are intended as a conceptual framework and a starting point for brainstorming new opportunities and new products.

the seven design principles

The principles of this text are presented as the principles of Information Age Technology.

the first principle is naturally, information.

The focus on information has become a product in its own right. This is not restricted to simply IT (Information Technology) applications, the opportunity exists to incorporate 'information' into all new products.

the second principle is 'electronify'.

This principle also becomes apparent when we consider the Information Age context is reflected in a shift from mechanical technology to electric and electronic technology.

The next five principles are sufficiently distinct facets of the first two to be considered as separate principles. They are:

intelligence

'Intelligence' implies the ability of a product to incorporate some form of decision making in responding to the forces placed upon it.

interactive

'Interactive' is the ability of a product to respond to forces generally placed upon it.

location

'Location' refers to the cutting of the tie to a location and can be referred to as 'location independence'.

personalize

'Personalize' is the opposite of 'standardize' and represents a fundamental shift in how products are created.

virtual

'Virtual' refers to a 'simulated' or a metaphorical equivalent to another technological or natural form.

organization

This material has been written in simple terms for easy understanding. It has also been organized into distinct categories to make it as simple as possible to compare, contrast and pinpoint these principles in action. Clear headings and categories also make it possible to review these ideas quickly and easily without having to spend days to find the key points. We estimate this entire text can be read in around 2-3 hours.

The key categories are:

definitions

We define the terminology of the words that we are using.

key words

These key words are your ally in uncovering these principles out in the world. This text is intended to be a useful, hands-on guide to everyday life. As soon as you hear one of these key words you can relate it to this framework and comprehend the pattern of new products that are emerging.

examples

By pointing out well known examples we can see that many products already exist based upon these principles and in areas we would not previously have considered or recognized.

innovation questions

To assist you to translate these principles into opportunities to create new products we offer some questions to spark some ideas.

information

The fundamental shift to Electronic Technology is commonly described as the transformation from the 'Industrial Age' to the 'Information Age'.

One of the best examples of the shift from 'Industrial' to 'Information' and one of the key markers of this transformation, is the type of work that is being done by the majority of workers.

To state it simply, the primary job function of the majority workers today is no longer physical work (eg. digging a hole or making things), it is now, to manage information (or mental work). This may include: working on a computer, doing the accounts, planning and designing future events or negotiating contracts.

It has been estimated that about 50% of our Gross National Product (the term used by economists to measure how much production of goods and services a country creates) is now information based.

As technology, 'IT' (information technology) has found its way into every nook and cranny of our lives from our computers to our electronic diaries, through to programming your video recorder and using an Automatic Teller Machine (ATM).

information definitions

to inform is to 'give form to'.

What do we mean by 'give form to'?

If we were to think of 'giving form' in the context of design, this would probably make more sense.

Consider, an architect is designing a house. At some point, the architect starts the process with a blank sheet of paper and as she sketches the beginnings of a house emerges. We could say, 'the house literally begins to take form'.

information: that which gives a new way of looking at things

In terms of being 'informed', we can say that the information 'gives form to a new coherence' or a new way of looking at things.

If 'information' does not give us a new coherence, then perhaps it is only data.

information key words

information

This is a rather obvious one!

info

'Info' is short for information. It is often used as an abbreviation as a product name or a company name. For example, the search engine 'Infoseek'.

knowledge

Knowledge is generally recognized as being a higher level of information than just plain, ordinary, everyday information. One useful distinction here is that knowledge is knowing when to use which piece of information.

data

Data is like fuel for information. The mental picture I hold around data is a page of numbers not organized in any particular or meaningful way. If the data is then converted into a graph, it may become information that informs us about whatever the numbers are measuring. To know when to use this information to good effect is when it becomes knowledge.

quality

The focus on Total Quality Management is one facet of the shift to information. In the Industrial Age, the emphasis was on quantity and mass production. Henry Ford's assembly line is heralded as a landmark event in the race to mass produce

goods. Now, the ability to produce quantities of information is easily accomplished - just check out the world wide web! The emphasis is now on the quality of information. Inside this shift, it is little surprise that a movement around the management of quality should surface.

information examples

information technology (IT)

Technology that processes information as compared to industrial technology that processes a physical raw material (eg. steel).

websites

A website is a classic information product in that it exists solely as digital information. At a design and user level, it offers two channels of information, being predominantly visual information in the form of text, graphics and photographs. The second information channel is audio which is growing in importance with links to mobile phones and the downloading of music files. Video is a combination of visual and audio.

infomercial

As distinct from a 'commercial', which is a pure advertisement which runs along the lines of 'Hey! Here we are! Come and get it!'. An 'infomercial' is literally a blend of information and commercial. This follows a marketing trend toward providing more 'hard information' to entice your customers. This may include details about the quality of your product (such as how many stitches go into your shirt) or about the company itself (such as how many nobel prize winners are on your staff). The game has shifted from 'selling' to your customers to 'informing' and persuading them.

the 'cold war'

The 'Cold War' between the US and the USSR is an example of information warfare. The emphasis was not on physical damage and firing physical missiles, it was more on propaganda, espionage and uncovering military secrets.

Perhaps the highlight of the effect of the 'cold war' was the space race. As President Kennedy has admitted, the challenge to be first to put a man on the moon was driven out of a desire to be 'seen as superior' to the Russians. Notably, the Russians turned their attention to other space quests once the Apollo team landed on the moon in 1969.

the knowledge worker

An employee who's expertise is based upon what they know, as compared to a traditional worker who's expertise was based upon their physical skills.

datahousing

If 'warehousing' is putting your 'wares' in a house of storage, then 'datahousing' is an electronic equivalent.

books

Printed books are a classic information product. In the traditional print format and in the new electronic format (e-books) what you are purchasing is not so much the paper or the digital bits, it is the entertainment value or insights that are gained from engaging with the content or information within the book package that counts.

infotainment

This is similar to 'infomercial'. It is a combination of 'entertainment' and 'information'. It suggests the program is not simply 'entertaining', it contains some useful 'information' as well. In programming terms, it may be like crossing a documentary with a sit-com (situation comedy). There has been a flood of 'infotainment' shows ranging from gardening and weddings to finance and house renovations.

information superhighway

This term was coined by former US Vice President Al Gore and provides a metaphor for the Internet. It is based upon the car metaphor, but this is not just any highway, this is a 'superhighway' and it doesn't carry cars, it carries 'information'.

The European equivalent to this term was 'Infobahn' a switch from the freeways in Germany known as the 'Autobahn'.

knowledge management

When management began as a study and practice a hundred years ago, the emphasis was on managing people - your staff and employees. Today, the management of knowledge (and information) has become a discipline in its own right and is now seen as critical for large companies.

intellectual capital

In the Industrial Age, the way to become rich was to own physical capital such as railways, steelworks, factories, property and boats. The run of Internet and software millionaires and billionaires show the game has shifted to Intellectual Capital. Intellectual Capital includes patented ideas, brand trademarks, software and designs. It is not so much what you know, more a case of creating technology to manage and utilize what you and others know.

information overload

John Naisbitt says in his book 'Megatrends', "Running out of information is not a problem, but drowning in it is." (Page 16).

The problem with information is that it is so easy to create, reproduce and distribute. Consider your emails. How many

do you get each day? How many of these have merely been forwarded from other sources?

In the Industrial Age, it took something to write good content. Today with information processing technology it is relatively easy to create good content. Consider writing a book by hand versus using a computer and word processing software.

When we are drowning in information and there is simply too much of it to manage, it is called 'information overload'. Another way of saying this is that the information has insufficient 'structure'.

In contrast to creating physical goods, information needs structure and organization to be useful. For example, a page of numbers may make little sense compared to the elegant and simple line of the numbers plotted on a graph. The graph provides structure for the data.

reality TV

Traditionally, television programs, apart from the news, were scripted versions of theatre-like productions, made up and acted out in front of a television camera. The recent emergence of reality television shows, such as 'Survivor' and 'Big Brother', represents a shift to shows based upon 'real' information as compared to 'scripted' information.

This acknowledges a shift from creating 'content' to creating 'structure'.

Traditional 'sitcoms' require writers to create 'quality' content with trained actors performing according to the script. In contrast, Reality TV shows merely set up a structured context inside which the 'actors' (usually untrained) generate lots of

random content. The task for the producers is to capture the content and then structure it into a format suitable for viewing.

the internet

It has been estimated that there are well over 100 million pages of information on the World Wide Web. If we consider this resource is available to anyone in the world with internet access, more people have more access to more information than at any other point in history.

The explosion on books brought about by the development of the printing press fueled the growth in knowledge that is collectively known as The Renaissance in Western Europe. The Internet is the information age equivalent and we are merely at the beginnings of this new technology.

In contrast to the Renaissance book explosion, the internet comprises text, images, sounds, videos, photographs, animations... It is literally a sea of opinions with the opportunity for everyone to create their own website and publish their views about life, the universe and everything. This includes all the propaganda of businesses selling their products and special interest groups campaigning for their cause.

information innovation questions

What is the intellectual know-how related to this product?

The 'intellectual know-how' of a product is the information that is required to create a product and bring it to the marketplace. This includes: the design description of the product (eg. size, shape, materials), the information required to manufacture it, the market research data that tells us the demand for the product, the material that sells the product (eg. the product brochures, display stands, television commercials, etc.) the instructions for using it, the knowledge required to repair it and the final question of when is it obsolete?

There is a vast amount of information that is required for the design, production and marketing of a product. If you can build your awareness about the types and levels of this information, you have an opportunity to use this knowledge to redesign your product, sell it better or repackage so that it is easier to use.

For example, a laundry powder company has now created a call centre to respond to questions about getting better results in removing stains with their product.

What intellectual know-how could you present to your customers to create extra value? This then needs to be followed up with 'What is the best way to deliver this?' Could this then become a new complementary product?

What information do we need to know to be able to operate this product? (Both conceptually and specifically)

For example, when driving a car we need to know how to start the car engine, how to steer, how to control the speed of the car (brake, accelerate, coast) etc. We don't need to know the technical details of how this happens, just broadly that some actions produce certain results and this specific action will produce this specific result.

However, for some other products, particularly in the early development phases, this lack of knowledge can stop people using your product. For example, suggestions about the use of the open source Linux operating system are that users are generally highly trained in programming rather than casual computer users. To expand the audience using the software, it needs to be packaged in a different way to make it easier for a less experienced users to benefit from this product.

What information do new users of your product need to know to use your product? This may be addressed at a marketing or promotional level or it may become the basis for a new complementary product by yourself or an alliance with another company.

Another aspect of this question is the knowledge that is needed to operate your product efficiently or safely. For example, when driving a car you need to know how fast you are going to satisfy the speed limit. Cars therefore need a speedometer to measure the speed you are travelling at.

This is a specific product within a larger product and is an opportunity for differentiation or improving performance. For example, a shift to a digital speed reading from an analogue dial may make it easier to add cruise control which then becomes a special feature and potential selling advantage for your car.

What else can you add to your product that would truly make it easier and more efficient for your product user?

What information do we need to know about the context in which this product is used?

For example, when driving a car we need to know that there are road rules to follow and they may be different in different places. This is generally tacit knowledge that is 'taken for granted' as known, particularly because you need to pass your driving test before you legally can drive on the roads. Yet, if we examine this level of knowledge we can spot opportunities for improving or creating new products.

For example, if we found out 75% of car users for a particular model regularly drove their cars at night in the country, we may change the lighting design on this car as compared to one that is typically driven in the city at night. The latest crackdown on drivers using mobile phones whilst driving is an opportunity waiting for a solution.

How can the level of knowledge required to operate your product be expanded, reduced or altered to add value to the end user?

In 1900 Mercedes-Benz did a study that estimated that worldwide demand for cars would not exceed one million. Less than 20 years later, there were 8 million of Henry Ford's Model T's in America alone. What happened?

The Mercedes Benz study was based upon a presumption that the demand for cars was limited by the availability of chauffeurs. This was based upon two further assumptions. Firstly, that only people who could afford chauffeurs could afford automobiles. Secondly, that driving a 'horseless carriage' would take as much expertise as driving a 'horsed carriage'.

Whilst it was probably not consciously considered, the motor car reduced the level of skill and expertise required to drive a 'horseless carriage'. Simultaneously, Henry Ford's mass production of motor cars reduced the price sufficiently to enable more people to afford personalized motorized transport.

Reference: Deborah Wise in Stewart Brand, The Media Lab, Page 255-6.

Similarly, most software products now come with a series of help menus and assistants to expand the knowledge of the user. This enables the user to be more productive and gain greater value from the software.

What can you do to educate the users of your products? Look beyond the obvious here and ask yourself, 'Who could we team up with to multiply the value of our product offer?'

electronify

One of the driving forces behind the shift to the Information Age is the shift from mechanical to electric technology.

The shift from a watch with cogs and moving parts to digital watches with only electronic components is a good example.

Electronic technology is an extension of the 'electric' and I have created the term 'electronify' to describe the action of converting items that were previously mechanical into new 'electronic' forms.

For example, the motor car is becoming 'electronified' as shown in the cost to produce a motor car is now more in terms of the electronic components than the cost of the steel.

General examples of 'electronify' are often expressed by the letter 'e' displayed before a more familiar term. For example, e-commerce means 'not normal commerce', but 'electronic commerce.' Other examples include: e-books, e-cash and e-tickets.

electronify definitions

the conversion of a device to being electronically based

Electric = pertaining to, produced by, or operated by electricity

Electronic = the science of conduction of electricity in vacuum, gas or semiconductor

Electronify = the conversion of a device to being electronically based. Typically, this is the conversion of a mechanical device.

electronify key words

'e'

No, we are not talking about drugs here! 'E' is shorthand for 'electronic' and is the classic sign of a product being transformed into an electronic version of an existing product.

Examples include: 'E-commerce', 'E-tickets', 'E-diary', 'E-book'. They are electronic versions of some other more familiar product. When a revolutionary product is created, it makes sense in the beginning to market it as being 'like something else'. For example, an 'E-book' is like a book, except it is electronic. By using familiar terms, we are able to make new things more easily understood.

digital

Being 'digital' is in contrast to being 'analogue'.

Analogue means to resemble something else, as in an analogy.

In terms of technology, analogue is often displayed through gauges and dials. A traditional thermometer is an analogue display in that the rising or falling mercury in the thermometer gives a direct measurement of the temperature. Similarly, the traditional speedometer dial in a motor car rises as the car accelerates and falls as the car slows down. A watch with hands is also an analogue display.

In contrast, digital refers to a display by digits or numbers and derives from the binary (meaning 'two') states of electronic switches. A binary form is either 'on' or 'off'.

Digital displays are usually shown as a set of numbers, as in a digital watch telling the time as '12:21' or as a set of bar graphs often used in stereos.

The connection between digital and analogue is a significant one in terms of the shift from mechanical forms to electronic technologies. An analogue display reflects the variable movement of the mechanical device whereas a digital display reflects the on-off nature of the electronic device. A digital device merely switches on and off so quickly that it appears to be a variable in nature.

In music, the old vinyl long playing records were analogue recordings with each sound mirrored in the groove of the record. The needle literally moved with the flow of the music. Today, Compact Discs are digitally recorded on the plastic disc, which means a series of very small on-off bumps are cut into the disc. In computer terms, these are called bits.

online

In contrast to 'offline'.

'Online' refers to the Internet. 'Online' means that you are 'on the internet'. For example, if I rang you on the telephone and your phone was engaged, it may be because you are 'online', in other words because your phone line is accessing the Internet. Literally speaking, you are 'on the phone line'.

internet, net, world wide web, the web

Internet derives from 'inter network'. A computer network is essentially the linking of more than one computer. In the beginning there was one computer, then when two computers

were linked, a network was created. The 'inter network' was created when networks of computers were linked, like a super network. The 'internet' literally means 'connections between many computer networks'. The 'net' is merely shorthand for the 'internet' which is merely shorthand for the 'internetwork'.

The World Wide Web (www) or 'the web' is one part of the Internet and where your website is posted (thus the address of most websites includes the letters 'www'.) Email is dealt with by a different computer system and whilst it is considered to be part of the Internet, it is not technically correct to say it is part of 'the web'.

cyber

The word 'cyber' comes from the Greek word 'kuberan' which means 'to govern, guide or control'. It is now generally used in relation to computers and robots.

For example, in 1948, Norbert Wiener invented the term 'cybernetics' to describe control systems for computers.

The more common example is 'cyberspace'. This term was first used by William Gibson in his science fiction novel Neuromancer (1984) in which the hero connects a computer directly to his brain. Today 'cyberspace' is considered to be one aspect of the internet, particularly in discussions around online communities and online game playing.

paperless

One of the clues to 'electronify' is a comparison to 'printing' and 'paperless'.

Printing is a mechanical action whereby some form of ink or dust is pressed or burnt onto the surface of paper. Anything

that is printed is not electronic. However, the means to printing the paper may include the use of electronics.

'Paperless' is an example of 'not that'. It speaks about something new in terms of what it is no longer. For example, the idea of a 'paperless office' is one that has no 'paper'.

There are various transitional inventions between 'printing' and 'paperless'. The fax or facsimile machine is a good example. It delivers the message digitally over the phone lines only to convert it to paper when it arrives at the other end.

electronify examples

digital watch

The digital watch is perhaps the classic example of what is possible when you shift from an analogue or mechanical mode to an electronic and digital mode.

The traditional watch has arms that physically move around the watch face and may include a date function. In contrast digital watches have a numeric display, have no moving parts and can have a stopwatch, timer, calendar, etc almost as easily as they tell the time to the hundredth of a second.

Dramatically, as the Swiss watch industry discovered in the 1970's, digital watches were cheaper to mass-produce and significantly altered the entire watch industry. Shifts in conceptual design rather than merely design appearance can have this effect.

the internet

The Internet is full of examples of physical things being transformed into electronic versions.

The most common example is the majority of small business websites that are often no more than 'electronic brochures' extolling the virtues of a company and their products.

Other obvious examples are often prefaced by the term 'online'. Online learning is learning that takes place on the net. Online stores are electronic versions of offline stores.

There are also online businesses that have modeled their products on creating online versions of other products. For example, online banking is a form of banking undertaken via the Internet.

e-commerce

As compared to 'normal' commerce involving face-to-face or written communication, 'electronic commerce' revolves around a complete electronic interface and typically refers to Internet commerce.

Many people relate 'electronic commerce' as if it only happens on the internet. This is not accurate. Any electronic transfer of funds is 'e-commerce'.

For example, ATMs or Automatic Teller Machines are electronic versions of tellers in banks in that they give you money based upon the electronic storage of your banking details and the magnetic data strip on your credit card.

Similarly, the name EFTPOS tells it all. EFTPOS stands for 'Electronic Funds Transfer at Point Of Sale'.

motor cars

Motor Cars are synonymous with the Industrial Age, being a mechanical solution to our travel needs. Given their dependence upon the rods and pistons of their combustion engines they are still fundamentally mechanical in principle. However, they are following the trend of 'electronify'.

Today, more of the cost of motor cars is spent on electronic components than on the traditional steel frame. We have electronic fuel injection to make our engines more efficient, electronic components added to our brakes to give us more control over our stopping ability, we have electronic instrumentation that more accurately tells us how much fuel

we have left and we have electronic systems to disable the car to minimize theft.

The push to electric cars would complete the 'electronify' process of the motor car.

compact discs

A comparison between an magnetic audio tape and a Compact Disc (CD) highlights several key aspects of the shift from mechanical and analogue products to digital.

Firstly a magnetic audio tape is a linear technology. It can only be read in a specific sequence. For example if you were looking for a favourite music track on an audio tape you would have to wind the tape in sequence forward or backwards to the song. In contrast, a CD is nonlinear. To find your favourite track on a CD, you can skip songs and go directly to the song of your choice.

Secondly, an audio tape is read by coming into direct contact with a 'recording head' or 'reading head'. The magnetic tape runs across the head and is then interpreted into audio. This is more obvious if we consider the old plastic records where a needle literally sat in the grooves on the surface of the round disc as it rotated. In contrast, a CD is read by a laser and no direct contact is made between the laser. The laser is like a finely tuned torchlight scanned across the notches in the CD and bouncing the light to be picked up by a light reader. The advantage here is that direct contact wears out the parts in contact, whereas the non-contact does not wear out the laser.

e-ticket

Rather than a physically printed ticket on a piece of paper, the ticket lives in a computer. For example, airline tickets. Rather than carry around your flight ticket, you simply need to check in at the desk, with some identification and a quick computer check later and you're on your way.

e-books

Books in the paper form are now facing competition from books in an electronic format. (eg. this book)

At the time of writing, sales of e-books have been slow and below expectation. I suspect this is due to the lack of advantages being offered by the current string of e-books. To be more specific, the current crop of e-books that I have seen are written as if they are print books and are simply packaged and distributed electronically.

Typically when a new form of technology is offered, it mimics the technology that it replaces. Currently, e-books mimic paper based books.

This provides advantages for easy distribution via a website etc. however it provides very little advantage for the reader given the quality of computer screens and the difficulties associated with extended reading from a computer screen. Given that a desktop printer prints around 300-600 dots per inch and a computer screen only displays at 72 lines per inch, there is a distinct quality difference.

However, the key advantage for an electronic book lies optimizing the digital form of the book. This includes inking and searching.

e-Mail

E-mail is short for 'electronic mail' as compared to 'snail mail' or the regular post a letter and delivery it type mail.

digital camera

A Digital Camera is an electronic camera.

Traditional cameras were mechanical devices that literally had a shutter that physically opened and shut to expose light on a piece of light sensitive film. Once the film was exposed to the light it needed to be developed in a bath of chemicals. Digital cameras have few moving parts and certainly no moving shutters because they are electronic. They do not need chemicals to process images nor do they need film to store images. All this is done digitally or electronically with your images created and stored as a series of digital bits called pixels (picture elements).

When products are 'electronified' there are often significant and unusual advantages. For example, with a digital camera, most have screens on their back that enable you to view the images as soon as you have taken them. This would have seemed like an impossible dream if you had suggested this to a photographer 50 years ago as they pointed their film loaded mechanical camera.

digital watermark

A watermark is a product of the paper industry. They were created by paper manufacturers to identify their products and ensure customers were buying the reputable brand they thought they were.

Digital Watermarks have the same intention. They are an embedded piece of software code that identifies the authenticity of an electronic document and along with 'digital signatures' they form the beginnings of attempts to show ownership and authenticity in an era of electronic documents.

cybersquatter

A squatter is someone who 'squats' or takes up residence in a house they do not own. For example, an abandoned house may be occupied by a homeless person.

In internet terms, a domain name, such as 'www.designprobe.com' is the electronic equivalent to real

estate or a street address. For example, you may consider 'Park Avenue' to be THE place to live in New York. Some people were willing to pay a million dollars or more because they believe having the right domain name, such as 'drugs.com' is the electronic equivalent to living on Park Avenue.

Similarly, a 'cybersquatter' is a person who buys an internet domain name in the hope of selling it to an organization who uses that name in an offline business. In Australia, the largest telecommunications carrier 'Telstra' went to court to enforce their exclusive right to the name 'telstra' as a domain name. The name had been registered in one online category by an individual who intended to trade under that name online.

electronify innovation questions

What products are currently not electronic?

Do an inventory of items in your house or office. Which products are electronic and which ones aren't? More importantly, which elements of your products are not electronic?

Not so long ago, motor cars were mostly mechanical beasts, today it costs more for the electronics of the motor car than it does for the steel. Think of all the electronic components in your car: the braking system may be electronically controlled, you may have electronic fuel injection system, the ignition system, the hydraulics and suspension may also be, and the CD definitely is.

Whilst the car remains true to its mechanical origins, a number of new relationships are changing. For example, the grease monkey who worked in a dirty garage not so long ago is now more likely to be wearing a clean pair of overalls and use an electronic diagnostic kit rather than a wrench.

This presents another set of opportunities: when products become electronic their support systems also need to change. What support systems could you create for electronic products?

What difference would it make if they were?

If you have completed the earlier question, you will now have an inventory of products or elements of products that are not electronic, ask yourself 'What difference it would make if these products were electronically based?'

This may be in the form of: what new efficiency could we produce? For example, the engine of most motor cars may still be the traditional combustion engine yet when you add electronic fuel injection, the performance results are dramatically improved.

Another place to look is the control systems of your products.

If you could control the produce more precisely, what would be available? The shift to electronic timing has had a dramatic impact on sporting results at the elite level with records and results now recorded down to the hundredth of a second.

Also, if a product could be made to be electronic, it could potentially be controlled from a distance by remote control. How would this change in relationship create new opportunities?

Consider the advantage of having a remote controlled garage door rather than having to get out of the car on a wet and windy night.

Likewise, what new features could be added when you make your product electronic?

For example, the success of the digital watch over the traditional analogue watch was partly due to the cost savings as well as all the added new features. Not only did the new digital watch tell the time in various time zones, it was also a stop watch, a countdown timer, an alarm, etc.

What is the digital equivalent of your product?

This question is also asking you what is the 'virtual' equivalent of your product. When you go digital, strange things happen. It is not a straight line swapover.

For example, digital Television is not merely an analogue television with a clearer picture. It is a completely new product capable of very different things. For instance, it allows for user interaction and split screens. This is a very different dynamic than the one choice fits all analogue model.

Perhaps the easiest way to answer this question is to look at: 'What is the effect I am trying to create?' In other words, 'What would I like my product to be able to do?' Brainstorm this for a while and then work backwards through the details of what it would take to accomplish this effect.

intelligence

Intelligence presupposes some ability to think and respond to what is going on. Whilst it requires some level of awareness, it does not infer that the product thinks like a human being.

Typical mechanical devices like motor cars several decades ago were simply beasts of steel with virtually no capacity for reason or decision making. Today, cars possess various levels of awareness. For example, Electronic Fuel Injection is able to think to the extent that it can optimize the rate at which fuel should be pumped into the combustion chambers within your engine. On the IQ (Intelligent Quotient) scale, this wouldn't rate a mention and yet it is a major step toward products with some level of reasoning or decision making capability.

Examples of 'intelligence' are often prefaced by the word 'smart'. For example, a 'smart card' refers to a credit card which includes a computer chip that is able to store and restore data. Earlier 'dumb cards' simply had a magnetic strip that was able to store a preprogrammed and unalterable piece of information into it.

intelligence definitions

a product that has some thinking, reasoning or decision making ability

Mechanical technologies are epitomized by cogs and wheels and physical actions. For example, a waterwheel is physically pushed by the water. Whilst the water wheel speeds up and slows down in response to the flow of water, we do not say it is intelligent because it is merely reactive in its movements.

In contrast, electronic technologies can be programmed to detect certain events happening and then respond accordingly. This could be as simple as a motion detector turning on and off an outside light or it could be as sophisticated as a supercomputer beating the world champion at chess.

Many effects that appear to be intelligent are relatively simple and merely tap into the speed with which computers can complete their tasks or they tap into a stored memory. For example, a spell checker for word processing software may appear to be very clever when in reality it is merely comparing your word with a list of words stored in its memory.

Remember, whilst we are saying a product is 'intelligent' we are not saying it can think like a human being.

intelligence key words

intelligent

This one's rather obvious. For example, a software helper may be known as an 'intelligent assistant'. A closely related word is 'intellectual'.

'i'

In the same way that the letter 'e' is used as shorthand for 'electronic', the letter 'i' is sometimes used as shorthand for 'intelligent'. For example, 'www.isyndicate.com' offer 'intelligent solutions for managing and sharing digital information'.

This is not as clearcut as 'e' because the letter 'i' is also used as shorthand for the 'internet'.

smart

As we have suggested in other areas of this text, there are certain words that are used to denote new aspects of technology and they are usually spoken of as opposites of what things were previously. The term 'smart' is the opposite of 'dumb' and is used to describe technology that has some increased range of options.

For example, a 'smart bomb' is an oxymoron to some people in that it presents the possibility that a weapon of mass destruction, like a bomb, could be 'smart' in any way shape or form. Nonetheless, it is considered smart because it can be manoevered in mid-flight with the help of a camera in its nose and a remote control guidance system. This is in contrast to a 'dumb' bomb which cannot be controlled in this way.

robot

The term 'robot' is derived from the Czech word 'robota' which means 'controlled labour'. It was first coined by Czech writer Karel Capek in his 1920 play 'R.U.R' as the name for a group of artificial people.

Today, the term is commonly used to describe any technological form that resembles a human being. The Japanese lead the world in robotic technology and in particular the number of robots in use in production in their country. One peculiar aspect of this are various 'electronic pets' in the form of robotic dogs and other animals designed to keep people company where real live biological pets are not permitted.

neural

Neural means to 'relate to the nerves'. A common metaphor of electronic technology is that it mimics the nervous system of the human body.

Where you find the word 'neural' relative to technology it refers to an electronic array of components that is performing the role of a simulated nervous system. For example, a 'neural net' is short for a 'neural network' which is a special type of artificial intelligence computer system designed with the intention of thinking like a human being. In contrast to digital computer systems, neural nets are designed to learn for themselves based upon assembling and considering various rules of logic created in their software.

thinking

The focus on information also emphasizes a shift from the 'physical to the mental' and from the 'doing to the thinking'. Words such as 'brainpower', 'thinking', 'the mental edge', 'perception', 'intellect', 'intelligent', 'smart'.

One of the significant trends around this shift is the re-emphasis on different 'ways of knowing'. This shows up in 'new age' thinking, a shift to the thoughts of Eastern Philosophy and a renewed attention of the thinking and cultures of the tribal cultures.

When you see these terms used, they may be referring to some aspect of information and a potential overlap with the principle 'intelligence'.

thinking etc.

Look for other derivatives of the word 'intelligence' to indicate technology that picks up this trend. For example, thinking, expert, cognition, wisdom, mental, intellect and reasoning.

automatic

The word 'auto' comes from the Greek word 'autos' meaning 'self'. The word 'automatic' means 'self acting'.

Automatic is the opposite of manual. The word 'manual' comes from the Latin word 'manus' which means 'by the hand'. The word 'manufacture' comes from 'manu' (the hand) and 'facture' (to make).

The most popular example is probably that of gear switching in a motor car. If you drive a 'manual', you change gears by your hand. If you drive an 'automatic' the car selects the gears for you.

These are important indicators of the origins and direction of technology. Mechanical technology was generally not automatic. It required a worker to input materials and operate the controls.

Automation is 'one machine controlling another machine'. When you add information to the control mechanism in terms of some form of feedback mechanism, you can create automation.

fuzzy logic

Fuzzy Logic is now being used in various household appliances. For example, washing machines that can determine how dirty your laundry is can modify the way they wash your clothes.

Digital technology is based upon binary electronic switching that has two states: on or off. Fuzzy Logic is based upon providing providing some grey areas between the black and white of this on/off switching.

intelligence examples

intellectual capital

In the Industrial Age, the ownership of physical capital such as raw materials or land were considered critical. Today, in the Information Age, knowledge that can be used to generate income or 'intellectual capital' is considered critical. The ownership of Intellectual Capital may be registered as a trademark, a patent or a registered design.

smart cards

'Smart cards' are relative to 'dumb cards'.

Currently, most credit cards are dumb. They have a magnetic strip that contains a small packet of unchangeable information.

Smart cards have an ability to store and update information. They typically include some form of microprocessor of a single chip which is embedded in the card.

Smart cards are currently being used and tested as: travel cards for public transport; electronic money for use in vending machines, storing personal details for people with medical allergies.

spiders, crawlers and bots

You may not notice them but the world of the internet is full of robots! They're not physical robots, they're software 'bots'. Most of the major search engines use 'spiders' and 'webcrawlers' to travel from webpage to webpage to index the world wide web. 'Bots' are slightly different in that they take on a specific task, find a suitable answer and come back and tell you the results.

artificial intelligence

AI or Artificial Intelligence has been the holy grail pursued by hard core programmers since the first electronic computers were developed several decades ago. In contrast to the high expectations of futurists, AI has yet to deliver at the pace that was expected.

One of the key areas of artificial intelligence is voice recognition software. Currently there are a number of software packages available for the PC user which do an effective job of translating your spoken words into digital text. Other software is able to translate your words from one language to another.

expert systems

An Expert System is a subset of Artificial Intelligence software. Expert Systems make selections and diagnosis based upon rules within a database. For example, a database may contain certain rules saying that if you have a runny nose, a sore throat and a headache then you may have the flu.

the internet

The internet offers a number of opportunities for giving the effect of 'intelligence'.

The ability to search for 'gold fish' on the Internet requires some rudimentary 'intelligence' to display suitable results. Whilst the quality of the results of current search engines varies, there is a great deal of work being done to have them be more 'intuitive' and 'intelligent'.

Taking this one step further, the technology that is used to run the auction sites is fairly simple on the IQ scale and does an 'intelligent' job of matching buyers and sellers.

On the web design front, the early web pages were written as HTML code. Today, WYSIWYG software writes the code for you making it much easier to create a site. Another way of saying this, is that the software 'automates' the code for you by packaging up sequences of steps into bigger chunks. For example, if you want to change the background colour of your page, you no longer need to write a full line of code with the colour expressed as a number, you can merely click on the correct 'page background colour' box and designate the colour from a colour palette.

automated telephone services

In recent years, the emergence of paying bills by telephone has emerged (I suspect this is an intermediate step prior to internet payment systems taking over completely).

The basis of these systems is a software script. When you ring these services, you are offered several alternatives and you make your choice via punching in a number on your telephone keypad. A script then takes you to the next option until you have completed your transaction.

intelligence innovation questions

What products are currently 'dumb'?

Whilst computers may be among our most 'intelligent' products in that they are able to process many instructions, I still find myself saying 'You stupid computer!' when things don't go to my liking. When ever you hear yourself saying 'you stupid thing', this is an opportunity to add some intelligence to the product in front of you.

For example, how about the milk carton knowing when my glass is full? Alternatively, the refrigerator that knows when I have no milk left and can place an order for me.

An easy place to start here is any product that is not electric or electronic. For example, a table and chair. Could your office chair be programmed to tell you when you sit on it that 'It is getting late and you could be spending this time with your family?' Alternatively, how about a chair that automatically adjusted it's height so that your feet touched the ground ensuring you sat in it with good posture?

What difference would it make if your product was made to think?

If only my lawn mower could mow my lawn without me! Aha! How about a smart lawn mower? Likewise, think of all the dumb things other people do. I'm sure if you think about this next time you are driving your car you'll see a fair selection of situations that could use a little extra intelligence.

One way to think of this question is: 'What situations with a little intelligence could I avoid?' Perhaps it is as simple as programming your garbage bin so that it flashes and reminds you that tonight is 'bin night'. Alternatively, a sensor in your

car that can detect if the car behind is going too fast to be able to stop before hitting you?

If we could put a human being inside your product, what would we then be able to do?

For fans of the movie 'Star Wars' you will certainly remember the infamous robots R2D2 and CP30. In the actual making of the movie, these robots had real live actors inside them to make them function the way the movie makers wanted. Particularly in the case of the human like and upright figure of CP30, this was a reasonably obvious and very effective solution to having a robot come to life.

Imagine putting a human being in your product, then what would be possible? For example, if there was a human being in my soup spoon, I would be able to tell if the soup was too hot before I put it in my mouth and burnt my tongue. Alternatively, if there was a human being in the lock on my door, I would see who was about to enter and either let them in or not before they had to fiddle with keys.

These may seem completely impractical solutions and they just may be the start of something new and exciting.

If we were to add a computer chip to your product, what would we make it do?

Consider any product that doesn't have a computer chip. Put one inside and then ask yourself, what would I program it to do? What information could it store? What situations could it's sensors track? How could it be linked to other products

with computer chips? What effect would it have if it was connected to the Internet?

For example, if a computer chip was in every product sold, store owners would know instantly what their stock valuation was, when to order the next item and where and when each item was sold.

Alternatively, if your car was connected to the internet, you could find out the latest fuel prices and shopping bargains as you approached a store and decide on whether to stop before you drove past.

What products would be more useful if they were 'automatic'?

For some people, driving a car and changing the gears is the thrill of driving. For others, it is one less thing they can do without. What else can you do without?

What would be really 'smart' for a lawn mower is that it would mow the lawn automatically. Yes, that's right, it simply mows the lawn whenever the lawn needs mowing, no questions asked. Perhaps this could be modelled on a sheep who grazes in your yard on a permanent basis and could be programmed not to eat your flowers.

Alternatively, what would it take to have a garbage bin that emptied it's own trash. Perhaps it could automatically sort organic waste from recycling and do the sorting for you. That would be one less job to think about.

interactive

The principle of 'interaction' suggests that two forces act upon each other in a two-way interaction rather than a oneway transaction.

A prominent example of interactive is the shift from the passive mode of watching television to the active mode of participating on the Internet.

Other examples include: Nike's 'Air' sport shoes interact with the ground in a new way, learning technologies such as 'Accelerative Learning' interact with the students in new ways and pivoting head shavers revolutionize the interaction with your skin.

Note: The principle 'interactive' is very similar to the principle 'intelligence'. Both of these principles imply some level of responding to the environment. A separation has been made on the basis that products can be 'interactive' but not necessarily intelligent. For example, the strings of a tennis racquet can be said to interact with the tennis ball that strikes its surface but this in no way makes the tennis racquet intelligent.

interactive definitions

when a product is designed to transform its form/shape in response to its use

To Interact is 'to act on one another'. The word 'inter' means 'between'.

This implies there are 'one' and 'another', meaning two parties are involved and there is some relationship between the two such that the action of one party influences the other.

Therefore, an 'interaction' is 'a mutual or shared action'.

In one sense, the notion of interactive products is consistent with every product that has ever been developed. For instance, any tool that is held in the hand immediately proclaims a relationship between the hand that holds it and at the very least, the surface texture of the 'handle'.

This level of relationship between product and user has now been significantly altered. In recent years we have seen the emergence of a range of products that are no longer fixed in a single form or configuration.

For example a traditional bicycle frame was intended to be rigid to 'resist' the forces upon it. Today, we have a range of bicycle frames that are deliberately designed to deform and change their shape in response to the weight of the rider and the road surface.

The key here is that the product is designed from the point of view of changing itself in some way in response to it being used.

interactive key words

interactive

Perhaps the most common use of the term 'interactive' revolves around computers and 'interactive multimedia'. Today, the 'interactive' label is often dropped as it is now well known that 'multimedia' is not a one-way medium, but is designed for the user to 'drive' the process and tell the computer what it wants to see and do. The internet is also based upon this thinking.

inter

'Inter' means 'between' and is often used where two different things come together. For example in transport we have 'interchanges'.

active

When the term active is used it is usually intended to distinguish the product as not being 'passive', 'static' or 'fixed'. For example, a new breed of clothing has emerged known as 'active wear'. Whilst this is not intended to be 'sportswear' (used when playing sport), it is for people in action.

relationship

Look for the word 'relationship' to distinguish a process that now focuses heavily on the interaction between two groups. 'Customer Relationship Marketing' is one example. Where this term is used, the relationship is often implied that it is 'personalized'.

responsive

The word 'responsive' is clearly related to the words 'responsible' and 'responsibility' which implies a new level of relationship. The ability of a product to respond, or its 'response-ability' is a key factor in high performance products such as handling in motor cars, computer performance and steps into the realm of legal responsibility (for example, the tobacco industry and public health). This reminds us that while these principles show up in the design of physical products and services they also imply a new way of thinking and can also be used as clues to changes in social thinking trends.

feedback

The most common use of this term is the idea of a 'feedback loop'. This derives from systems thinking and explorations into cybernetics in the 1950s as electronic computers emerged on the scene.

An example of a feedback mechanism is a temperature control on a heating system. When the temperature drops below a set level, the heating cuts in to boost the temperature back to that level and then cuts out.

Seeking 'feedback' from customers is now a common business practice and acknowledges the 'relationship' between producer and consumer.

interactive examples

interactive multimedia

Multimedia is shorthand for 'multiple media'. For example, the internet is a visual and auditory channel. Visually, this includes text, graphics and photographs. Auditorially, this includes voices and sounds. All together, multimedia can be a singing and dancing show as a movie or animation, as a slide show or as a game.

Television is a multiple media. However, when we watch television, the TV signal is beamed out from a central studio and everyone receives the same signal. It doesn't matter what your response to the show that you are watching, everyone receives the same channel.

Watching interactive multimedia is not enough. Being interactive, it begs for your participation and your response counts - you get to say what happens next. In a game you can win or lose, in a tutorial your participation determines your level of learning.

relationship marketing

Traditional marketing is like the television we described above: one identical message is beamed to everyone. Today, particularly with the assistance of email and databases, personalized marketing has emerged. Personalized marketing is based upon the relationship between the seller and the buyer. It's almost a return to the corner store, where the proprietor knows everyone's name and their buying preferences. The better the relationship, the more likely they will buy more from you.

CRM stands for Customer Relationship Management. There is now a whole industry based upon the management the relationship of the buyer and seller.

A relationship implies two parties. The rise in asking for and seeking Customer Feedback is an important part of building the relationship with the customer. It is also a key part of the learning of any organization, learning how to improve and enhance your business.

running shoes

They weren't the first running shoes scientifically designed to absorb the shock of running and they are the best known: Nike Air™. With a cushion of air in the heel, as you press your foot onto the ground, the cushion absorbs the shock and you receive a slight boost of energy in return. The shoe interacts with the ground you run on.

toothbrushes

Toothbrushes used to be stiff blades of plastic with an array of fine bristles all standing to attention at one end. Your toothbrush choice was usually limited to choosing your favourite colour.

Today, toothbrushes have moving parts. Some are designed to flex, some have pivoting hinges. Toothbrushes today are interactive, they respond in shape and movement in accordance with where you push and how much pressure you apply. This is all to ensure we get a better clean. Smile!

shavers

Pivoting Heads, Flexible Heads, Push-button cleaning, strips to sooth our skin. To get a clean shave is no simply about having a sharp blade. Enormous sums of research dollars are spent aiming for a 'better' shave. Shavers interact between the blade and our skin. With a face and body of irregular shape, the aim is to get the best angle of contact between blade and skin.

bicycles

Traditionally, bicycle frames were a fixed triangular shape that was intended to be stiff and rigid to resist the forces of the cyclist's body weight and the surface of the road. Today, there are a number of 'interactive' versions of bicycles.

One design includes a triangular shape that incorporates a wire member and two rigid members. The rigid members work primarily with the compressive forces whilst the wire member works primarily in tension, providing some 'give' or 'cushion' in the ride.

Another design separates the seat from the frame that connects the wheels. The rider sits upon a cantilevered horizontal beam that is designed to flex and absorb the inconsistencies in the road surface. This design separates the riders seat from the frame which absorbs the road vibrations.

Suspension on the wheel forks has also been added as an alternative 'responsive' mechanism to soften the ride.

hyperlinks

When you read a newspaper or a book, the text is printed firmly onto the surface of the page. It's not going anywhere and clicking on it with your finger makes no difference. We could say book text is passive, to be read by the eyes only.

In contrast, on a computer screen, depending upon the scripting and programming in the background, you may be able to touch the screen or click with a mouse to 'activate' the text. Linked text in this way is called hypertext. It is all part of being interactive and putting you in the driver's seat.

accelerative learning

Traditional school learning was based upon the premise that the teacher did the teaching and some students were bright and others were not. Research into brain research, perception and learning styles has revealed something quite different.

Today, this situation has almost been reversed. Now it is believed you can't teach anything, you can only create a context for someone to learn. More specifically, learning is promoted when you tap into the individual learning styles of the students. It is also promoted when the learning is based upon some form of interaction. A teacher lecturing students is considered one-way traffic. Interaction includes: games, role-playing, the students presenting the information, asking questions, discussions.

sustainable development

It is generally agreed that many of the practices of Industrial Age manufacturing and production cannot be sustained for the good of the planet. What do we mean by this? Essentially, what we are saying is if things continue in this way, it will be detrimental to the planet.

The alternative is Sustainable Development. A key aspect of Sustainable Development is the notion of completing the loop of inputs from the birth of a product to its death (from cradle to grave).

This requires a fundamental awareness of the relationships between all elements in the production cycles and a responsiveness to their effects at each level of their manufacture and use.

the internet

Links are the glue that holds the internet together. They are also the key element that provides interactivity for the user.

If we go back to the word 'internet' - it means 'between networks'. The key word is 'between' and the key to this on the internet is linking. Essentially a link is an opportunity for the web surfer to interact and say 'I'm going over here'. This can mean clicking on either text elements or images that take you somewhere else within the current site or elsewhere.

interactive innovation questions

What relationships do our products have?

Take a look around you and have a look at all the products around you. Speculate for a moment what relationship you have with each of these things. For example, how do you sit on your chair? What activities do you use your computer for? Who do you call on your telephone?

Similarly, how do each of the products interact with the environment? Do you have to put energy into using them (eg. pull open the door or does it do it automatically?)

Some relationships are fairly obvious in hindsight. Any shoe interacts with the ground when we walk in it. Yet it took the Australia company Dunlop to incorporate this relationship into the shoe design of the 'KT26'. Nike then enhanced this through their 'Nike Air' series.

Likewise, given that street lights sit out in the sun all day, it makes sense to add a solar panel and literally create 'night light' out of 'day light'. An obvious relationship gives birth to a new product.

What relationships could we create? What is the link between X and Y?

This is an extension of the question above. If you know what relationships your product currently has, what are the logical (or illogical) links that you can create with other products, events or situations. For example, what is the link between shoes and cars? What is the link between basketball and swimming?

This is all about redefining what you do and it directs your attention to new links and relationships that could form the

basis of new products or new alliances to add extra value to your product users.

For example, computer hardware needs computer software. Cars need tyres, they need fuel and they need to be repaired. Laundry powders needs clothes and washing machines.

Let's take this a little further... Most computers need desks. If the mouse sits on the desk, it needs to roll smoothly on the desk so this gives rise to mouse mats. Then, if we have an optical mouse we don't need the mouse pad. Alternatively, if we had a laptop, we may have a track ball instead of a mouse.

Do some brainstorming about the connections your product has with the way that it is used and see what need things can you come up with if you change this relationship in some way.

What difference would it make if we strengthened the connection between these things?

A toothbrush that bends and flexes is rather obvious now that it has been done. Perhaps the source of the breakthrough was that teeth are hard but gums are soft. How can we brush hard teeth without hurting soft gums?

If we bring more related factors into the equation and strengthen the importance of these connections then new opportunities will be born.

For example, our clothing performs the role of a second skin in protecting our internal organs from changes in temperature etc. If our clothes were considered as having a relationship

to our skin and to the weather, we might come up with something like 'Gore-Tex' that is a material that 'breathes' but also prevent moisture from entering. This advance in materials created a whole new range of specialist clothing, particularly suited for rugged outdoor use.

Alternatively in marketing terms, personalized or customer relationship marketing strengthens the relationship between the consumer and the producer. By knowing more about what the consumer wants, the producer can modify the design of their products to create a better customer fit.

What is the entire life cycle of the materials of our product?

If we look at the entire life cycle of our products we can event new uses for our products at the beginning and end of their product life cycles. Many examples of packaging are re-designed or re-cycled from materials in other forms.

In architecture, empty soft drink bottles have been filled with water and built into mud brick walls to create an inexpensive and thermally efficient wall system. This was clearly not part of the planned lifecycle of the soft drink company that commissioned the design of the bottle, yet imagine if it was. This would provide a distinctive new angle to the marketing of their product, 'When you've finished drinking, build a house!'

The key here is to consider your current product as merely the current use of materials and ask yourself how you can re-use the materials to create a new product. From a business perspective, also consider that you may merely pass on the materials of a used product to another manufacturer, you

do not need to own the materials for their full lifetime. For example, car tyres are now recycled as plastic bottles and simply reused as part of landscape projects.

The key here is to examine the relationships your product has in the before and after life of your end user. For example, 'Could your product be made out of someone else's recycled material?' or 'Could you provide the raw materials for someone else?'

location

This principle reflects that many of our activities are no longer location dependent.

This principle is perhaps most noticeable in the evolving workplace.

Prior to the Industrial Revolution, the majority of people worked in the fields adjacent to where they lived or worked in shops selling the wares that were typically produced on site.

During the Industrial Revolution, machinery, such as steam engines were used to create factories to produce the goods offered to the market. The factories needed workers to attend to the machines and this drew people from the countryside to live and work near the factories. The notion of 'going to work' began and our cities grew as more workers were attracted to the new workplace.

Today, it is possible for many workers to be able to perform their roles away from a central office. The use of mobile telephones, laptop computers and portable digital assistants makes it possible for people to work from home, from a car or even a café. The new electronic technologies are cutting the link to a physical office and allowing people to work independently of their business location.

This is the essence of this principle. New technology is developing that allows us to work, play and be independent of a fixed location almost anywhere on the planet.

location definitions

any product that allows the user to operate independently of a fixed location

The dictionary defines 'location' as 'belonging to a place'.

This principles is about 'location independence' or 'not belonging to a particular place'.

Another way of saying this is, the product allows you to perform similar functions in a range of locations.

location key words

global

Global Village, international, worldwide, planet, multi-national. These are all words that reflect the push toward globalization.

tele

'Tele' is a greek word that means 'far, or at a distance'.

There were a flood of inventions created primarily in the 19th century that use the prefix 'tele'. These include:

telescope = to see at a distance

television = to see pictures from far away

telephone = to talk at a distance

telegraph = to write at a distance

telegram = a message sent by telegraph

telecommunications = to communicate at a distance

mobile

A mobile phone is a telephone that is not fixed to a particular location.

wireless

Cordless and wireless are similar. Cordless drills and cordless phones make it that much easier to take your tools to where you want to go.

The original wireless, was a transisitor radio that didn't have any wires. Now wireless usually refers to computers than have connections, such as infra red, using signals transmitted through the air rather than having to physically connect with wires and cables.

fast

Fast food is food so fast, you don't just 'take away', you're likely to 'drive through' when you buy it without getting out of your car. If something is really 'fast' it may be too quick to stay in one location.

mini

Mini is short for 'miniature' or 'miniaturization'.

With the advent of transistors and then silicon chips, electronic devices were able to be shrunk in size. Thus as new products were developed in line with advances in electronic circuits they became 'mini' versions of earlier models.

micro

Did you hear about the electronics company that became so successful they had to move into smaller premises?

When 'mini' isn't small enough, you become 'micro'.

wearable

Originally computers filled rooms. Then they sat on desktops. Then on your lap (laptops) and now they fit into your palm (palmtops). Next is computers that you can wear. One

version of this is the Dick Tracey telephone worn on your wrist. Another version is the creation of flexible threads that enable an electronic device to be worn as an armband or on a belt. Take a close look at the next jogger or rollerblader that goes by and see if they are wearing a stereo or even a mobile phone. This is merely the beginning of the wearable product line!

portable

A laptop is a portable computer. It has its own set of advantages in that you can pack it up and take it with you.

compact

Another variation on getting smaller is compact. Literally it means a smaller version of something else. A compact disc or CD was a compacted version of the long play record.

voice

Voice is the next big thing in computing. Coming soon is voice control that enables you to activate your products into operation. For example, a call on your mobile phone to turn the heating on.

Voice will accelerate this trend even further, particular in the office environment. Currently we need desks to perform most of our computer functions because we need to put the computer somewhere flat. If we only use voice activation, the need for the desk is diminished opening up another new places from which to work.

The difference between your telephone and voice activated products is that your telephone doesn't know what you are saying, it merely transmits an anonymous signal. The voice activated system needs to be able to decipher what you are saying so that it can perform the actions you ask.

location examples

walkman

The Sony Walkman was a breakthrough product that derives from thinking that runs in parallel with this text. It is also a great example of a 'location' product and shows what is possible with a little clever thinking. Technically, speaking, the Walkman was not spectacular. The true genius was to pick up and run with the idea of having a portable stereo system. The Walkman demonstrates what is possible by translating existing products into new forms in line with the ideas in this text.

The Walkman was also able to translated into the discman when CDs became popular and is now in the form of the minidisc using an even smaller cartridge.

mobile phone

Previously phones were attached to a cord and you generally needed to be inside a building to use them. Now with mobile phones the question is not 'how are you?', the new question is 'where are you?' This highlights how new products alter the way we think.

For most of us, the only limit to our mobile phone usage is the telephone coverage provided by our service provider. If you want total global coverage you might have to upgrade to a satelite phone.

telephone

Can you imagine how weird it must have been to be talking into a little round plastic thing and hearing your mum on the other end when you knew in your head that she was 1000 miles away on the other side of the country? Today we think

nothing of using a telephone or merrily chatting away to someone who is on the other side of the planet.

Do you know the origin of the word 'phoney'? Can you guess?

Yes, it does come from the early days of the 'telephone'. It refers to the general distrust of phone conversations, they were considered 'phoney' conversations. Today we don't think twice to trust and rely upon our phone conversations but we still use the word 'phoney' to mean 'false or fake'.

Today our closest experience to this is e-mail. Of course e-mail is not a 'real conversation' - or is it?

global thinking

Technological shifts also create a shift in our thinking. The term 'global thinking' refers to thinking in terms of the big picture or the overall context.

voice recognition software

The most common uses of voice recognition software the moment is through dictation software. As the machine learns your pronunciation patterns you are can simply speak into your microphone and your computer does the typing for you.

The days of being lonely in your kitchen are almost over as soon you be able to talk to your appliances.

banking

Banking used to be about physical places. Now banking is about access points. You can access your bank via a phone, the internet, your credit card, at the supermarket via and

EFTPOS machine (Electronic Funds Transfer – Point of Sale) or at a 'hole in the wall' (ATM = Automatic Teller Machine).

Is it any wonder banks have been closing branches? Banks traditionally were one of the biggest real estate owners in the country. Now they have become part of the electronic network they no longer need to tie up their money in property investments.

global time

The Swiss Watch company 'Swatch' have developed a new time standard – Internet Time. It breaks the current 24 hour clock into 1000 beats and was established to cater for a global market and eliminate geographical time zones – perfect for the Internet. The international headquarters of Swatch is located in Biel, Switzerland and thus the Biel Meridian Time (BMT) where the time system is set. At midnight in Biel, internet time is @000.

other examples

Telecommuter = A worker who works from a location other than a central office and typically communicates by telephone, fax and email. They literally commute 'at a distance'.

Caravan = A caravan is also known as a 'mobile home'. The traditional version was a fleet of camels with a makeshift village of tents caravanning through the Arabian deserts. The modern day version is literally a home on wheels that can be shifted from one location to another.

Globalization = Perhaps the most powerful demonstration of location independence is globalization which reflects a thinking and acting in the world as if there are no country borders.

Global Positioning Systems = An electronic system for pinpointing your location anywhere on the planet based upon satellite technology.

Multinational Corporation = A large corporation with offices and operations in a number of countries and regions representative of the push toward globalization.

Laptop Computer = In contrast to a desktop computer where you need a desk to sit the computer upon, a laptop is portable and is literally a computer that can be used sitting on your lap.

Home Office = A home office is an office in the home. The worker no longer has to travel to the workplace. In other words, the worker is located independently of the corporate office.

Live Sport on TV = Live sport on TV enables a sporting event to be viewed without your being at the same place at which the game is played. (This is also an example of 'virtual') The viewer views the game independently of where the game is being played.

the internet

File Access = the same files can be accessed from anywhere in the world. For example, you can receive your email from almost anywhere. Similarly, web pages can be accessed from any computer.

Phenomenon = the internet is a world wide phenomenon

Global Uniqueness = internet addresses are unique around the world, ie. email and website (This is also an example of 'Personalize')

location innovation questions

In what ways is your current product bound to a location?

This is an interesting question that may be more obvious than we think. Here's some things to consider...

If your product is large or heavy it is probably rarely moved. For example a desktop computer. What would happen if your product was smaller or lighter enabling you to move it with ease? A laptop computer could enable you greater freedom, or extending this further, how about the mobility available with a palmtop?.

Does your product need to be connected to another product that is fixed in place? For example, a desktop computer needs to sit on a desk because of its size and because of its need for electrical power. Typically, it is also connected to a printer, etc. If you could cut these connections through batteries and wireless connections then you would be free to work almost anywhere.

This idea of connection may be less obvious. One of the early things that held back motor cars was the lack of suitable roads to drive on. With hard suspension, solid rubber tyres and an uneven road, the early motor carriages literally gave the passengers a good shake. Taking this one step further, the birth of the airplane broke the connection between motor driven transport and the ground and created a whole new mode of travel and a significant change in our relationship to time and space.

What about functional connections? Desks are usually a certain height because we sit at them a particularly. In

comparison a bar is usually higher because we stand, lean or sit on a different chair when using them.

Does the product only work in relation to something else? For example, a writing with a pen requires a flat surface which is often a desk. However, voice dictation through voice recognition software allows the user to be anywhere within earshot of the microphone and no desk is needed.

The key to this question is to identify the connections your product has to other things that keep it locked in time and space. When these connections are cut, the relationship to time and location will change also.

If your product could be made ten times smaller, what difference would this make?

Two popular examples come to mind here.

Firstly, the Dick Tracey phone watch with television screen.

Secondly, the story of the movie 'Fantastic Voyage' where a team of scientists are shrunk to micro scale and take on a fantastic voyage inside another human being in a miniature submarine like vessel.

Whilst this question is intended to be provocative for the sake of brainstorming, advances in micro-electronics and nanotechnology may make this a serious question to consider in the not-so-distant future.

What would be available for your product if it was 10 times smaller?

If you could control your product through voice commands, what difference would this make?

Consider, what it would be like to drive your car without a steering wheel and merely through voice commands. Would this be an improvement or not? What would be the downside of this?

What about your computer? If you could sit back and simply talk it through your letters would this be good? Instead of reading your emails would you prefer your computer to read them to you?

If you could control your product through remote control, what difference would this make?

Most of us are probably familiar with a remote control for our television, perhaps our stereo also and maybe our garage door. Where else would this be useful?

Through internet connections, medical specialists have begun to perform remote surgery with the patient in one location and the operating team elsewhere controlling the operation through computer controlled lasers and the like.

Currently, researchers are working to create an automatic car. Not automatic simply in the choice of which gear to drive in, automatic driving without a human being on board. If your car was remote controlled you be able to keep working and pick up your kids from school at the same time.

What about a remote controlled lawn mower? It could almost be as much fun as playing with your favourite video game.

A related question to this is, what difference would it make if your product was linked to the Internet? What levels of remote control would this allow for?

personalize

In direct contrast to the standardization of the Industrial Age, information based technologies allow for infinite variation and promote customized or personalized products to be produced.

Henry Ford's production of the motor car epitomizes the standardized approach. He proudly boasted that you can have any colour Model T Ford you liked, as long as it was black! Also, his production line churned out an unchanged Model T Ford design for over 10 years. Today this would be a recipe for disaster.

Television is another example of a standardized product with each viewer receiving the same message. In contrast, the Internet allows each viewer to create their own individual channel (website) and view their own path of discovery as they click from one site to another.

In contrast to Ford's production line, 'personalization' has also shifted to the manufacturing arena. Dell computers personalize the manufacturer of your computer by allowing you to select the specifications and then assign a code number to a specific computer that is made specifically to your order.

personalize definitions

any product specifically created or designed for one or only a few people

To cater specifically for an individual.

The key here is the contrast to standardization, when the same product with the same specifications is made for many people.

Personalization means that the product is tailored in some way to meet the specific needs of an individual customer.

personalize key words

personal

This is an obvious one! 'Personalized Service' is a common example.

custom

Very few of us go to a tailor for a customized fitting of our clothes. Alternatively consultants often talk about customized or tailored solutions individually developed for the client's specific needs.

individual

Another obvious example here.

DIY

DIY is shorthand for 'Do It Yourself'. This is a special case of personalization where the user performs the task themselves and in this way is able to customize their own solution to their own needs. Perhaps DIY is the ultimate in personalization since you get to choose how you do it - unless of course you choose to have someone else do it for you.

niche

In contrast to 'mass' as in 'mass media' which presents the same message to all viewers and listeners, niche markets specifically target a selected group of people. In most cases magazines are niche products (eg. a fly fishing magazine) versus a newspaper that provides a wide selection of issues.

bio

'Bio' is short for 'biological' or 'biometric'. Essentially this refers to a process that recognizes your individuality at a biological level. 'Biometric' means 'to measure biologically'. A common example of this is fingerprinting used for the past hundred years to track criminals. The development of iris scanning (the equivalent of fingerprinting using your eyes instead) is emerging as a possible security standard for the future.

unique

This is often used as a way to distinguish from other similar items, particular in terms of new products. Often this is over used as a marketing term where the products are effectively the same except for some minor variation.

self

A common example is 'self-service' which fits inside the DIY banner.

personalize examples

motor car

Compared to a bus or a train that follows a prescribed route, a car is a personalized form of transport in that you can take your own personal path to your chosen destination.

Alternatively, most cars are standardized issue when they roll off the production line.

self serve

Self Serve was a revolution when it was introduced into the local grocery store about 50 years ago. Previously, customers were always served by a store attendant who typically made the every purchase a social occasion. Today, the cost of wages means that a viable alternative, particularly when price is an important buying point, is to create a system for customers to serve themselves. This allows the savings in wages to be passed onto the customer and eliminates one social aspect of shopping.

Today we see self serve translated to petrol (gas) for cars, salad bars at restaurants and in banking through automatic teller machines (ATMs).

personal computer (PC)

In the dark old days of computing, they were really large monsters that filled up entire rooms. The birth of the computing revolution in the early 1980's was sparked by designing a computer that could be put in a box and sit on a desk.

These computers were promoted as 'personal' computing as a marketing term to create the demand for each person to

buy their own computer. This is in stark contrast to the words of Thomas J Watson, chairman of IBM who said in 1943: "I think there is a world market for about five computers." Clearly he wasn't able to see 40 years into the future to see the application of this principle to his product!

relationship marketing

Relationship marketing, often coupled with Customer Relationship Management software (CRM), aims to sell you products through establishing a personalized relationship between you the consumer and the manufacturer.

One example of this is when you sign up for a service on a website that then greets you by your first name each time you log onto that site. Amazon was one of the early adopters of this technology and each time I visit I receive a 'Welcome Geoffrey' as well as a list of suggestions on what I might like to read and buy based upon my previous purchases or stated interests.

niche marketing

This implies that you are deliberately targetting a small and selected audience. For example, most small retailers sell a small range of products catering for a specific market need. In contrast, department stores aim to sell almost everything.

personal capital

In the workplace there has been a big shift in how we relate to our employees. Previously our staff were merely the workers and fuelled the growth and profits of the company. Today, there is much more talk about personal capital meaning the

wealth of knowledge and expertise that you personally bring to the company (personal intellectual capital).

Similarly, a new way of looking at your personal career is to consider, 'What personal capital am I offering to the organization?' and 'How much is my personal brand worth?'

time

A classic example of standardization is 'time'. Whilst most of us relate to the clock as gospel, we often forget that time, as in our 24 hour clock is a manmade structure. Time in this context was standardized to enable people to co-ordinate actions between each other.

Creating 'personalized' time does not mean making up your own system of telling time, rather it is a recognition that we operate in our 'own time' and it is important to have some 'time to yourself'.

personal digital assistant (PDA)

A portable electronic device for storing your personal details. As the name suggests, the intention of this device is to provide you with your own personal assistant. In this case it's a digital assistant that allows you to manage your own affairs quickly and easily.

design your own (DYO)

The Do It Yourself trend was driven by the availability of electric power tools and enabled everyone to become a home handyman.

Today with the assistance of computer technology, the DIY trend is being applied to the professions. In legal circles we have the DIY will, in the pseudo-psychology fields we have

self help books and seminars and the increasing shift from traditional medicine to alternative medicine is indicative of people looking for self-healing.

Design Your Own (DYO) refers to the application of DIY to the design fields such as graphic design, web design and architecture. Software is now available to make these tasks much easier for the non-trained person. Whilst they

don't make you a design genius, they certainly make design more accessible.

A second part of this trend is the increasing emphasis on designing your own living space. A flood of homestyle and home decorating retail outlets now cater for this trend. One of the world wide suppliers in this field is the Swedish company IKEA. They do the designing, you select the pieces, take them home and assemble them and create your own living spaces.

the internet

(1) **URL** (Universal Resource Locator): Each website page (and there are over 100,000,000 of them, has a unique page reference that defines the location of that resource. Your domain name (such as www.designprobe.com) is the key to the system. Likewise your email address is a personalized and unique address so that when an email is sent to you it goes only to you.

(2) **Personal Website**: In contrast to the resources required to create your own newspaper, radio or television channel, the world wide web enables each person to create their own media channel. ie. their own personal website.

(3) **Unique Paths:** Each visitor to the world wide web chooses their own path to follow as they surf through individual websites and across the entire internet. This is in direct contrast to watching television where the choices are limited to the channel you choose to watch.

(4) **Personcast:** A traditional radio or television presentation is considered a 'broadcast' because it is a single message cast as broadly as possible. The internet is a personal channel and a telecast directed at a single person or a small group is called a 'personcast'. This may be used in business to circulate private documents or video footage to a select audience.

personalize innovation questions

How many different ways is your product standardized?

For example, consider the building of a house. Whilst an architect may have designed your house individually for you, there are a number of levels at which the design has been standardized. This could include elements of the design the architect has used in other projects all the way through to the number of standard elements that are repeated or used directly 'off the shelf' and assembled. For example, it is likely the door knobs are selected from a range in a catalogue or your carpet was bought from a sample of readily available colours and designs.

Likewise, whilst you probably had some choices in buying your car, it is unlikely the whole car was personally designed for you. What if your car was personally designed?

Do you often find it hard to find clothes that fit? That's the downside of buying standardized garments off the rack. How would it be if all your clothes were created just for you fitting every bump and curve of your body?

Make a list of the standard components of your products. Consider, one by one, each standard element if it was personalized to the customer and not what difference this would make.

An intermediate step to from standardization to personalization may be 'limited editions'. Consider the success of the Swatch watch was partly due to the limited editions of each design they created such that it spawned a host of 'swatch collectors'.

If you changed each of these 'standard' practices into a personalized response, what difference would this make?

Okay, now that we have identified a range of 'standard' practices, what difference would it make to personalize these? In some cases there will be no apparent advantage to personalize things.

For example, perhaps the most important standardized product we have is 'time'. Having an 'official' time is a made-up human invention designed to co-ordinate our actions. If we agree on the time, we can agree to meet at a particular time. If there is no standardization of time, it makes it difficult to co-ordinate our meetings efficiently. Having your own personalized time may not be a good idea.

Alternatively, having a personalized diary makes perfect sense because we all use our time differently and we all plan our time in different ways.

Consider, instead of a 'Big Mac' the same the world over, how about a personal hamburger designed just the way you like it from any McDonald's outlet around the world. Now that would truly be a personalized product.

What products are currently handmade? How can these products be individually made by machines?

This question prompts a link to automation and 'intelligence'. The potential of automation is to be able to produce goods at

any scale with each one being customized. If you can create the way for these to be manufactured you could be onto a winner.

One suggestion around this to make your task a little easier: consider a 'virtual' equivalent. Don't make a literal translation, translate the effect of the product or the effect of the personalization.

For example, Dell computers offer you the opportunity to personalize the components of your computer. Rather than buying standard models off the shelf you can specify what you want. They even personalize the manufacturing process by assigning your computer an individual code number and you can track the status of your individual computer as it is being assembled. What appears to be a personalized process at one level is not at another. The trick here is that Dell are using a range of standardized products and assembling them into new configurations. Dell Computers simply offer enough choices to the consumer to appear as if each one is customized. You could say this is 'virtual personalization'.

How can you make your product unique?

Today, all you need is around a billion dollars and you can create your own car manufacturing plant. Whilst there is a great range of manufacturers and designs, all the top makers are building standardized solutions that produced in various mass production quantities.

What about a personalized car design? For example, this could be a personalized colour scheme or a personalized and official badge on the side of the car.

How can you make your product unique in a sea of standardization? What small change could you make so that your customer feels like they are getting something special and unique?

Remember, a unique product can be charged at a premium because there is no competition.

virtual

'Virtual' literally means 'to have the effect of, though not actually being so'.

You could consider a print of a famous artwork to be a 'virtual copy' in that it has the appearance of the original but none of the qualities of texture, paint, being hand-made, being unique, etc.

As you might expect, examples of 'virtual' often include the term 'virtual'. For example, 'virtual reality' refers to a computer based reality experienced by a computer user often wearing goggles to 'see and hear' another world. Other examples of 'virtual' include: virtual classrooms, virtual corporations and virtual communities.

The common thread in each of these cases is that they mimic the 'real' or 'traditional' classroom, corporation or community in some ways and not others.

virtual definition

any product designed to give the effect of another product.

The term virtual means: 'on effect, though not in fact or by strict definition.'

The distinction 'virtual' is a very interesting one. If we consider all technologies as an extension of the human that created them, then we could consider all technologies to be 'virtual'.

For example, if the wheel is an extension of the foot we could call it a virtual foot. It is not a foot and it gives us the effect of a foot enabling us to travel over varying distances.

For me, with a background in architecture, clothing and buildings as an extension of our skin is a useful metaphor. If we look in more detail, our skin is the envelope that protects our inner organs and modifies the effect of weather to keep the body temperature relatively stable to enable us to go on thinking, growing and living. Clothes form a similar role in that they modify the weather allowing us to live in a much wider range of climates than without them. (Living in Europe in winter without clothes would not be a lot of fun!) If we take this one step further, buildings play a similar role.

virtual key words

virtual

The only real clue to 'virtual' products is the rather predictable use of the word 'virtual'. Unfortunately, the use of this word is rather limited.

other words

Given that all technologies are ultimately 'virtual' in nature, here is a couple of key ways to envisage new products with this line of thinking. Again, the key is when something else is being replicated in a new way that captures the effect of the original but is not actually it.

Artificial - anything that is not the 'real thing' is a re-created version of it. For example, 'artificial intelligence' is not 'human intelligence'.

Manmade, manufactured - anything that is not natural and is 'man-made' or 'man-ufactured' gives us a clue that it is a new version of something else. For instance, 'manmade' and 'manufactured' are often used to describe new materials. For example, zircons are manmade or artificial diamonds. At the supermarket you can buy 'manufactured meat' which is made up of meat products but is not meat in its natural form.

Electronify - most examples of 'electronify' give clues how new products are developed from existing products. For example 'e-commerce' is still commerce, simply done electronically. In other words, 'e-commerce' is a virtual version of traditional commerce.

Online, Cyber - following from the example above, many new ideas for the internet, often preceded by the terms 'online' or 'cyber' are internet versions of something else.

virtual examples

Some of these examples are not necessarily new products and they are offered as 'classic' examples that exemplify 'virtual' in its many disguises and forms.

swimming pools

A swimming pool is a 'virtual lake' - they enable us to have the advantage of swimming in water without the inconvenience of needing a natural water source.

aquariums

Large scale aquariums offers us the experience of 'virtual scuba diving' without getting wet and without any need for training. This is particularly noticeable in the aquariums that enable you to walk through glass tunnels with the fish, sharks and rays floating over and around you.

telephones

Telephones are personalized and 'virtual loudspeakers' - I could have a conversation with someone at a distance without a telephone but this would be limited to how loud I could yell. So instead of yelling, a telephone lets me have a personalized conversation with someone at a much greater distance including on the other side of the planet!

time and money

Two of the classic examples of virtual products are 'time' and 'money'.

Whilst we don't normally consider 'time' to be a product, it is a thing invented by humans and there are a number of products related to recording or measuring time. 'Time' is

a virtual product because it has no 'real form'. A clock for instance is not 'time', merely a measurement of time and it may not even be accurately aligned to the 'real time'.

Money is a virtual product because it represents something else.

Let's consider this with a literal example. I can walk into most shops in my neighbourhood and put a thin slip of plastic* on the counter and walk out with an ice cream, a coffee, a newspaper and a whole host of other things. The value of my money is not based upon the cost of printing the money, it is based upon the commonly agreed conversion rate of the product I'm buying.

*All bank notes in Australia are made from plastic.

television, cartoons and photographs

Television, movies and photographs are virtual experiences.

There is a famous story about the artist Pablo Picasso that illustrates the virtual effect of photographs.

Picasso was seated in a café and a stranger walks up to him and says, "Why do you paint like that? People don't look like that. Why do you paint like that?"

Picasso replied, "What do you mean?"

The man then pulled out his wallet and a photograph of his wife. He looked at Picasso and said, "This is my wife, that's what people look like."

Picasso looked closely at the photograph and then said, "Your wife is very small and very flat."

If we looked at a photograph in a literal way, it is merely some chemical emulsions on a plastic film.

Television literally is an excited electron methodically walking across a picture screen.

Cartoons are literally separate pictures flashed before our eyes at such a rate that we think they are connected and the image 'appears' to move.

Virtual products give the effect of something. In each of these cases, the photograph, the television and the cartoon give the effect of movement and 'real' images and people being shown across our screens. For anyone who has cried whilst watching a movie the effect is most certainly real!

virtual banks

Traditionally banks were buildings and you walked inside, waited in line and then deposited your money with a real live person standing behind a counter. Now, with the electronic transfer of money, banks are everywhere! An ATM (Automatic Teller Machine) and EFTPOS facility (Electronic Funds Transfer at Point of Sale) are effectively virtual banks.

WYSIWYG

"What You See Is What You Get" is a software term that means what you see on the screen is what the finished item will look like either when printed or viewed on the screen in its final format. Not so long ago, when computing power was significantly less than it is today this was not always the case, you were often presented with a different view. For example, in 3D rendering software, you typically had to work in wireframe view and then look at a fully rendered image occasionally because most computers did not have

the power to quickly show the fully rendered version as you edited it.

This points to the fact that this is a virtual phenomenon.

As I type the keys on my keyboard in typing these words, what I see on the screen is the words that I typed. As a computer user we think this is normal. However, as a computer programmer the task is to convert the electronic binary switching of the computer hardware into computer code that produces that effect of words appearing on a screen.

WYSIWYG gives the effect of the letters I type on my keyboard appearing on the computer screen.

spellchecking software

Spellchecking in word processing software is a virtual application. The software does not actually know if your word is spelt correctly, it merely compares the word you have typed with a list of words. If the word you have typed is not in the list, the program highlights it as if it is spelt incorrectly.

The effect of this is so convincing that we often complain when a typo is spotted by someone else 'I checked it on the spellchecker' but unfortunately, they are only virtually right!

video games

Video games are like television in that they are merely coded instructions that cause an effect on a screen. As the player of the game, we respond to what we perceive is going to happen on the screen. In many ways, video games are the

forerunner to what we consider to be 'virtual reality' with the headsets and hand controls.

virtual corporation

A corporation that has little physical presence. Traditionally corporations could be seen in the real world based upon the size and shape of the bricks and mortar building that houses their staff. Today, many corporations are fronted solely by their websites, for example Amazon. Whilst Amazon has extremely large warehouses full of books, the customers do not see this. Amazon is effectively a virtual corporation because almost all the customer interaction with the company is via electronic means, either website, email or telephone.

virtual community

A community that exists primarily in cyberspace (online). For example, a global network of scientists may meet on an online forum regularly but never meet each other in person. Chatrooms are another example of a virtual meeting place for like minded individuals.

artificial intelligence

The intention of artificial intelligence is to give the effect of a human being thinking. The Turing Test is often used to determine whether a computer can be seen to think like a human. In this test, a human has a blind conversation with either a computer or another person and has to determine to whom they are speaking.

virtual office

An office that has little or no physical presence is a 'virtual office'. This could refer to a home office or a temporary office.

virtual innovation questions

Select a product. Describe the various effects that it produces.

This requires some speculations and some brainstorming. For example, what effect does advertising have? This is a very potent question. Some responses may include: advertising persuades us to buy things, it persuades us to think differently, it adds colour to our city streets, it adds 'visual noise' to our city street, it fuels the sales of products and helps the economy, etc. Aim to consider the widest range of effects you can and include effects that may or may not be useful.

How can we produce the same effect through different means?

Following from the question above, how could these effects be produced in a different way? For example, to use the advertising examples once more. If advertising was considered to 'add visual noise to our city streets', how could advertising accomplish its objectives of promoting a product AND add something of considerable value to our city landscape? This may encourage a brainstorm around what would be 'considerable value'. An ideal solution in this case would satisfy the advertiser that the product message is getting across the consumer as well as satisfy the residents that the advertisement adds to the public amenity.

A good place to look for producing the same effect through different means is to consider an electronic equivalent to the current product.

What is the equivalent of this product in electronic terms?

There is a strong link between 'electronify' and 'virtual'. If you could simply convert a non-electronic product into an electronic version you can create a virtual effect. Remember, this is not a literal exercise.

For example, IBM the computer company are currently working on developing a 'virtual passenger' for motor cars. Before you read on, stop for a moment and ask yourself, 'what would a virtual passenger be?'

The clue to this is that IBM are a computer company. They are currently working on voice translation software that will talk with a car driver to keep them alert and awake when driving. The objective is not to create a literal passenger, simply to create the equivalent of one. In other words, to give the effect of having someone to talk to.

What if there were no people involved?

Now this is probably a weird question to consider. Let's explore it further.

Ultimately all products are designed to be used by people in some way. For example, even dog food is designed to be given to the dog by its owner. Now let's consider this if the human element was taken out or at least mostly taken out.

In the case of dog food, if the owner was away, the dog food could be packaged in a way that it was self opening at a

set time each day. The owner simply leaves the package of dog food in a safe and secure spot, sets a timer and leaves. When the timer reaches the right time, the lid of the dog food package pops open and the dog can then eat its food. This could be the basis for a 'virtual dog feeder'.

The key here is again to start with the effect you want to create and then speculate on how that effect may be created through a completely different medium. The key here is that we can add 'voice, image or movement, smell and touch' through electronic or chemical terms thus simulating many of the contributions a human being may make in any given situation.

more information

how to design innovative new products

If you are serious about exploring these ideas further and designing your own innovative new products you may be interested in inviting the author, Geoffrey McDonald and/or the designprobe team to undertake a keynote presentation, workshop or consulting services.

Keynote Presentations

Stimulate, provoke and inspire your team or your industry colleagues with a keynote presentation personalizing the 7 design principles to your industry or business. Each assignment is individually researched and you can choose between a lecture style presentation or an interactive discussion.

Workshops

Learn how to apply the 7 design principles to your situation as both an analysis tool for tracking trends in your industry, and as a generative tool for creating new products. Choose from a one-day introduction through to a 5 day program.

Consulting Services

Design your own competitive advantage through a personalized consulting program tailored to apply our broad design expertise with your industry specific knowledge and experience. This may range from revamping your existing products or creating entirely new products and industries. Every consulting program is individually tailored to fit your budget, time and outcome.

designprobe

designprobe is a design research company based in Melbourne, Australia. Our work consists of three main areas: design research, design trends and design products and services.

Design Research

Our unique Design Research focuses on making art based artifacts as the building block for creating new and innovative designs.

Design Trends

'Every New Product' is an example of our design trends service. Our focus is to track technology and observe how this creates new design possibilities, particularly at a conceptual design level with the allure of creating new and innovative products.

Design Products and Services

Rather than simply research about design, we also apply what we learn through the creation of innovative design products. We also offer a range of workshops, speaking engagements and consulting services for you to learn how to be innovative in your workplace and how to apply the design trends to your situation.

For more information, visit designprobe.com or email the author at geoff@designprobe.com

your contribution

We are also keen to incorporate your comments and suggestions to make this publication more potent and easier to use. We are also open to include any suitable examples you may like to offer. This includes any current products you and your company may offer that are strong examples of these principles.

If you have any comments, suggestions or examples (including your own product ideas) that you think we could incorporate in future editions, email them to the author: geoff@designprobe.com

updates schedule

In keeping with the tradition of software, this is only the current version, we will be adding new examples, revamping the text and improving the layout over time.

Keep up to date with the latest issue by visiting: www.designprobe.com

If you would like to be kept upto date with the latest changes, subscribe to the designprobe' newsletter. This is a FREE service.

Version 1.3 (Jan 2003) Addition of Innovation Questions, minor text amendments.

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about the author

Geoffrey McDonald began exploring technology as an architecture student in the early 1980's.

"My vision up to that time was to have a big architectural practice with lots of staff and drawing boards everywhere. In 1984, I saw a video about computers and speculations on the impact they would make on design. This video left a lasting imprint on me. After several weeks pretending that it would make no difference to my future, I faced up to the picture that computers were going to take over from drawing boards. I didn't really know what difference this would make, I simply knew it would change everything.

"I came to the conclusion that if computers were going to have such an impact, then I had better find out what impact that would be. I have been finding out ever since.

"Along the way, I have completed a Masters degree in Architecture, worked in architect's offices, learnt 5 different computer aided drawing (CAD) packages, spoke at leading international design conferences, studied visual art as a research method, wrote and published several books and ran an internet design business.

"I have also collected a considerable collection of newspaper and magazine articles that highlight these principles and technological trends. These are now being compiled into a single database.

"The framework offered in this book, I have been using for more than five years to track trends in design and technology. Generally, this has proven to be a very simple and effective

way of tracking what is going on in the world, explaining why particular issues are showing up and also spotting potential product failures because they are inconsistent with these principles. Finally, I now offer it to you for your use.

"Enjoy the read and if you have any comment or suggestions for revised editions of this text, please email me at: geoff@designprobe.com."

Thanks!

Geoffrey McDonald

To view ongoing updates to this and other work, visit our website: www.geoffmcdonald.com