

Brainy Architecture:

The search for the sublime in the information age.

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No matter that you grab hold of your chair, I move the entire building into another co-ordinate system within a new society. A society based upon knowledge. At the end of this journey everything will be changed and there is no undo button. It is as when Copernicus moved the co-ordinate system from the earth to the sun and pow! Kepler explained the motions of the planets in terms of elliptical orbits and Newton followed up with the rest of the universal laws of physics that became the basis for the industrial revolution. I move the co-ordinate system from the building directly into your very brain. The brain is our centre for experience and here we can't tell if experience is something that is based upon the senses, fantasy, dreams or something else virtual or physical.

The measuring stick for architecture is changed from m², kg, °C, lux and \$ to the measuring stick of the brain: " a difference that makes a difference". Our senses react to differences. Changes to the stimulation of the nerves. We are blind to continuous stimulus. The brain reacts to differences. Sensation. Man bite dog. Something that is different to that which we knew before. Knowledge is a model structure in the brain. Familiar information makes no impression because it is already there within the model. It is the new and surprising that counts. I focus on the sender and receiver instead of bits and bytes. Information is increased when the sender has structured and compressed his message (difference no.1) to have a meaning of value for the receiver (difference no.2).

But wait a minute! Architecture has now become an information filter between the user and his surroundings. An interface between man and his world. It is not just a trick. It is a difference that makes a difference for you too. It makes a difference to your next building. To your life. It creates holism out of chaos and structures our interaction with each other, our surroundings, as well as with ourselves. So lets take a look at the ten differences that make a difference:

1 Man in the centre

The aim for architecture is for man to prosper, develop and contribute. It is necessary then to place man as the focus instead of the building, which is only the means unto an end.

We people are all very different. It is not a problem. It is a resource. The difference between people is the secret to the development and safekeeping of a good solution. From the biological and genetical development of species to the development of new ideas. There would be no need for

communication or even information without differences. It makes no difference to find out about something you knew already in the first place.

Beauty in building shouldn't be the greatest when in a virginal state of preservation as some would have it, but when love, friendship and co-operation is manifested between the people that inhabit them. Human development and interaction is both the starting point and the objective and we stand on the edge of an epoch where this vision is about to base itself in the best economic interests of our knowledge society.

The concept of information involves all of the senses. Sight, sound, smell, touch, taste and sixth senses too because it is a difference that makes a difference in your brain that counts. A candlelit dinner is a metaphor and an example of a situation where all of the senses are stimulated in the brain. It is precisely through the conception of a difference that makes a difference that the notion of stimulus becomes a determining factor. The wild and exotic, the different and unusual.

However, such stimuli do not by necessity need to be connected in any way or adhere to any particular place or order. The city is an example of a situation where we do the choosing between what senses we wish to stimulate and where to go for that wish to be fulfilled. To stimulate the sight and sound we go to cinema. To stimulate human contact we go to a café. To stimulate our taste we go to a restaurant. Likewise when we go shopping.

2 Common language

Information is the common language for all disciplines in the knowledge society. There is no longer a separation between the hard analytical world of the physicist and the soft intricacies of the humanities. All knowledge disciplines have a common language just as HTML is that of the internet. They can talk to each other and be stimulated by the potential of transfer from one discipline to any other. Everything is to be accessible via the information highway. See, think, react, contact, stimulate, grow. Taste is suddenly something we can discuss when we can translate it into a common language.

Each year sees the birth of new disciplines, increasing specialisation and deeper understanding, but we miss something to bind all of this together. A common language, a universal relationship. The common denominator is that we create products for human use and consumption. We humans have senses and thinking in common. Our common language is that of information, a difference that makes a difference. The condition for a holistic parallel representation within an equal and concurrent process is the use of a common language. Not just an actual language as in English or a digital language, but something that can compare both hard and soft data and something that can be used to find a win-win formula when conflicting interests confront one another.

Creative thinking and an increase in knowledge can be furthered through conceptual understanding. Group creativity and collective intelligence is increased through communication. This means that the greater the number of concepts, pictures, metaphors, graphical communication, mimicry, sound impressions, smells, feelings etc. one understands within a group and can communicate to each other, the more creative the outcome of the processing of these stimuli. Since the purpose behind meeting each other in our knowledge society (instead of working from home) is precisely to create something in company with others, the most effective forms for communication become essential in making this productive.

We play a role and have roles. This role-playing can be changed from something that limits communication to something that improves it. A conscious attitude towards communication as improvised theatre can increase the bandwidth within communication. We want to create an architecture inspired by the theatre, where it is easy to take oneself inside and play a role, make new scenes, create new performances.

3 The filter

In the physical entirety of a building, the perception of information is to be considered as noise to be screened. But if we consider architecture as an filter/interface for information then we are able to sort, distil and organise. Information has input and output, resonance, frequency, strength and many other functions. It is all about choosing the information we want and maximising it.

We can already view the world through many kinds of physical and virtual optics. Through our spoken language, our profession, our roles as parents, as colleagues, through our national culture and our sub-culture. We recognise directly through our senses, but also through TV, the Internet, books, films and forms of art. They are collectively a kind of filter/interface that reinforces certain impressions whilst repressing others.

This new recognition is the same in its effect as going from switching an electric bulb on and off to experiencing multimedia. The architects and the users roles are directed towards taking a certain view of the screen , a cut from a film, a moment of three dimensional sound. To build-in a filtration of information by selecting the desirable and excluding the non-desirable.

A double function as filter and interface is repeated on many levels in accordance with the individual, family, group, institution, sub-culture. The point is, that the building perceived as filter protects the kind of privacy or company you want. To screen in order to accentuate. To stop a particular stream of information in order to concentrate upon a particular task at hand. Only this kind of informational filtration can make it possible to function in a society with an increasing flow of information.

The home is the place in the world where you yourself decide on the nature of the filtration of information. A private life is a right to decide about information. Many people 'solve' their social problems through isolation and retreat. Turn off the flow of information completely. They sit in their own space and work alone. This is of course, more a problem than a solution and raises questions as to the importance of contact between people and the nature of that contact. The alternative to isolation is fellowship and tolerance. The last in particular is a worthy virtue. Differences between people can be a resource and the key to experience. We don't need to find the same solutions, but can instead find holistic models that represent our differences. We need to develop an architecture that doesn't just make do with difference and complexity, but uses it as a productive tool instead. The chance exists to develop a new direction in architecture that is based upon the concept of the quality that exists in difference.

When you think creatively the brain has to be in 'flow', a condition of synchronisation between the left and the right lobes, where both the logical right side and the associative left combine structured thought with associative potential, resulting in a condition where creativity is nourished and thrives. It takes approx. 15 minutes for the brain to reach this level of responsiveness and just a couple of seconds for it to be thrown out again. Flow in this respect can happen both within an individual and group condition. A group condition is often referred to as synergy. It is worth noting that we are only able to reach (either individually or communally) this condition for a period of 2-3 hours in the

course of a day. And that people who work closely together will automatically synchronise their flow period. Interesting isn't it?

The filter function doesn't necessarily require a building. When sitting around the fire in the dark of the woods, the room experience is created by a single source of light. All darkness is that which lays beyond. Such a trick is often employed within the theatre where the seen and unseen are achieved through the treatment of light and darkness. You can create private rooms without building by being in some place at an odd hour or walking in the woods. Some cultures, the Japanese for example, are adept at taking the filter function within the person itself, in turn conditioning behaviour in a cultural context, whilst other cultures send so many signals that there is a need for an external filter in between people as seen in the North American.

The need for the filter function grows the more information has to be processed and the closer you are to other people. It is the wonder of the human brain that we don't have a red button flashing on and off with 'information overload' written across it but sometimes we are indeed flooded with information.

4 The interface

Architecture can be interactive, it can tell stories and it can function as an interface creating contact between people.

We can often be shy or slow in coming into contact with others. This is a barrier to the potential for interaction that can be broken. If there is something exciting to see, people move automatically slower and thus a greater chance of contact is created. Places which promise experience through the language of sign, ware, facade, building and architecture attracts people. Cafés, banks, chairs, merchandise etc. causes people to sit and interact. The possibility for contact is increased through creating:

- Open spaces alongside a pavement to stop and talk having met someone
- Places where people can sit with their back protected, raised a little above the pavement in order that eye contact with passers by is maintained whilst in a sitting position.

We can zoom in on the interface between people through an examination of situations where people thrive as testified to by their body language. People thrive when they:

- Look happy
- Have a body language that is as light and pliable as a soft rubber ball
- Radiate an engaged concentration
- Relax in security

Such situations can be play, sport, dance, discussions, co-operation, flirtation and is something almost physical in its nature.

A clear consequence of a focus upon the user and a consideration of the building as filter/interface is that the office fx is a place with a function. The information office becomes merely one out of a network of contact points. A kind of network server. A scientific location, "a virtual room where the network is alive, communicates and creates potential and new knowledge". You simply choose the filter/interface configuration that suites your particular requirements. This is not the old discussion about a cell or landscape office. This is something about the interaction of people with each other and their environment. You choose the setup you want, a difference that makes a difference. One of the preconditions is an IT mobility that frees work from place. It is possible to imagine a place with permanent virtual windows to your colleagues on the virtual network. You need a quick

response to an idea and walk over to the window looking over your colleague and conduct a conversation. Only you are in the London office and he is in the New York office.

5 Multimedia art

Art is the sublime transaction from subconscious to subconscious of a difference that makes a difference. It can be perceived as something that was unexplainable in a mechanical sense to an almost sublime variation of the filter/interface functionality. Information has also a possibility to integrate metaphor, symbol and language in a completely new way compared to a building/physical understanding of architecture. Art is thus a precursor to a possible development.

As in other works of art, buildings communicate through a direct appeal to the subconscious. When the architect has performed well in his creation of form and material, our experience can be intense and surprising. The best stories are often told through the subconscious of the architect relying upon a sense of the instinctive and intuition. Many architects consider spatial design as a part of architecture and the boundaries are often crossed in-between. But spatial design is as static as sculpture. Just as art has conquered new ground through the inclusion of electronic media as a means of expression, so too has architecture new horizons in its grasp. If it is to support our processes in an information age then it has to become dynamic. From the passive to the interactive. A change from photographic to interactive multimedia. Life is dynamic, and when the vision is about the growth of knowledge, the life of people, then architecture becomes a kind of artistic frame for life itself. A building should have as its heart the interaction between the user and itself. One cannot exist without the other, they exist as a yin and yang duality.

Architectonic artistic quality is measured as experience through the senses. Things can be psychologically hot and cold. Nice to the touch, pleasant to behold. Safe and secure. The senses of a difference that make a difference. The ideal is a balance between calm harmony and a kind of dynamic disharmony. Both the safe, familiar and the challenging. The art is in using the architectural tools to create and reinforce experience between space, material, nature, light, the city and not least the subject:us. A building is to be experienced again and again. We quickly tire of the fashionable and the mannered. A 'cult' film is more of a role model than an advertisement trailer.

Architecture can be dynamic. Living. Something that is constantly changing. Something that changes according to the needs of the user. Something that can open and close, change between filter and interface. The mechanical notion from our industrial heritage is replaced by an organised consciousness born out of the information age. The users make the building become something organic, changing over time and changing itself according to purpose, and at the same time it becomes a theatre to the dramas of life. Life is important not style.

I believe that the interior of a building only really becomes interesting when the audience become the actors. When you yourself decide what it you want to do, how it should be done and what kind of interface is necessary to set the scene. To tell stories and show inspirational images are one way of taking out of the information age something we can use in our play. It could be a way of telling others about who you are, what you do, and become an invitation for teamwork. It could also be a real inspiration for creating new working relationships and a way for them to react to you and lead them to a dynamic exchange of ideas and methods because you are the catalyst for something new. All the levels of an organisation from the individual to the corporate can be visualised working in this fashion. The organisation can, fx visualise strategies and appropriate

actions, maybe even through the use of images and sounds that reinforce conceptual development.

Our working culture is characterised by the workings of both internal and external market forces. In a knowledge society the motivation to take an active part in those market forces becomes essential. Work is a bazaar and ought to be considered as such in its appearance and workings. A place where you can 'shop' between individuals and departments/specialities. If we develop an architecture that can provide a framework for such activities to prosper within this pluralism, ornament and decoration could play their part in setting an appropriate stage for action and interaction. When the steel doors open in the bazaar of Jerusalem and the proprietors hang up their wares for display to the passer-by, the stage is set for objects and subjects to mix in an intoxicating whirl that continues and changes irrespective of the individual transactions of which it is composed. Some shops have a siesta whilst others continue the ply of their trade by spreading themselves across their neighbour. The overall picture is incredibly alive and dynamic even though the buildings themselves can appear shabby and worn. The result is dynamic and exciting, a kind of order out of chaos that contributes to the business at hand. Something beautiful out of something ugly. This is especially interesting when we consider that architects often live in fear of the user ruining the beauty of his creation. It could just as well be the opposite if a feel for the senses is forthcoming.

6 Sustainability

Architecture is a filter/interface between people and natural resources. An extra skin to our clothing. Something that receives both solar energy and screens us from the worst deprivations of the climate. Something that could provide comfort without wasting resources.

We need to develop skills and ways to create synergy in the creation of our buildings so that we can create filters/interfaces that co-operate with nature without harming the environment. Something that is concurrent to the process of creation.

The building is a means, a tool and not an object. The aim is, that we create a comfortable environment for human participation and interaction. The measuring stick is neither Celsius and Lux nor square metres. It is something quite different from wanting a constant internal temperature of 22 °C, partly because comfort is something dependant upon person, clothing and activity and partly because there is a possibility for conserving heat through its localisation in places where it is required. Here, the consideration of dynamic heat radiation instead of space heating illuminates a potential for this to be made a reality.

We have here at the Danish Technology Institute developed new super insulating materials and components that are transparent (interface) and which filters excessive sunlight and converts it to electrical energy. We develop thin, high insulating membranes and minimum constructions. We develop building automation based on self organising biological thinking. Materials that change form and property are becoming available that create new opportunities for filter/interfaces with nature and the eco-system.

Dynamic space for spontaneous human development is a precondition for keeping an architectural framework where functional change outpaces the design life of the physical.

Ecology as a design consideration is essential for a systematic architectural framework for the design of the global building of tomorrow. This isn't just about heat loss and the effect upon the environment, but also a consideration of activity, office equipment, lighting, everything to be

considered from a total energy perspective, even the effects of increasing production is to be taken into account. A more expensive building could have an increased negative effect upon the environment, even though its energy consumption may well represent an improvement over standard practice. Such considerations are very complex and almost impossible to make sense of without thinking in terms of systems. Systems thinking in support of constructivity (construction + activity) is essential for the filter/interface theory to become a reality.

7 Knowledge growth

Through the consideration of a building and the office as a filter/interface it is possible to integrate the learning process into the architectural product. Knowledge is developed in a spiral form around a problem-theory-practice loop through time, ever growing towards the sublime. Each part of such a process becomes indispensable. Practice is the prerequisite for new problems to be recognised and for the process to develop.

Here we need to consider the use of prototype testing and simulation as a part of a creative process. It would be advantageous for such a simulation of reality to stimulate as many of the senses as possible, including touch. However, the most important consideration of all is for the free access by all to test and influence the decision making process in the least preventative way. To experiment and become as used to new ideas and tools, as one is to trying out an idea by writing it down on a piece of paper.

The industrial society's model for working and learning is mechanical. Wheels turning, round they go. Today you sit behind your computer and write until your hand tells you to stop. In a knowledge society it is the creation of knowledge that is valuable. It is creative and not at all based upon regular routine. You take a lead in its development because it is you that is both object and subject. The change of speed between work and rest is increased as they become more frequent in creative work. Then your process grinds to a halt. You need help from your colleges, to draw on their knowledge in the hope that it will contribute towards your own. Your colleagues, coaches and leaders are the key to your success. Soon you can restart the process having come one step further. This is the knowledge society.

8 Building = information x material

Even the physical building process is redefined when considered within the filter/interface theoretical context. A building becomes information times material. Information comes from the process of design itself. In the production phase the material is transformed into the building. Information tells how. The building process has now become a 'black box' between the digital model and the user. Input becomes a reduction of the gap between the virtual and the physical. The design process is the human part, the creative, sensual part of the process. When complete, one has merely to press 'enter' and the digital model is automatically sent, payment demanded and confirmed within the blink of an eye. Your dream has been translated into a living reality you can soon enter and engage.

The building process will become totally automatic. Modules will be produced through robot technology as we see in the car industry, only more agile. Cutting as we know from the textile industry, and printed from the three-dimensional printer as we know from rapid prototyping. Virtual, agile manufacturing has come of age.

The important difference between buildings and other automatically produced industrial products is the difficulty of transporting them to the particular place they belong to. Our vision is the automatic and efficient production of buildings partly through the manufacture of standard performance components and partly through non-standardised materials that expand and stiffen to form the wished-for shape. With a continuous rather than discontinuous shape virtually all of those precious details between the junctions of the building disappear. As easy as children putting up a tent, only you get to decide what it looks like. An ecological house should also be able to expand and contract. Be added to and have taken away. Even be transported from one place to the next. And be taken apart and reused.

I believe that our cultures focus upon linear design is based upon linear thinking. Whilst carrying out a paradigm-shift from the linear to the cyclical, from the mechanical to the systematic, from a building as a physical thing within which we sit to a building as a filter/interface within which we communicate, the cubic will suddenly seem all so old fashioned. Just as when a car become something other than a horse carriage with a small petrol engine mounted on the front, so too can architecture become suddenly something other than that we have always taken it to be. It is no longer necessary to build in x and y directions because that was the way the engineer and architect of yesteryear had drawn them. It was easier to design when one could use a T-square and angle to do the work. Even though we have the tools to do otherwise, we still continue familiar practice. This is linearity in thought. Gehry's contribution to architecture is in taking a lead in showing a paradigm shift. Like it or love it, he has shown it is possible to use human creativity and the computer as concurrent means unto an end. Try visiting the Guggenheim museum of modern art in Bilbao and deny that your senses aren't stimulated.

LEGO has patented its own interface. A precise geometrical relationship has suddenly become a by-word for child creativity. This geometrical relationship is the means of joining one brick to another. Interface in the building industry is also the key to utilising new technology that contributes to a dynamic and creative existence. If we could follow the lead of LEGO, we could build without the need for special training or tools, because the necessary knowledge has already been designed into the product. We have merely to use our creativity. LEGO have their own CAD system, where children (and adults for that matter) can design in virtual space, in a way that we only dream of in the building industry. Children can build in cyberspace, whilst few architects have mastered drawing on the computer in two dimensions, and even fewer builders wish to even consider doing other than their work manual describes. Progress is to be welcomed, not treated with pessimism.

9 Man as biological creature

Information expands, increases to encompass the entirety of human existence. This includes our biological existence too. We need sunshine to create vitamins and relieve the depression of winter (SAD). And we have a need for safety and comfort. Here too, the interface/filter theory can be considered in terms of something physical with an informational condition.

The interface between the building and man as a biological creature is usually described within the context of sick building syndrome. The other side of the coin is regarding this relationship in a positive sense. Health, healing and holism.

Ecology is all about the relationship between the organism and its environment. Our relationship with our environment, each other and things. This leads us to a new architectural concept with the garden as a focus, for spatial experience, user influence and flexibility as well as a metaphor for

fruitful sustainable growth. The starting point is an examination of our social and biological requirements. Only through an understanding of ourselves as human beings and our biological needs can we understand how to live in symbiosis with our environment.

Man developed from ape to prehistoric man in approx. 10 million years. The development from prehistoric man to modern man took a mere 200,000 years. Up until 100 years ago, the majority of people lived outdoors for most of their working time. It will take an additional 200,000 years before we will notice any significant difference in our evolutionary development, It is therefore biologically necessary to reproduce those natural qualities the human body was designed for in the first place. We are not designed to sit for hours in front of a computer. We need to move, change position, talk, relax, switch off, switch on. Outdoor qualities such as daylight, birdsong, the sound of a water fountain, aroma, fresh air – as in the garden – but within our micro-system within the macro-system. Within a place that protects us from a downpour, the harsh wind of winter, the noise of a storm, the bite of an insect.

The hypothesis is, that we as a biological creature have an instinctive subconscious need that has been refined over a period of millions of years, we are not aware of it in a direct sense, but it is there never-the-less. To live in harmony we need to feel that which our subconscious is telling us we should have. It sits as a ROM (read once memory) in the *amygdala* of the brain, the place where we decide whether something is good or bad. A reflexive condition that activates our instinct for flight, battle and defence, before our conscious is ever aware of a sensory perception that requires us to act in a rapid fashion. If we can in any way tap such a potential then we have in the palm of our hand the key to positive human perception. Likewise, our genes are also a kind of biological memory. If we do something that is biologically positive, then the outcome is a healthier existence. Both physical and psychological health is connected to an historical memory that has accompanied us for thousands of generations. It is quite an overwhelming perspective. The Japanese recognise them and absorb them into their culture. Such qualities can be beautiful and poetic and among them we can mention:

- Protection from danger within our surroundings
- Flowers and fruit as a signal for food and scent
- Falling water, spring water and warm water
- Daylight
- View and sunset
- Fire/hearth
- Birdsong
- Earth, gravel, stone
- Air, breeze, wind

It is when we take all of the ingredients together that have a powerful means of expression. They are something that has been our constant companion throughout the last 200,000 years and they ought to be a part of our continued existence.

People return to their ancestral occupations when they are free. Fishing, gardening, walking, hunting, baking bread, sitting around a fire, sitting in company, standing alone with a back to a wall. On the surface of little virtue until we consider the importance of psychological well being as being a large part of our physical health. Such considerations are generally ignored apart from those of an artistic or theatrical persuasion. In an effort to battle through a stressed existence, a lot of us are forgetting what the meaning of life is all about.

We all know that light is important in order to see, and architects, painters, photographers, theatrical directors and film crew are often aware of light as being a medium to mould. Even though

we are not as dependent on light as plants for example, our biology and psyche is never-the-less affected by light. One of the effects is that our biological defensive system is strengthened through the presence of an abundance of light, we become less sleepy, more alive and our misuse of the body through narcotics, alcohol and tobacco decreases. This is as much through psychological well being as physical health. Researchers the world over are proving that there exists a very real connection between daylight and wellbeing, as fx the hormone levels in the blood in relation to sight. The blind do not possess the same symptoms. Research also shows that a daylighting level of between 2000-3000 Lux is sufficient to avoid SAD, but anything above 3000 Lux can be perceived to be too high. In this respect material technologies that filter direct sunlight and admit daylight are to be considered as a part of the filter/interface theory. It is the same light preferred by artists in their atelier.

10 Compatibility with the information age

Rather than become stranded in some historic backyard where our perception is conditioned through material discoveries some 1000 years old, architecture has the possibility of responding to the changes taking place in our knowledge society.