building new transaction spaces

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The Idiot Savant. Struck by an article in the Scientific American about “Idiot Savants” I suddenly realized that the idiot savant is exactly what the computer is to us · An idiot savant is a person who is mentally retarded but has remarkable capabilities in a specific but limited field of knowledge · Some of these narrow-band geniuses can for example remember every single telephone number of a complete telephone book · Some of them can reproduce the complete contents of a Shakespeare novel, but without any understanding of what it is about · They appear to have direct access to their project database in their brains · Without the filters of insight which intelligent people are so proud of having · I was very excited to read this essay, because it has enormous implications for the understanding of our brain, and for the understanding of how we work with computers ·

Direct Access To The Project Database. Direct access seems equivalent to the “list” function in programmes like Autocad · It is an open tunnel to a table containing all registered data · In human brains these data come in through eyes, ears, nose · Everything seems to be recorded, but normally we can remember only a fraction of it · This is because we filter these data in order to be able handle socially · It would be very inconvenient if we could literally reproduce everything, which was stored in our brains · Reproducing the data would take a lot of time (“you only live twice”) and we would not have time left to interact socially, we would not be able to form a society · Have you ever seen those piles of paper, which the computer produces when listing a complex calculation? · You do not want to read this, you may have a look at it, maybe only to spot obvious inconsistencies, but not for actual reading or understanding · Having direct access to the project database is blocked for social reasons · The shells around the database form the interface between database and environment · So is the case with computers · The operating systems, the computerprogrammes form shells around the project data, to make it possible for us humans to communicate with these data · To make it possible for us to give meaning to the data, to make interpretations, to propose changes, to produce new data and to have them sent back to the database · These shells represent our social transaction space ·

Dreaming And Intuition. Am I only dreaming? · In our dreams we have direct access to our personal image-banks · Just like seeing is an action in realtime, also dreaming is an activity constructing storylines based on a vast database of images, relations, proportions, contours, colours, smells, texts, and other possible disguises of information · And it is my guess that deep down there is a generic storage medium running, storing all information – images, texts and relations alike – as raw data in a dynamic project database · In earlier days, briefing the participants in the workshops “Artificial Intuition” in Galerie Aedes and at the Delft University of Technology, Ilona Lénárd and I used to say: “We must train our intuition to operate our logic” · Now we understand that we were talking about direct access to our project databases, unfiltered, spontaneous, direct, actual · We wanted to establish a hotline between intuition and logic, like idiot savants · We know now and we knew then that our personal computers play a crucial role in this procedure · We found out ways to connect our intuition to the calculation speed of the computer ·

Split Second. Training the intuition is topsport · A Formula 1 driver, a top tennis player, a soccer topscorer, they make decisions in split seconds · These decisions are way faster thank thinking · What happens here in the brain? · They must have these kind of hotlines also, these shortcuts between their motoric system and their Formula 1 database, tennis database, soccer database · Deep down in their brains all possible situations and actions are etched, and in a split second they choose for the right action · Faster than lightning, more precise than extensive calculations, very direct and absolute accurate · Being heavily involved in the actual design process, the top designer makes these split second decisions as well · Good design is topsport · And we believe that this sensitivity can be trained · Intuition can be trained · Which is an emancipatory liberation process · One should allow one selves to have access to the project database that directly ·

PC Computation Power. From Ray Kurzweil we learned that by the year 2050 one single Personal Computer may have the computing power of the total human population of the earth · Just imagine! How will we humans relate to these small but extremely powerful machines? · How will we work with these super idiot savants? · This is in my opinion the central issue, which our society is facing the coming decades · We do believe that a well-trained intuition is necessary for a successful communicative relation between (wo)men and machine · It is obvious to us that it is useless trying to compete with the calculation speed of the computer · We should see them as friendly open extensions to our brains (exo-brains), where we can have access to in the way we want it and when we desire so · Sometimes ultra fast, sometimes very slow and filtered · Sometimes immediate like lightning and sometimes as blurry and fuzzy as can be ·

Project Database. So we have numerous project databases deep inside our head · And we want to be free to swap from the idiot to the savant in the way we connect to these data · There are project databases in each computer, where the user wants to be free to connect to or to close off from · The wiring inside our heads and the information flow inside the computer are separate different layers within the same project database influencing one another · Each design project forms its database both inside our own heads and inside our computers · The project must be stored as a 3d model where we can have different views upon · One view is the stereometric view (perspective), the other view is the flat cut (section, plan), the third view the numbers · Other possible views are the physical tactile model, the smell, the sound · Each view is another look at the same thing · The numbers represent exactly the same thing as the 3d model · Only the shell around the data is built different as to generate a specific view on the data · One can change the

data through all the different views · If one changes the 3d model, the data change · If one changes the data, the 3d model changes · If one changes the plan, changes are seen in the 3d model and thus in the data · This concept is crucial for all the work our office is dealing with the last ten years, this concept is crucial for all our proposals dealing with parametric design, artificial intuition, real time behaviour, active structures, multi-player games and transaction spaces · All our work is based on the notion that it is data-driven ·

Data-driven Process. Information technology gave us the platform to communicate with other disciplines · Working together in a data-driven process of collaborative design and collaborative engineering the stakeholders behave like birds in a swarm · They are like free particles, dynamically socializing in the Hive, exchanging information in the flow, developing a hive mind · They are the Swarm · All members of the Swarm are data-carriers in disguise · Every member is a node in the information flow network, in their own disguise, playing their specific role · But in the end it all comes down to exchanging data · The players are distributed beings, absorbing, processing and distributing data · All these data processing vehicles (yes, also people are vehicles, and as we will see later, buildings are vehicles too) operate in swarms, and all these swarms exchange information with other swarms · There are swarms on all social and physical levels and on all time-scales ·

Communication. People communicate · When they talk they produce output in the form of spoken language · When they move they produce output that will influence other people's movements · When they write things down they store the output in a buffer which may be activated later · People communicate with other people, with animals, but can people communicate with buildings? · What sort of language must they speak to achieve that? · And do different elements of the same building body communicate? · And what sort of language will they use to establish the communication? · Suppose that communication nothing more and nothing less than pure information flow · When people communicate with people the information flows from brain to mouth through air to ear to brain · When building elements communicate the information may flow through wires, or maybe even wireless through the ether · The sender sends the signals, the receiver absorbs the signals · Our building bodies are wired · Our cities are wired · Wires being any infrastructure, bringing fresh data in, and carrying concerted data out · Very much like the blood vessels and the lymphatic system of animal bodies · With interactive architecture we want to establish a two-way communication between the people (the users) and their environment (the house, the office) ·

Senders And Receivers. Some swarms move very slowly like geological processes, others configure themselves with the speed of light · Swarm architecture is based on the idea that all building elements are each one of them data-carriers as well, and that they all are members of a swarm · Swarm behaviour has been drastically evolved since the immersion of digital life into our daily lives and into the very fabric of building materials · Building components are now potential senders and receivers of information, exchanging data, processing incoming data, and proposing new configurations as the outcome of the process · People communicate · Buildings communicate · People communicate with people · People communicate with buildings · Buildings communicate with buildings ·

The Swarm. In the Swarm the designers exchange information with their clients, and with the other stakeholders in the process of building dreams · They exchange information with other disciplines in the collaborative design process, they work together with visual artists, composers, graphic designers, planners, publishers, broadcasters of information, and with other architects · They exchange information with construction engineers, installation engineers, project managers and process managers · And they want to establish feedback loops, because they want to learn from each other · They feed upon data from the other parties ·

The Hive. To facilitate the process of collaborative engineering we need to build rooms for group design and decision · We could call them the Hives · One such a Hive will be the second life of the pavilion the Web of North-Holland · Now a not so very interactive propaganda machine for the Province of North-Holland, but after the closure of the Floriade a professional fieldlab at the Delft University of Technology where students plug into the Hive mind with their laptops · The Web of North-Holland will then become a true transaction space · The students and the research staff of my Hyperbody Research Group wants to use the space as a Group Design Room · The Building Management group would be able to use the space as a Group Decision Room · Within this Hive multi-actor and multi-player networks will be established · Collaboration and transactions in the Hive can only take place when there is a smooth two-way interaction between the stakeholders, when all parties involved are active, and when all parties are willing to offer the best of their knowledge and intuition · Transactions are done by submitting data to the project database, in any conceivable disguise, through any interface · We could experiment with sensors, keyboards, numpads on mobile phones, GPS systems, speech recognition, mouse, joysticks, bitmap-tracking as negotiating components · We will absolutely not work with gloves and headsets because this we deem this too restrictive for the freedom to move within the interaction space ·

Hyperbodies. The stakeholders exchange information with the producers of building components, with the producers of digital techniques · They exchange information with their computers, they work together with their digital instruments to build new possible realities · They are the players in the input > processing > output game · Each one of the players operates in their own personal distributed swarm, and all swarms are connected · Swarm architecture is naturally based upon parametric modeling and on parametric behavioral patterns · Swarm architecture is based on the communication between and within the Hyperbodies · First we need architectural vehicles to carry the data, we need synthetic

bodies · Architectural bodies are like the unibodies of automotive vehicles · Architectural vehicles are e-motive vectorial bodies · The Hyperbodies are hyperlinked integrities, which are built and sustained to process and evolve their parametric formulas · The parameters are submitted to and extracted from dynamic databases in real-time ·

Transaction Spaces. Swarm architecture is a true transarchitecture since it builds new transaction spaces · Swarm architecture is at the same time emotive, transactive, interactive and collaborative · Swarm architecture feeds on data derived from social transactions, swarm architecture is the hive mind of the new transformation economy · Swarm architecture is design, construct and operate in real-time · Architecture becomes the discipline of building transactions · That is what architects do: they build transaction spaces · Architects are step by step becoming conscious of the fact that they are the designers of vehicles, which execute of a game of life and death · Architecture has no longer as a hidden agenda to resist to external and internal forces · Architecture now becomes the science of dynamic structures and environments running in real-time · Architecture goes wild · In the meantime the other stakeholders in the collaborative design process are experiencing the coming-out of Swarm Architecture · Swarm Architecture manifests itself as the inevitable evolution of architecture and the building industry ·

Parametric Design. Building and Architecture has from now on two aspects to it: at the one hand one creates a physical environment, at the other hand one designs the behaviour, the rules of the game, the states of mind of the buildings and the environments, directly connected to the physical places · We like to label this as enhanced reality · The design work in both reality and enhanced reality heavily relies on the parametric basis · If not built parametrically one can not play with the parameters, and one is not able to interfere with it, to communicate with the 3d model and the project database, neither in the design process nor in the life-cycle of the environment · Working with parametric models creates the communication space for the stakeholders in the building process to discuss the qualities of the proposed environments · It opens up the design process for collaborative engineering · It also opens up the design process for a possible and meaningful interaction with the clients and the users ·

File To Factory. Parametric design is absolute compulsatory for the file to factory process of making the architectural bodies · One must directly connect the 3d model of the design to the production techniques in the factory · The connection relies on a common language, which is spoken by both the machines of the designer and of the producer · Also here we need direct shortcuts, unfiltered · For the production process of the TT Monument we made a Nurbs surface 3d model and send it as an IGES file to the milling machine of the modelmaker · For the production Web of North-Holland we wrote an exact procedure how to take the separate elements from our 3d model and prepare them for the production with the cutting machines for the steel · We wrote in our office an Autolisp routine which describes step by step the exact procedure · One parametric detail fits all · One building, one detail · One work of art, one detail · But always parametric · Each element is unique, but each element undergoes the same procedure · We are fully immersed now in the industrial production process of mass-customization ·

The Game. To facilitate the concept of collaborative engineering we must build a game, which is a form of open architecture in real-time · We think it is extremely important that the designers not only talk about the process of collaborative engineering, but that they actually must make it work · First then they see and feel how beautifully complex it is, and how precise they must act and think · They must think as programmers, writing code · The designers must deal with the simultaneous development of the design and the communication · The software, which we use for this purpose is based on a graphic interface, it is pure visual programming · Working with the Virtools software includes the design of the architectural environment and the structure of the communication process ·

Rules Of The Game. The whole process of interaction, communication and collaborative design is a parametric game · The designers design the rules of the game, and at the end of the project, they play the game · They design the design · Playing the parametric game of architecture is experienced by the players as a form of serious fun · The design is the formula, the playing of the game means setting the parameters · The players start to realize that if you connect the 3d model of the architectural design to the databases (tables, arrays) the essence of the architecture is not one arbitrary choice of how the environment should look, but actually a multitude of possible architectural schemes, which all are just as valid and beautiful as the other ones ·

Direct Democracy. In the end the concept of interactive gaming technology for collaborative engineering is a strong tool for direct democracy · Now we directly connect to the people we work for and we work with · Not only experts are participators in the process of direct democracy, but especially also our clients, the citizens, friends, accidental users, passers-by · Everyone becomes a player in the transaction space, either consciously as a participator in the designprocess, or unconsciously as a passenger whose presence matters for the real-time behaviour of the transaction space ·