The Matter Group

The Creator Unit

Project C – MDE

http://www.bazaarmodel.net

The Matter Group – *The Creator Unit*

The Matter Group focuses on building the Creator Unit. The Creator Unit will probably consists of the following parts; The Hypercomputer, Atom Lasers, Cyc(s) and Mathematica.

The Hypercomputer

The Hypercomputer [1] internals are Field Programmable Gate Arrays (FPGA) intertwined with Viva software. This forms a blended hard- and software device for utilizing huge amounts of calculating power. These systems are completely reconfigurable (more than 1000 times per second) and are able to recover from faults (instead of fault tolerance). I expect [2] that the calculating power in 2007 will be sufficient for running the rules and controlling the Atom Lasers in parallel within a simulation.

Strong:

- Low power consumption compared with the supercomputers of today.
- The system is able to sustain heavy damage while maintaining normal operation.
- Very flexible; the software (Viva) and hardware (FPGA) are one (programming means that an agent programs the hardware directly).
- These are first generation Hypercomputers, the technical limit of these machines are a few (three?) decades away, which than the quantum computers will be available.
- The programming is more graphic orientated.

Possible drawback:

- Not very familiar within the academics and industry.
- Requires a different approach of programming than which is thought today.

Atom Lasers

The rudimentary atom laser [3] was developed at MIT in 1997. This part or module, within the Creator Unit, is probably the most changeling one. Today's Atom Lasers are to big and the speed of miniaturization of the Atom Laser should be faster than the transistor chips rate (Moore's Law).

Strong:

- The first tool to manipulate matter waves.
- The start of truly manipulating the atom (nanotechnology).

Possible drawback:

- Is still very primitive.
- To big to implement within the Creator Unit. The Atom Lasers needs to be much smaller.
- Unknown within the academic world and industry.
- Truly useful Atom Lasers in about twenty years.
- Under funded; for a more rapid progression in this field an increase of funds are needed. It could speeds up the research dramatically and would give a huge boost for the nano technology field as a whole.
- Gravity. We could build (the Creator Units) and use these devices in space to escape Earth's gravity but at this time it would cost too much. Besides the goal is to have a working Creator Unit on Earth than in space. Gravity has been 'neutralized' in the pharmaceutical industry with heavy magnets, but that is too crude.

Cyc

For most of the people Cyc [4] will be the main interface to use the Creator Unit. Billions of people are illiterate so voice input is the only option for them. Cyc could be used for example in 'creating' an object (just ask what you want) or developing a new on. Developing new kinds of materials via a 3D interface [5] for projection of molecule chains or, when it is organic, matter proteins designing is also possible. The only limit is ones imagination, which Cyc lacks.

Strong:

- It is a mature product with a decent pace of development.
- Very flexible.
- “Understands” the human environment like gravity, water falls 'down', etc. So a cup without a bottom should be out of the question.
- There is a free down loadable Open Source version of Cyc.

Possible drawback:

- Not familiar within the academic and industrial world.
- The coming twenty years are crucial of the development of Cyc's view of reality. Help is needed [6].
- It is a direct competitor with a human being. The only difference is that a human being has imagination.

The Principle of Computational Equivalence

Stephen Wolfram summarization of his Principle of Computational Equivalence: *that whenever one sees behavior that is not obviously simple–in essentially any system–it can be thought of as corresponding to a computation of equivalent sophistication*. The Principle of Computational Equivalence is the intellectual 'tool' for creating any kind of object. A very simple rule or a set of very simple rules will be used to harness the calculating power of the FPGA within the Hypercomputer and the controlling of the matter waves via the Atom Laser. Mathematica [7] will be used, together with for example the voice or other kind of input via but not necessarily limited to Cyc, to create and run these rules.

Strong:

- Extremely powerful. It is applicable in biology, mathematics, artificial intelligence, philosophy, psychology etc.
- Mathematica is able to communicate with Cyc.

Possible drawback:

- It will take some time for the scientific world to absorb the Principle.
- The rules are deceptively simple and thereby camouflages there true power. Many people would think that these simple rules aren't capable of doing anything.
- The rules set is limited (at this time only rule 110 [8] does suffice, but there should be more rules of that kind).

Entanglement – quantum teleportation

Entanglement [9] of atoms is in an early stage of experimentation and in the year 2003 first experimental test at the University of Aarhus (Department of Physics and Astronomy) to entangle atoms were held. Entanglement will be useful for stripping an object apart, atom by atom, thereby recycling it completely. The atoms could be teleported back into a plasma state.

Strong:

- Precise control over the atom.
- Every object is 100% recyclable.

Possible drawback:

- At this stage unknown.

[1] Formerly known as Hyper-Algorithmic-Logic (HAL) http://www.starbridgesystems.com/
[2] "*In sheer density, FPGAs are outpacing Moore's Law"* from **Dynamically Reconfigurable Computing: A Novel Computation Technology with Potential to Improve National Security Capabilities by Dramatically Improving High-End Computing:**
http://www.bazaarmodel.net/Project-C-MDE/DataGroup/Hypercomputer-papers/Dynamically-Reconfigurable-Computing.pdf
[3] http://www.bazaarmodel.net/Onderwerpen/atomlaser/index.html and http://cua.mit.edu/ketterle_group/
[4] http://www.opencyc.org and www.cyc.com
[5] http://www.io2technology.com/
[6] http://murl.microsoft.com/LectureDetails.asp?1032
[7] Mathematica http://www.wolfram.com/products/mathematica/index.html
[8] A New Kind of Science page 675 till 714. The book: http://www.wolframscience.com/nksonline/toc.html
[9] Quantum "Teleportation" http://www.bazaarmodel.net/phorum/read.php?f=1&i=723&t=723#reply_723