Human Orientation (HO) of IT, a new paradigm?

First proposal – worldwide in IT (2010)

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1. Abstract

At beginning of 21th century (= “Age of Information“) Information Sciences and Technology is non-braked growing. Scientific thinking humans recognize some fundamental missing developments, which shall be signed out here in a general way.

Here – connecting and equivalent to OO (Object Orientation) - first time a new paradigm is drawed up: the HO (= Human Orientation or orientation of IT to human properties). Some errors of OO and earlier ways of thinking can be corrected and a more human world of work and life can be created.

An embedding in legacy and confidential scientific networks is desired.

2. Key Words

Interface Human Being - Machine and Human Being - Computer, Natural User Interface (NUI), Human Being as subject
3. Paradigms of IT in retrospect

3.1. Legacy paradigms in IT

The word paradigm (= way of thinking, model or a thought system) appeared in IT at about 1990 in connection with actual valid and mainly used Object-Orientation (OO).

In the years before no unified ways of thinking in direction methods of design and development had been made. The explicit marking in the word „software-crisis“ in the 90th of 20th century was a significant indication of this deficit.

If we go more back in time, till the 40th, as the first full automated computers where created, we come to K. ZUSE (1910-1995). He has created in 1941 the first programmable computer. Before him John von NEUMANN (1903-1957) developed the theoretical concept of a computer. In his postulation of unique storage ability of data and programs he defined the realistic fundamentals of programmability of machines.

This new ability of controlled storage connected with ability of addressing was a main guideline of software and computer design till OO. Stored data where separated practically and functionally in working-data (input-output data) and programs (genuine control-data).

So with some courage – if we look back from now - we can summarize this time as time with a „storage-oriented“ paradigm.

3.2. The paradigm of Object-Orientation

The immense growth of the technical development and acceptance of IT in the 70th of the last century made it necessary to think about systematic structures on this new market.

Scientists started to develop human ways of thinking to overcome the „software crisis“. Out of philosophy the terminus „object“ became even a new element in software-planning and defined the latest style in software-design and – development – the OO.

In connection with the new logical design method around UML (Unified Modeling Language) according to G.Booch, I.Jacobson and J.Rumbaugh the definite finish was reached at about 1990 even by a new software development tool in this style.

Software development became as standard sized discipline of Engineering Sciences.

It’s a fact that the leading interests of information scientists could not take care of more environmental and broad facts around the computer. Now follow ups in the whole human
society have to be researched. There are no borders in genuine technical realizations; the new borders seem to be the human properties only.

4. Why even a new paradigm?

The new way of thinking in paradigms in OO brought this new possibility of thinking between philosophy and software design. A new group of information scientists was built – the theoretical information scientists („infologists“). Many theoretical information scientists are genuine mathematicians but this new group thinks about all involved branches of science and these are a lot.

It’s almost a duty to start new ways of thinking representatively and powerful on this logical level. This level is found now, so why don’t we use it?

The actual question is now: Are there real reasons for a new paradigm or do we search an own new profile only?

My personal meaning is that we need a genuine advantage out of it. So all till now known weak points or even errors in development of software and hardware have to be pointed out and made better. The great goals of this new paradigm have to be:

- take care on human borders,
- take care on different time-measurements on human and computers side
- take care on human psychical and physical needs (long termed)
- keep humans free from stress and pressure
- make humans more able to control the computer - as they need this machine
- don’t allow non human behavior in life and at work

Legacy known areas as humans-machine-interfaces or especially humans-computer-interfaces are known in single points. A very modern keyword of IT in the years 2008, 2009 is „Natural User Interface (NUI)“. The connection human being - as living organism with mind and body - and the every where existing computer has to be researched as the whole. We can’t allow that humans change themselves more than they can do it - biologically and psychically. Borders of humans have to be researched (1).

Software-development in the planning-phase und partial realisation is immaterial and therefore very easy changeable. Nearly no problem of working- or living-world is unsolvable. The variability of soft- and hardware makes nearly always a solution possible. A realization is only a question of will to work, of enough time and enough environmental resources and money.

Where are the borders of IT? Besides of fitting soft- and hardware (which change both very fast) remain the amount of work data and the involved information itself. Data is
separated in input and output data for the computer and in data which has to be transformed in information (the genuine goal).

Information, in my latest scientific meaning, can only be worked through by human beings. Therefore human beings and all other forms of life are at least the last borders of information handling. (1)

So it makes sense for the future of IT to take care on the theme “human being and information” in a deeper way and to develop a paradigm out of this. This work may be worldwide a clear sign in this direction!

5. What should remain?

5.1. Legacy formal IT-systems for simple, equal remaining and much repeating orders

A part of orders to software can be reduced on formal simple solvable structures. That’s efficient if the repeating parts are very often. Input data and result data are simple structured and organized in data files with equal record structures.

Such problems can be solved by sorting and group wise handling. In automatic steps they can proceed efficient. This software gets its quality by being used very often. A kernel element in these software-programs is the repetition (= loop). Equal remaining and always repeating steps of work are fitting best for these orders. The revenue is not only the definite completion of an order, but also the high speed and machinelike certainty.

Such low complex problems can be solved in a legacy formal way. Best usability of this type of software is possible with microprocessors. We summarize these solutions by Ubiquitous Computing (= small computers in all life situations). Examples may be service-automats from various food and drinks till single amounts of needed money.

These simple structured software-solutions are a relict of legacy formal software and are best fitting for the future.

Storage structures are files, records and arrays. The handling can be done by sorting conform to signed out sort-identifiers, in equal staying sequences, in few forks and controlled jumps and last not least in significant loops – all together in the legacy formal style. With these elements simple problems are solvable, we need not yet OO-planning.
6. Which errors shall disappear

6.1. Incompatibility

At the beginning of the OO paradigm (about 1995) it was common that all legacy formal IT-systems should go on and parallel to them new – sharp logical separated – OO-IT-systems should start in a strong separated organization.

It was expected that the legacy formal mainframe computer centers will run down and soon only OO-systems will solve all IT-problems.

This was a logical exact way of thinking, but not acceptable in praxis, because the central mainframe systems in big banks, assurances and common industries didn’t fail in their production. They had no errors and where much better than the new and not yet solid OO systems.

That brought the actual state of parallel existence of both paradigms and IT-systems.

As realist I suppose and propose that a new paradigm has to include both (formal and OO IT) in a new way in a seamless upgradeability.

The new way may be called “HO (Human Orientation)”. It has to be a new paradigm, compatible to both legacy ways of thinking and IT-systems. The new paradigm can act „worldwide unique“. It has to organize a seamless compatible upgrade out of both sources (formal and OO). The economic profit will be great.

That’s hic et nunc a keen postulation only; a way for solution can’t yet be seen but is the goal of my scientific work in the next years.

This actual incompatibility (formal, OO) can be seen as the main error of leading IT-specialists in the last 20 years. New HO-organized IT-systems have to conduct both to one. It will not be possible suddenly, may take about decades, but is necessary.

Incompatibility in general is in my opinion a factum that exists in whole software und hardware. Till now it’s accepted without thinking about this problem. Some big industry-cooperation’s may have short-minded profit, but for long time they lose in survival and quality. Seen out of common economy very much money and effort is lost. Only some firms have an advantage for some years by these fitful incompatible technical revolutions. From side of public organizations we should start to point out this fact. Incompatible hard- and software has to be marked as inferior good of minor value.

Software, as human-mental product has to become more living, naturally and humanlike.
6.2. Performance problems of actual OO software

On the level of real OO IT-systems it’s known that these OO languages have a problem by the great complexity of needed objects. The concept of heritage of classes brings a continuum of classes, but can’t solve the complex variation of needed classes in a satisfying way. The actual solution is the interpretation of the programs line by line. That brings a real actual solution, but is very slow.

Possible new ideas are:

- Object-Orientation brings a human-like logic but does not respect enough the computer-performance. We have to convert our problem step by step to a computer-machine-orientation. The distance between human need and hardware-possibility is till now too great and unstructured.

- Perhaps we should start from two sides: computer-hardware-side and subject-user side and find so a new solution.

- By reviewing the principle of heritage of object–classes we can find perhaps new ways too: If we stay at the object-concept (data and software combined) we have a continuum - but a very much changing one. Very deep - during performance of an object - a next object call can be done. So a very much changing performance-code (line by line) is existing. This costs time.

- Perhaps we can define a “relation between object-classes” at the beginning of a system?

- Perhaps we can mark up these “relations” to an own new constructing element in software design?

- These could we call for instance conjunctions (= possible logical relations) of objects.

All used object-classes get so compile-able before execution of a program.

That all is easy to propose, of course, but the future has to bring a solution.
6.3. User-indifference of legacy IT-systems

Now we solve an IT-problem by skillful combination of hard- and software. Every new IT system till now doesn’t take care on personal properties of the users. A user is till now involved in some special roles and standards only.

User control their work with their eyes and fingertips only, they can be over strengthened in this parts very easy. The usability of a computer should be better adapted to human possibilities, like speaking, hearing and movement - an interface with more inclusion of human muscles. This can be an advantage for longtime work at a computer. Involving of the whole body makes object more easy and faster learnable for a human being (2, p156ff).

Till now we didn’t think about different users as persons like: children, youngsters, grown ups, men, women, experienced or unexperienced, sick or partial sick persons. Till now a “standard user”, healthy and functioning was thought. The different human beings - as they are – where not treated. The importance of IT is to judge us to them.

Till now not yet involved are also living feelings as tiredness, stress, reluctance, aversion, anger, pain, joy or sadness.

Relations under humans as trust, sympathy, understanding, love and erotic relations between man and women are important in normal live but not yet in IT. A machine can never act like a human being, but it can react to his human properties.

Humans should not adapt themselves too much; the techniques in IT are able to adapt themselves to human needs! We have to take care in future, that these postulates are not only written letters.

New appearing diseases (depressions, tumors, schizophrenia and dementia) and wrong development in preventing health care have to be minimized in a broad way for the whole state.

This new paradigm till now is proposed by me only. One single person is not enough. Therefore I try to find same interested scientists to research this interface “humans-computer” in summary and develop an own paradigm and make the results global communicative.

This paradigm which has to be researched can be used to create more humanlike soft- and hardware. It is important in all those cases when humans come in connection to IT.
The main goal till now was the solution of an IT-problem. To find a solution is more and more possible and can be supposed in nearly all cases. The numeric restrictions as defined in Gödel’s Theorem can we overcome by fitting software-algorithms. **Now we can take care on more and more humanlike solutions.**

In order to overview our new paradigm we have to think about:

- What is „humanlike soft- and hardware“?
- How do we have to create soft- and hardware, so that the using persons have an advantage?

A typical realistic result can be the deleting of **distress (stress without solving result)** which can be caused in many cases by impersonally technical equipments. Mental and psychical **over strengthening** of broad social groups creates more and more psychic, even physic diseases.

More and more inhuman techniques (soft- and hardware) cause over strengthening and over strengthened believing in science. Knowledge seams to have more value than believing by a healthy soul and mind. Knowledge is wanted to substitute believing in a higher, healthy and “over-human” power. But knowledge is always specialized und uncompleted. The maintenance of the human soul is in danger to get neglected. Understanding is evaluated higher then „feeling well“ and „satisfied, balanced life“. Intellect is inferior to a believing in a loving and caring overpower (=God, Nothing, Super-Ego). Pure egoistic intellect can’t make individual humans happy.

To all these HO (Human Orientation) has to relate. Human borders in the mind have to be pointed out. The human self-confidence, the human identity and person has to be respected in IT more and more.
7. General goal of HO

One person never can solve such a huge area of actual IT. One person can only find out headlines and main groups as the whole. One person can fix valid new structures and goals for researching.

Now it seems important for me to inform the scientific and later on the whole public world about possible wrong going developments which are sourced by short minded commercial success. This new paradigm has to set general goals of research for all humans and try to make the world looking on them.

This thoughts and ideas exist since years in my head. I try to find a structure and reflection in the human legacy culture and in values that stay nearly timeless.

It’s not important to get a personally profile only. What I do is a service on the humanity in the age of information. The human beings can’t delete themselves for long time, some humans detect possible dangers and inform the rest of the world.

8. First single terms

8.1. Paradigm

The word comes from Old Greek παραδείγμα – παρα besides, δείκνυμι show, make usable. It means originally pattern, prototype, sample or delimitation, prejudice.

Since late 18th century it’s used in cognitive science to describe scientific ways of thinking.

Thomas Samuel KUHN (1922-1996), an American science philosopher, has studied this word exclusively. He described it as a main pattern of thinking in a certain time, a doctrine or a certain common consensus about assumptions and imaginations, which make solutions for a lot of questions possible. He celebrated in 1984 in his „Nymphenburg-Lection“ after about 34 unsuccessful attempts of definition his stop to do more of it.

In behavioral sciences it has a negative meaning like prejudice, a valuing before thinking about something.

In philosophy of sciences it has the meaning of model-visualization to explain phenomena.
In information sciences it's used as focused view of a mainly fundamental aspect of a specialized area. Sometimes in last decades it’s used as an „up-to-date word“ with scientific flair but not deep back ground.

Here it’s used in his original and epistemological sense: a way of thinking, a model for solutions, a schema for development. I personally use it since OO way of thinking because I heard it so for first time.

Before new paradigms always a paradigm-change is happening, hear it’s thought from OO (Object Orientation) to HO (Human Orientation). In this case is special, that this change is made in a seamless continual way.

An explicit mental learning and development is shown, which will not be finished after this.

8.2. General organization and structuring of HO

Till now no general publications are known to me. I see in this theme an exiting and selective chance. Some parts (stress research, biology of a human being, human way of thinking, development of IT, social following of IT) give signs, that this theme should be researched as the whole and will bring great benefits for the whole humanity.

Most important question now:

**How far reaches this paradigm? Where are his borders?**

Perhaps we can define his borders so:

- all technical products in hard- and software which come in contact with the human being,
- all products and artifacts which influence, change or accelerate the human thinking and behavior.
9. The author as father, inventor or nominator of “HO in IT”

Author Franz Plochberger was born in 1948 in Lichtenegg, in the south of Lower Austria. His teacher in Elementary School, an officer and survivor of 2nd World War and war captivity in Siberia, detected his intellectual abilities. He „ordered“ his mother, to give him into a Secondary School.

In rural areas at the end of the 50th of the 20th century this fact was equal to be elected for a study and education to a catholic priest. Just in that time a new built private Secondary School of archdiocese Vienna, named “Sachsenbrunn” was opened. It is situated on the edge oft the „Wechselgebirge“ between Styria and Lower Austria framed by woods and green areas. He started there with the goal to become a catholic priest, but after puberty he realized that he is not able to go this way and one year before finishing he changed the school and visited the last year in Public Secondary School in Baden at Vienna.

Unfortunately he got not so good teachers – a nearly sick teacher for Chemistry destroyed his interest in Chemistry. But a young professor of Mathematics and Physics detected his intelligence and took care on him, so that he could reach the Matura. He was really alone , without personal guidance, but with the ambition to study the very long and difficult „Electro techniques“ at the TU (Technical University) Vienna, because in the 60th of last century that study was most up do date. He wanted to understand, how Radio, TV and Satellites are working.

The educated knowledge was mainly humanistic and philosophical. Therefore he had difficulties at the beginning of his study with the definitive and exact way of thinking of a Bachelor-Orientation. In the second half of his study he had luck by getting a job as scientific auxiliary force at the TU. So he was able to finish his study without financial problems.

His self-confidence and trust in his scientific skills grew at the end of his study, because the knowledge in Mathematics, Physics and Electro techniques got more and more theoretical. He detected his scientific interests but had no private contacts to guiding teachers.

So he finished his study and took a job in industries of Informatics. At that time (1978) this latest technician discipline was very interesting. All interested young academics were welcome in the new specialized Informatics-Industry and got their practical education direct at work. An own special scientific discipline in Informatics at European Universities was just built up.

After about 20 years work at the forefront of practical industrial Informatics he was invited in 1990 to assist as HTBL-Professor in Informatics at the first HTBL in Lower Austria, St.Pölten. Personal differences sourced a turn back into industries.
In the midst of the 90th in last century he started to write down his own ideas and imaginations. He was searching for “remaining values” in Information Science and came more and more to Theoretical Informatics (“Infology”). He tried to think-through the latest trends in a scientific way and to find out goals for the future. Today the contents of his scripts of that time are used standards in circles of information scientists.

His themes were and are till today: data, structures, information, Humans-Computer-Interaction.

His latest script is titled „Borders of Human Beings“ and his great actual goal is the research of a new paradigm – the Human Orientation.

He searches a well-known and leading research team to work together and to open a wider scientific net and teamwork.

If an academic graduation is possible he is glad about but main goal is the research with same interested scientists.
10. Sources of literature
