Human Computer Interaction, Cognitive Cybernetic & Captological Education

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Abstract: This paper was inspired by the topics by Marshal McLuhan about cibernetisation media understanding, associated with new findings in intelligent systems that lead towards technological anthropomorphisation, and Larsen's model of cognitive controller mood. The results of research conducted from 1990 to the present day outlining the issues associated with captology are presented, and their transfer to specific areas in education outlined. The objective of the theory is to comprehend, interpret and describe the appearance of various disciplines in the natural and social sciences relating to cognitive cybernetics and Human Computer Interaction. In accordance with the unique principles, multidisciplinarity is replaced by pluriperspectivity, and an approach to integrating research methods with engineering design. The theory answers questions using cognitive cybernetics and its recognition and transformation of Descartes's saying: "cogito ergo sum", (I think, therefore I am). Work presents the relationship and correlation between man and technology as Human Computer Interaction with technological definitions Intelligent Systems and Captology. Special attention is focused on today's modern education with the use of virtual media and the cultural matrix within which the particular media is active. For intelligent educations systems to become more useful and acceptable, we need to consider the "system" as a synergistic composition of software behaviors, and the human interacting. Human interaction must be dominant and having considered the ruling. This cannot be achieved with today's captological educational media. Captological educational media stifles people, casts their most important, (social), role in education and makes them unhappy. Human Computer Interaction, as a strategy and philosophy, is the future of education!

Keywords: Intelligent; Human; System; Interaction; Captology; Cognitive; Cybernetic; Anthropomorphisation

1. Introduction

The positive and successful development of intelligent systems associated with human intelligence in the early 1980s, including the development of intelligent platforms for the collection, processing and use of information, to be applied in the expansion of industry and the advancement of society through intelligent autonomic robots, with the introduction of humanoids into the social and palliative spheres of life.

In the 1990s, begins serious development of: Intelligent Human Systems, (IHS), Human Intelligent Systems, (HIS) and Human Intelligence Systems, (HIcS) encompassed new steps with connections to intelligent interactive technology for use with algorithms that included the principles of human thought and scientific analysis of social activities and human intelligence, using mathematical modelling, scientific research on the brain, and cognitive sciences in general.

Such intelligent systems are starting to be used in specialized education, and contained knowledge from various fields with sophisticated decision-making processes, and capacities to explain their actions.

An important part of these intelligent systems was their capability for effective interaction with humans in a social

Setting - Human Computer Interaction, (HCI). In HCI, human communications, all IHS is capable of explaining its actions, and that characteristic was sufficient to begin its use in all spheres of life, including in all types of education in all virtually institutions. The introduction of such systems resulted in significant impacts on human resources, which to date have not been systematically analyzed, and there are currently no relevant research studies or documents that would be able to indicate their absolute effectiveness.

This problem has been recognized in 1964 by Marshal McLuhan. He had foreseen thirty years before the Internet and theoretically elaborated in his work "Understanding Media". In this paper, we treat the intelligent interactive technologies and computers as the latest educational medium.

2. Cognitive cybernetics and technological anthropomorphisation

The results presented here indicate that the use of cognitive cybernetics in interdisciplinary research has led to the recognition of the logic of the technical sciences in its complete rule over the whole of space-time in the world, systems and life, and whose expansion begins with:

• Blossoming of the information sciences,
• Unfolding of the theory of the media, and
• Development of communication technology.

Cybernetics, in the sense of an end to philosophy, was outlined by Heidegger at an International conference in Paris, also 1964[1],. From the demands of cybernetics to control all processes in the creation and control of life with the help of feedback, balance and the control of information exchange between the system and the environment, techno science begins with the construction of life from radical transformations of battle in the post-human stage. At that time, Heidegger's message was not fully understood, and half a century would need to pass before it could be explained and recognized.

The most transparent interpretation, used in this paper, was offered by Dr. Žarko Paić in his research published in the books Posthumano stanje (Post-human state), Kraj čovjeka i mogućnost druge povijesti (The end of man and possibilities of another history) and Sfere egzistencije (Spheres of existence)[2]. Dr. Žarko Paić currently the most significant Croatian philosopher, author of an impressive number of works on sociology of culture, media theory, visual communication and semiotics. He viewed the establishment of the rule of a new information code in contemporary society as the creation of a virtual world of artificial minds, and life corroded by a crisis of the ideas of community and truth. From the aesthetic construction of the techno sphere, form rises over matter, and its bioethical call is one for unity of nature and the living machine in the cybernetically comprehended environment.

Adorn's revelation of Kierkegaard's existence through the raising of the issues of modern understanding is recognized, in which freedom takes a special place in its three different modes[3]:

• Will for power,
• Work practice, and
• Existential belief.

## 2.1 Liberation through cognitive cybernetics

Freedom relates to the radical breakaway from the logics of causality, in which freedom and existence arise from something that enables them from the other side of the historically and logically established significance. Freedom and existence surpass the horizon of the battle. As the foundation of such freedom in the disassembled world of objectively established institutions of the civil society and state politics, it is necessary to cognitively define the boundaries beyond which lies technological anthropomorphisation.

An overview and recognition of the issues of technological anthropomorphisation describes the parameters of cognitive cybernetics [4-5]:

- *Cybernetics* - adequate feedback between the receptive capabilities of the senses and the willful action of created emotional personality of habits
- *Cognitive* – a combination of thought about spiritual ideas and images organized through the interactions of the neural network, using images confirmed by sensory reception

Such an approach is necessary in order for thoughts to create ideas that the brain can use to master the illustrative structure contained within through the practical exercise of imagination. Mental management and focused attention are used to remove what is not necessary.

Roger Vittoz claimed that one of the most important forms of control over one's self (self-control) requires control over the senses and actions. It can be observed that control spreads over the entire life, and in that way human want succeeds, i.e. to want good and to learn to live right. The choice of behavior that liberates, expands and nurtures the consciousness and conscience, can be described using process diagrams, in which HCI is a circular process in the existence of the present and the future. Existentiality that moves away from the human being and enters the computer, **Figure 1**[6].
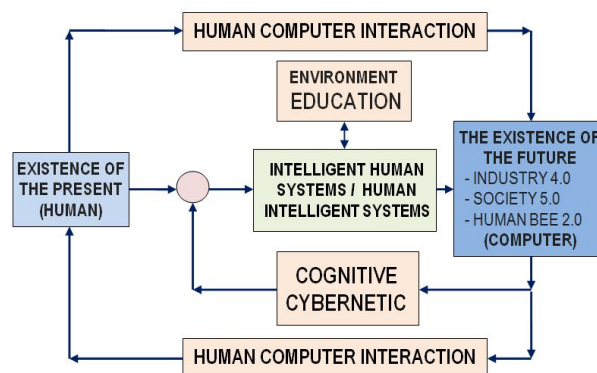
Figure 1; Cognitive Cybernetics in the Dependent Process of Existence with Intelligent Human Systems

2.2 Sensory observance in education

The concern for the effects of computers and other machines on the human body and mind often overshadow the desire to achieve speed, maximum efficacy, precision or simply, the greatest possible gain[7]. Speed, efficiency and precision is the "cuckoo's egg" established by persuasive technologies, also in the area of education.

Computers and all interactive mobile technology, such as Captology in Humans, remove repetitive mental exercise, thereby distancing humans from deep learning. Devices that facilitate work alter the nature of the entire task, including the roles, positions and skills of people. The approach to increasingly distance humans even further from the process, the cycle of procedures, feedbacks and decisions that govern operational aspects of systems is leading towards "automatization that guides technology". The misanthropic objectives of such technology are portrayed as humanistic, which reflects an almost religious belief in technology, and an equally strong distrust towards human beings. In the absence of adequate feedback, according to the proposed theory of cognitive cybernetics, efficiency is impossible, and progress only minimal. Here lies the answer to the need for the use of cognitive cybernetics in education. Ergonomic scientists Robert M. Young and Neville A. Stanton presented evidence that a person's attention capacity is reduced in accordance with reduced mental demands. At very low stimulation levels, a person is so uninvolved and uninspired that success is nullified[8]. Today's discoveries and insights in the field of ergonomics which are transformed into the engineering of human factors is too often overlooked or underestimated, despite evidence that this is technological anthropomorphisation.

Today this image is superimposed on everything, everywhere, including in education. The visualized period has been placed in a symbolic relationship with the space achieved through overwhelming anonymity, without any identity except the virtual. The image is intended to be nominally consumeristic, as it has been transformed into all the

possibly available information and data in order to be relentlessly spent. However, it is important to consider the remaining components that are significant for education, in order to reach a conclusion. These are:

Time, which is "pressed" by the excessive abundance of information, including the overabundance of events, the overabundance of accessibility, and even, as such, an overabundance of individualization. Such time generates a lack of personal time due to the excess of global space lost in virtuality. This results in a "shrinking of the planet" as a lack of space which, due to the consumerist consequences of developed interactive intelligent information technologies, the imperative of mechanical purposefulness is "gaining time".

Space primarily characterized by anonymity, alienating the usual functions within the overall world of symbols. Knowledge changes the function of the soul, body and self-consciousness within the overabundance of space, and contemporary humans are lost wherever they find themselves under such conditions. The habit of being lost is transferred to all other specific spaces, including those intended for education.

Model as an anticipation of each possible reality through the modelling of a closed loop constantly presents the illusion that society is heading towards higher phases of progress. For that reason, everything is permitted, and today, everything may be modelled. Models surpass the transcendence of reality, and as such are no longer even something imaginary in comparison to reality, which is necessary in education[9].

Simulation which indicates the creation and loss of the essence. The master of simulation, in the context of projection through intelligent technology, is no longer human, and is not a holodeck, which is the work of human hands, and therefore the accepted creation, in and of itself, is technological anthropomorphisation.

Simultaneity as absolute time in which virtual life, though without reality, becomes the new reality. Such reality, as predicted by Jean Baudrillard, is finalized as the Simulacrum. This cultural reproduction and shaping of behavior and population attribute using new technological means has already become deeply rooted as something essential[10].

These parameters, recognized and explained in this way, are an enemy to education. In these parameters, there is no relationship between educator and educated, and the user relationship is lost in the space that is conditioned by captology, instead of by life and primal needs. Loss becomes the new standard of modern society, which gathers humans into pressed time with millions of symbols, advertising billboards, different messages and articles of a minimalist format. The seemingly increased standard of education, through consumerist accessibility of information, has resulted in the effect of rejecting deep comprehension.

Intelligent interactive information technology, mass media, advertisements, the Internet, social networks, the eruptive course of information (through countless paths), and their accumulation to the levels of "big data", among which are simultaneous "dark data", are having an increasingly counter-effective function in education. Regardless of the results of research and the increasing public demands in this time of general excess, it will be difficult to convince those giving the orders and those responsible for implementing captology to try to initiate change through cognitive cybernetics, as any opposition is proclaimed to be provincialism or campaignism[11]. A study conducted on captology and the human factors (by Mark Scerbo), showed that informatisation and automatization systems in many professions, and also in education, often increase the burden and create conditions of uncertainty. Instead of reducing disturbances and stress, computerization in most cases forces people, particularly in the education profession, to deal with additional tasks and excessive administrative work that serves no purpose.

If in today's time of complex systems, ergonomists are our present day met physicists, then the revelations and insights in the field of cognitive cybernetics and human factor engineering must clearly state that the computer, as a pervasive technology, is removing the repetitive mental functions in humans which, in the sense of education, results in a distancing of humans from deeper learning[12]. Devices designed to save work are changing the character of the entire task, including the roles, positions and skills. With the captological approach, educators are becoming increasingly detached from the processes, procedure cycles, feedback and decisions in which they should dominate, even though the future of human existence has been depicted as: "Industry 4.0", "Society 5.0" and "Human 2.0".

Due to the increasing attachment of educators and the educated to computers, even in their private lives,

human beings are moving less, and meeting and conversing less with other people. Due to the unlived experience, neither can the lived experience be possible, as it is already lost in the technological anthropomorphisation that is taking on the framework of civilizational captology.

A series of examples have shown that the excess of information and our inclinations to rely on software in educational activities from the earliest age (primary school), makes it increasingly difficult to implement thought material, which would form a useful foundation for future life. It is impossible in this captologically confusing chaos to archive thought material in a careful and balanced manner, as it is chaotically and fictitiously visualized, and it is undetermined. Though it not connected to images but to action, and it is upon this foundation that the task of an adequate comprehension of the world lies, an intellectual comprehension, depending on whether something is actually "done" on that world.

In order for this to be possible, the integration of cognitive cybernetics in future intelligence systems should be enabled on the transformation of Descartes' "Cogito ergo sum" (I think, therefore I am), where the "cogito" from think, is comprehended to be recognized as "I feel, therefore I am",

But, Marshall McLuhan in "Media Understanding" states that "the word, as a "comprehension" or "perception" refers to the process of going to one thing over the other, to elaborate the observations of many aspects of the senses At the same time, it is obvious that "touch" is not the skin, but the interaction of the senses, and "staying in touch" or "touching" is the question of the fruitful connection of the senses - the vision turned into sound, movement, taste, and smell[13].

In this clarification, the word "cogito" as "touching" or "perception" is contained in the essential knowledge of interaction between human and computer.

This understanding connects HCI and IHS and HIS through cognitive sciences. The cybernetic approach and the interdisciplinary structure are dealt with, Study of mind, Study of intelligence and Computer. Four analysis levels describes confirm the facts: Physical - cognitive substance from which the system consists, Cybernetic - how information is processed to produce observable output, Behavioral a direct observable output as well as a backlinks of the cybernetic process and Tactual -interaction as a touch of emotions, **Figure 2**[14].
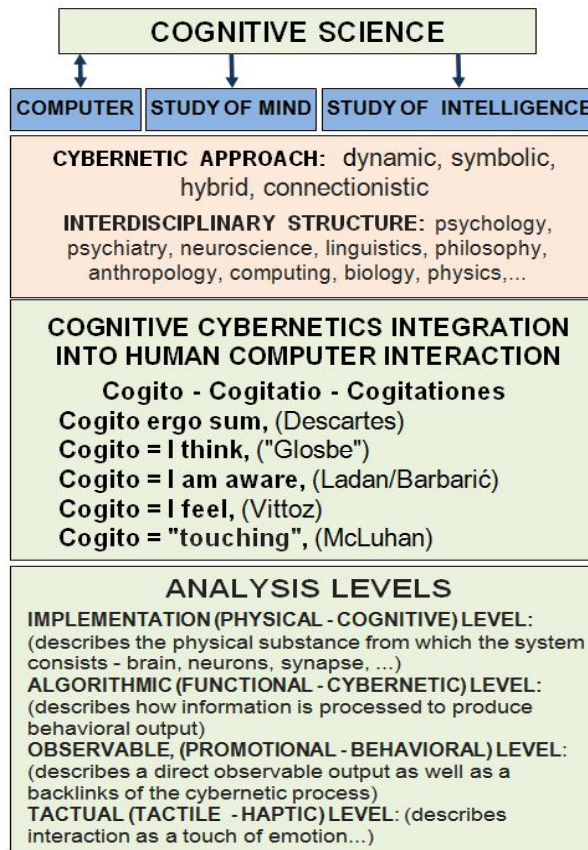
Figure 2; Cognitive Science in the Interpretation and Integration of Cognitive Cybernetics into Human Computer Interaction.

2.3 Captological education

The phenomenological expression of the life of contemporary humans, as beings without a reality/imaginary determination, is a copy which surpasses the original. The long-reaching consequences of captology, should this continue at the current rate in the educational profession, will develop a culture of copying. The outcome of that culture is a break in the relationship between knowing and doing. Thinking, or the acquisition of knowledge, is far from being just a sedentary task, as it is often considered, and which the captological influence is reduced to[15]. New generations of "adaptive intellectual interactive technologies", including IHS, is in fact introducing hypercaptology under the guise of bringing a dose of humanity into the relationship between humans and computers, (Humans Computer Interaction).

The new generation of educational systems is intended to replace judgement, instead of complementing it. Such educational systems act as a prosthesis with which to replace lacking and inconsistent human thought with precise computer algorithms that are not used in education. Such an education is a product of simulacrum of reproduction, with an effect on shaping the behavior and attributes of the population.

The modern educational environment is today a virtual medium. The important parameters for the new approach to media study are: the content, the media, and the cultural matrix within which the particular media is active. The Purpose of any media or technology is: Change the scale, speed, or pattern of human relationships. For these reasons it is necessary to know: "The products of modern science are not in themselves good or bad, their value determines the way they are used", (David Sarnoff).

On these grounds it will not be possible to get answers as paraphrased McLuhan's squares of anthropological technological determinism of the media, **Figure 3.**
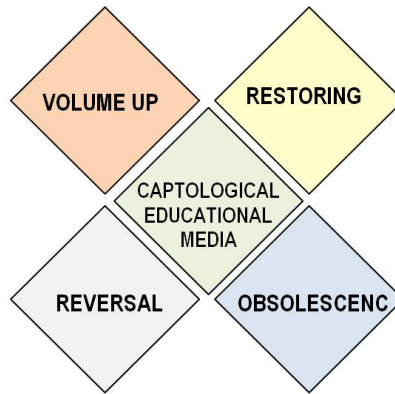
Figure 3; New McLuhan's Squares**.**

Virtual intelligent systems are becoming more and more of a reality educations. But with the exception of very special purpose systems, completely autonomous systems are not yet the norm. In reality, we need to have humans, (people), who control the systems, intervening when needed. As educations systems increase in intelligence, the goal for human-in-the-loop activities should not be to eliminate the human.

It strives to create a partnership with a human system with greater capacities than individual components. We currently view intelligent educations systems and the operators or supervisors of these systems as separate components and conduct evaluations in the same vein. For intelligent educations systems to become more useful and acceptable, we need to consider the "system" as a synergistic composition of software behaviors, and the human interacting. Human interaction must be dominant and having considered the ruling. This cannot be achieved with today's captological educational media. Captological educational media stifles people, casts their most important, (social), role in education and makes them unhappy. It should not be forgotten that the "CAPTOLOGY" is the acronym, Computer As a Persuasive Technology, (lat. persuasibilibus - enticing),. We also have to keep in mind that the Captology is 3P-technology, (Persuasive - Pervasive - Permissive). All three components in 3P technologies are related to a temporary state of mind or feeling - emotions[16-17] .

Here is the link of Human - Computer - Interaction, a Human with his emotions and computer with his Captology. This claim is the result of a research based on Larsen's cognitive controller moods model that is integrated into McLuhan's anthropological technological determination media model[18-20], **Figure 4.**
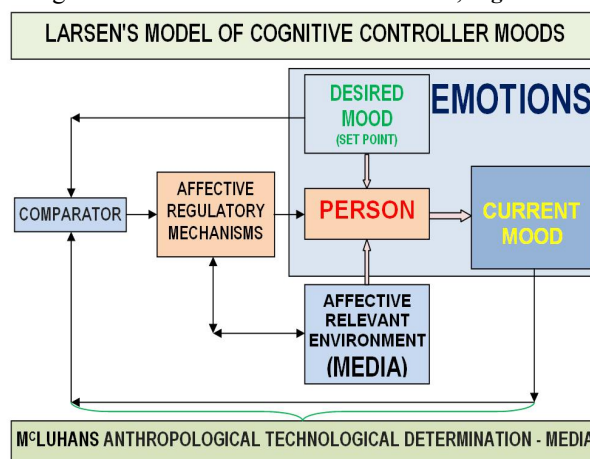

Figure 4; Conceptual McLuhan-Larsen model of cognitive controller mood in media environment emotions**.**

The research published in this paper was conducted on the principles of cognitive cybernetics. The continuation of this paper will contain concrete examples of conducted research focused on the tactile HCI component and testing through semantic differential in four groups of respondents.

2.4. Simulacrum of education

The simulacrum of education is governed by categories which, alongside information, use the model of play to dull the consciousness, and use pleasure to repeatedly enchant the idols of emptiness and superficiality of events that unfold in the cold world of rejection [21]. The knowledge that people in today's world are caught in the trap of captology was supported by Brus M. Hood[22], who stated the fact that people, as social beings, developed life in groups and as such have the ability to predict the behavior of others, to communicate and to exchange thoughts. These facts in the present time have to be observed through the prism of pluriperspectivity[23-24]. All of these skills required a mind that is sufficiently capable of comprehending that others also have a mind, which is an important determinant of education[25]. Through captological disorientation, the capacity to assume the presence of a spirit and reason in others is lost. With the introduction of computer tools and support into the educational profession, particularly those with an Integrated Development Environment (IDE), and those who assist in the recognition of logical errors, program structure analysis and substitutions through "refactoring" program code, suggests self-satisfaction. This, however, is captological self-satisfaction. The computer as an educational aid lulls the educator into a false feeling of bias and the resulting changes in attention to the detail is recognized technologically anthropomorphically as the success of the computer, even in high risk situations[26]. Anthropomorphized bias not only gives the impression of exaggerated weight of what is seen on the monitor, but also builds trust in software, which is more often left to make the decisions, and as such the educator becomes the support in decision-making. By accepting the suggestions of programs in detecting problems facilitated by computers, this lessens the attention of those being educated by it, and in such a way, it will never become successful[27].

Body and mind easily accept this new environment, and quickly introduce their routines as tools and other aids in the thought process. Neurologically, they begin to treat computers are a part of their personality, thereby recognizing anthropomorphisation[28-29].

3. Results and Discussion

The previous hypothesis "about the problematic environment of virtual, numerical, computational and interactive, is confirmed by a call to simulation of education. It is quoted by Jean Baudrillard who argues that in such environments nothing can be displayed and therefore neither memorized nor stored in deep memory. This is not a space experience as a necessary display component, some kind of stage is already a lost place - no place. It is impossible to move away and associate with any screening connection with any sensory or descriptive expressive reality.

In that absence of sensitivity and mobility, there is apathy and general indifference with the interruption of possible representation. Removing a representation causes, apart from the disappearance of an action, the impossibility of setting the necessary ethics information, image ethics, virtual and network ethics, because the matter in this respect has been removed from control.

Through technological torture instead of mental brain activity, the brain itself becomes some sort of screen that is perceived as the other side of Integral Reality.

It is born, and the brain accepts the confusion of the screen, the inability to control and circulate things that are themselves circular and that communicate with themselves. It is a fictitious perfect reality in the sense that everything is verified with its own image.

This process takes its dimension in the visual and media universe, but also in the everyday and individual life of all gestures and thoughts. This automatic breakthrough affects how the world itself perceives, leaving the mark in some way to all things by tapping them with themselves.

Such perception, as an immediate sensation, becomes aesthetic in that sense. View, hearing, touch, all senses become aesthetic in the worst sense of the word. A whole new look at things only results in a deconstruction of this repetition.

In Virtual's work, it is swallowed up in a virtual machine, in which there is no more man / machine opposition because neither is the machine recognizable when the man is on the other side of the interface.

The man is identified with the space in which he is and man becomes the virtual reality of the machine and his mirror element. As in the mirror all time dimensions are mixed in real time. And the characteristic of any virtual surface is first to be there, empty, and then be suitable for filling anything to actually interact with the void in real time.

In such interaction, everything is filled with the length, excesses, and the pernicious will of the machine to function at any cost. The Internet only simulates the mental space of freedom and discovery in which the computer dentures and with the user becomes a screen ectoplasm.

The huddled form establishes a place of happiness, but virtuality comes to happiness only because it seizes it for every reference. Reality is over by entering the virtual stage. Only virtual can at the same time deny their own reality as well as all that remains.

Virtually, therefore, it is not the last word of history, but a virtual illusion. The Illusion of the Virtual that is part of the Captological Educational Media. The alarm bell ringing in alarm calling the "Psychology of the Situation"[30-31]. But they will certainly not contribute, but only to undermine the biologically appropriate mental functioning of the brain, which is craving for the psychology of the situation because "4E Cognition" is a phenomenon that is Embodied, Embedded, Extended and Enactive[32-34].

4. Conclusions

The results presented here lead to the finding that humans have done something technical to a part of themselves. The irony of the current time is that scientists are discovering increasingly important roles of physical action and sensory observance in the development of human thoughts, memories and skills, while at the same time, humans are spending less time acting in the world, and more time living and working through the mediation an abstract medium – the computer screen. In the sense of education, the screen has become the chalkboard, upon which we once wrote in chalk and used large wooden triangles. The screen has also become the class books, in which we once wrote in ink. It was the authority doing the educating that wrote on the chalkboard and in the class book. However, with the application of captology, sensory restrictions have been forced upon the educator, disembodying and removing their authority. With the multi-purpose computer, we have succeeded, which is indeed perverse, in gaining a tool that steals away the human's physical pleasure for working with tools. Therefore, the physical comprehension and explanation of amazing ease with which the human race uses technology is a somewhat frightening idea. In education with computers, and those who are being educated, instead of being active persons become observers, looking at the screen instead of using pen and paper. In that way, their life indeed becomes easier, but their capacity to learn, master and understand their knowledge and skills declines. It is in fact from this limitation of the ability for human attention that it's use in interactions with the environment become routine, and the focus of attention of the mind selective. The assumption of an infallibility of the system, due to a lack of adequate feedback information, results in the acceptance of incorrect and incomplete information and the corresponding actions, and therefore it is oftentimes not possible to see what should have been seen.

The latest interactive display technologies and interfaces are already present in technologies for discovering new technologies. These new automation technologies, by themselves, are integral and decentralized. They are virtual information and interactive and surpass audio and visual. New ones include ecological monitors and Haptic interfaces. Their 3P active effect, (pervasively, permissively, persuasively) is still more user oriented. The imperative is to get

deeper into user experience that will not strive for the knowledge of what's going on in a technology machine, but how effectively it can communicate with I³T platforms, (I³ =, Interactive, Integrating, Information's). The current development of I³ mobile platforms will have the core of technology that will guarantee the success of the usability and efficiency of future cryptological paradigms. But experience suggests caution through cognitive cybernetics and captosophy.

Conflict of Interest and Funding

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