Thirty Years Later—

The Informational and the Evolution of Consciousness

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Abstract. *The paper deals with the development of the informational since the IFIP 1971 Congress in Ljubljana when the new consciousness evolved to the necessity of nowadays informational society. A new methodological and technological challenge enters into the view of the future information systems, their design and implementation. The challenge is called informational consciousness—the human and the artificial one.*

Ladies and Gentlemen, good morning! Mr. Chairman, thank you very much for inviting me to speak to the International Conference concerning the Field of Information Systems in Europe, and particularly in the Middle Europe and Eastern Europe, and worldwide. The subtitle of my address is **The Informational and the Evolution of Consciousness** (see Fig. 1).

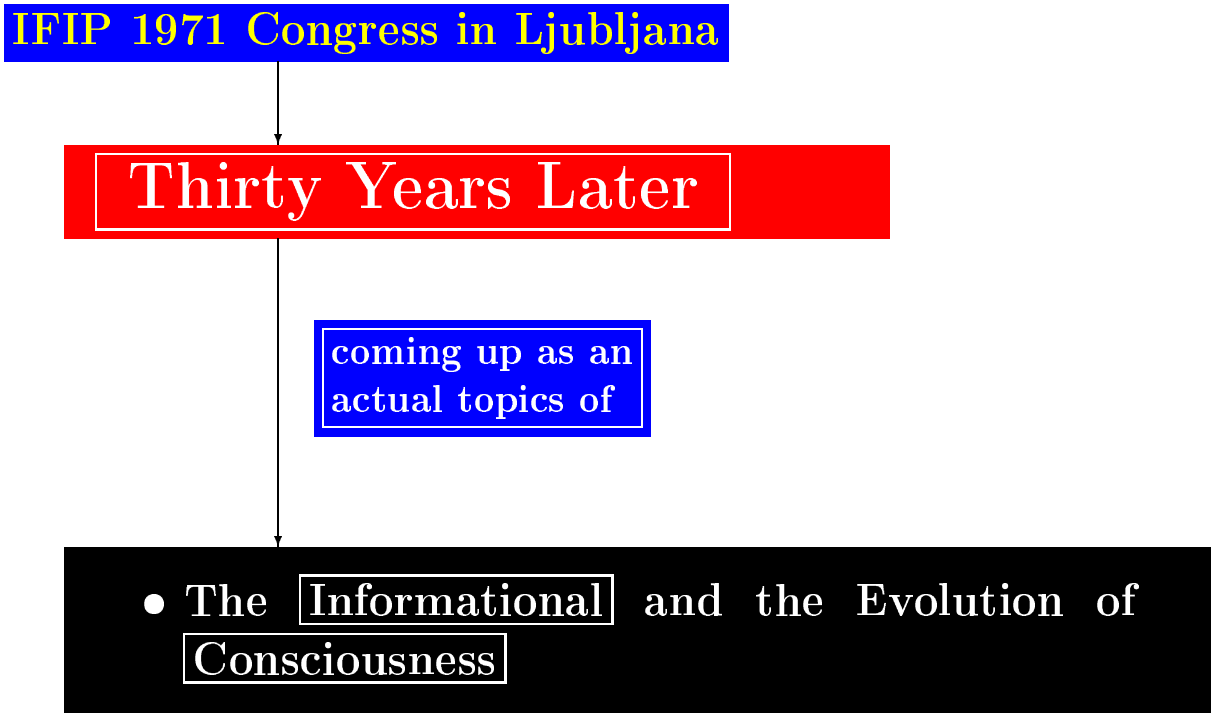

Figure 1: Thirty year later, since 1971 IFIP Congress in Ljubljana, the advance of the informational and the change in global consciousness become evident.

Thirty years ago, at the IFIP '71 Congress in Ljubljana, nobody could foresee the advances in development in the field of the informational (see Fig. 2), that is, of

Figure 2: The time of bringing forward the informational consciousness.

social, philosophical, computational, communicational, methodological, technological, scientific, theoretical, applicative, organizational, and managerial.

Thirty years in the informational development is an exceptionally long period of surprise, experience, change, and the evolution of consciousness, although thirty years is only a good half of the average professional working life. No a participant of the IFIP 1971 Congress in Ljubljana could predict the technological and methodological progress happened in the field of computer science, artificial intelligence, and information systems in the last thirty years (see Fig. 3). Much more surprising than the advance of the theoretical and applied computer science was the revolution in the design and manufacturing of computer technology—hardware and software—setting new standards in application possibilities, operation speed, large memory arrays, net accessibility and net communication. Thus, information processing system and communication network, called the World Wide Web, could come into existence. As a consequence, the Internet became the largest communication and working information system and information environment with its own consciousness, constituted by the man-machine interface structure and organization. Kevin Kelly, the executive editor of Wired explained why the users of Internet are constitutionally not able to comprehend the emergent consciousness of the web (Kelly, 1998 [**?**]).

The organization of a computer system, its informational structure and the human interaction within an information system, could emerge diversely in goals and implementation. In the beginning of 1960's, that which astonished me mostly and substantially, was the possibility to write a program for a complex mathematical recursive function in Algol 60. How could it happen that mathematics most profound concept of recursive function entered directly, in the form as it was expressed mathematically, into the domain of the program executing digital machine? Recursiveness expressed by the program circularity was a kind of imitation happening in human consciousness controlling the process of directed or intentional reasoning, human logical inference and the resulting conclusion. Do we today already tend to have on the disposal something called artificial consciousness incorporated in an informational system for generating unpredictably sophisticated reports, helping the management in decision-making by a real, new, and efficiently constructed information?

Today, the traditional understanding of urbanization takes over the comprehension of populations' information access and orientation in the form of the common intention, philosophy, and trends of civilization development, exploring informational organization in management and decision-making, and in informational production governed by new technology, communication, robotization, and work automation. These kinds of topic are evident prerogatives of the so-called informational society in the West and, simultaneously, a global must for the future survival and development of human civilization. The term information society used in Europe does not reflect entirely the consciousness of the informational as an emerging new possibility in mentality, approach, formalism, and implementation of minds and machines. As always in the history of culture, megalopolises show the way of development, in fact, if one takes the history sufficiently precise, megalopolises reveal the informational evolution of human consciousness and the corresponding human activity, for instance, as a realm of mind-body evolution within the rationalistic and scientifically grounded circular physical, informational, and phenomenal supervenience (Železnikar, 2001 [**?**]) (see Fig 4).

At the crossing of the nineteenth and twentieth century, an explicit philosophy of consciousness, called *phenomenology* (Husserl, 1900 , 1913 [**?**, **?**]), takes its breakthrough and begins to prepare the way for evolution of informational concepts, mathematics, and tech-

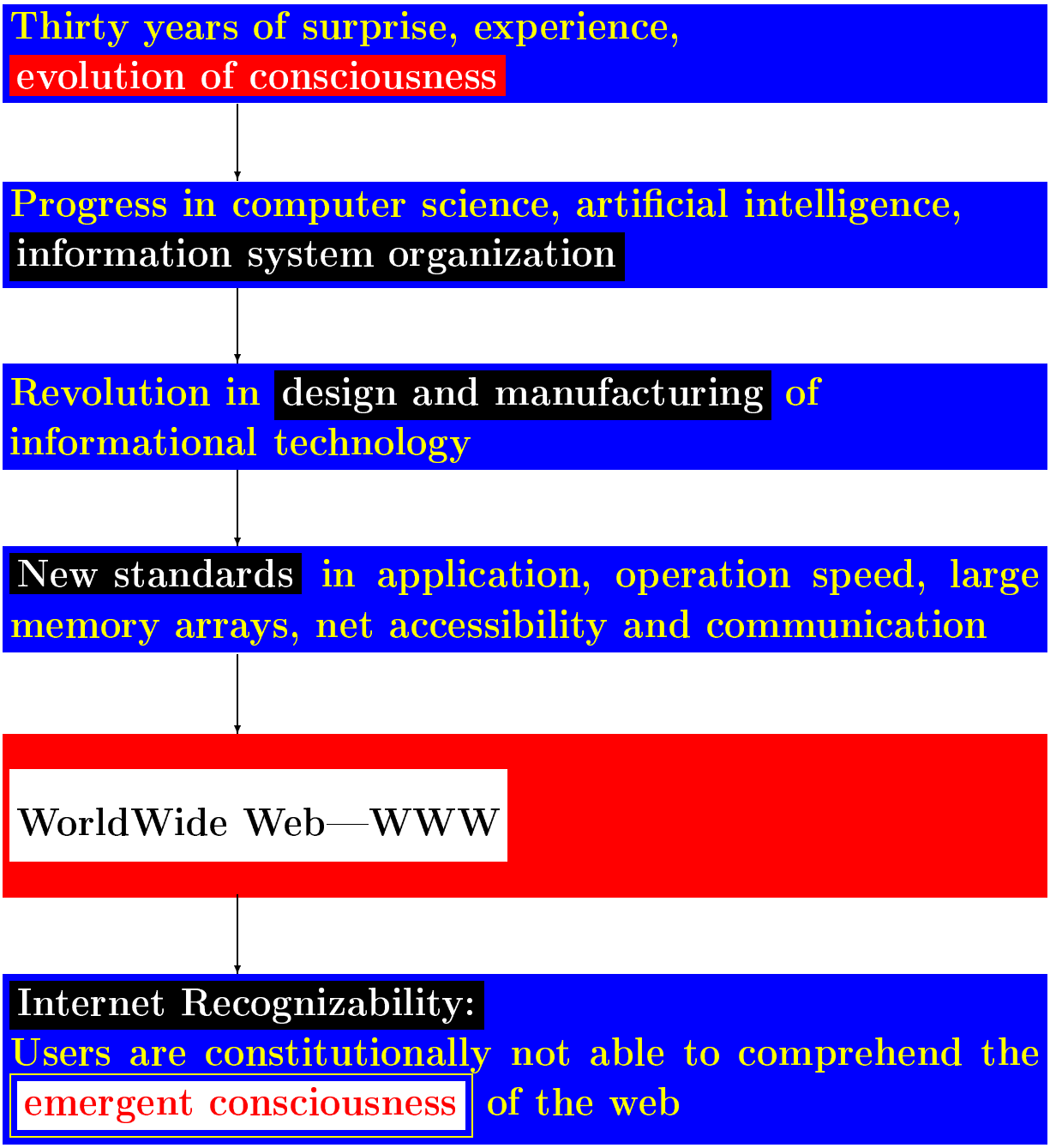

Figure 3: In the last thirty years human consciousness has advanced particularly in the field of the informational, where WWW demonstrates an emergent consciousness not yet comprehended constitutionally by the users.

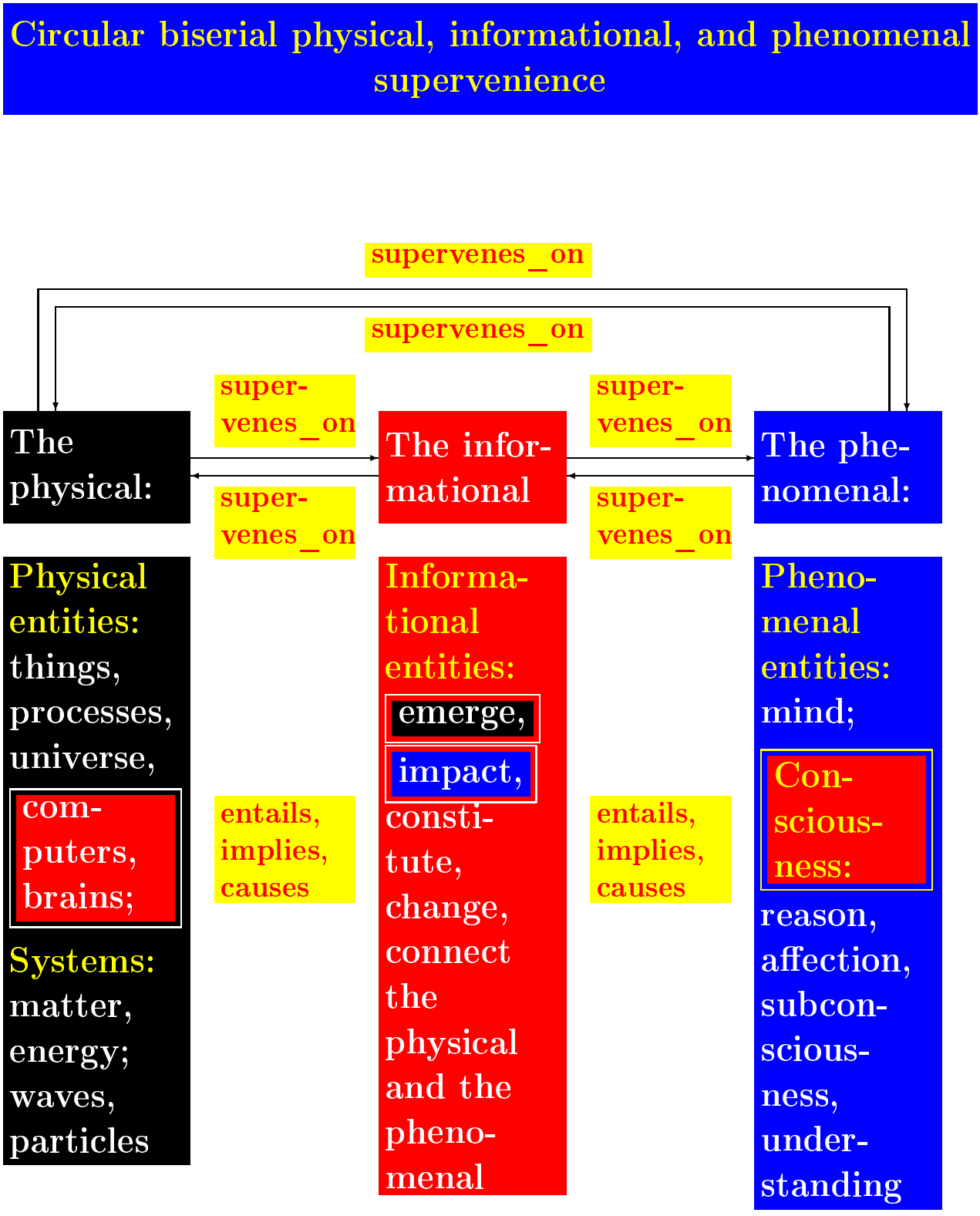

Figure 4: Today, an interconnection of the physical, informational, and phenomenal pervades essentially the understanding of human consciousness.

nology. Von Neumann's computer model implemented in 1940's, also as a consequence of the logical positivism of the Vienna Circle in 1920's and 1930's, is one of the results of the then positivism, scientific worldview, and phenomenological orientation.

For Paris, perception, memory, and the nature of time are part of a concern that is part of a vast Parisian thought-complex, one shared by Bergson ... (Thompson, 2000 [?]) (see Fig. 5). In Paris, at the time between 1851 and 1914, the consciousness of dynamical mentality arises out of a phenomenology of culture being reflexive in time and reflective in space. For New York, Manhattan Transfer of John Dos Passos performs self-consciously as a modernist fiction in the narrative techniques of collage and quick cuts of simultaneity that focus on the phase space of the 'now' and prefigure the narrative techniques that have taken over television story telling ... (Thompson, 2000). For Los Angeles, with Crying of Lot 49 of Thomas Pynchon, the chaotic informational overload of the megalopolis generates a new landscape of fantasy-identity, conspiracy theories, and paranoid reintegration. Paranoia as a mad system of informational integration is a shadow formation that paradoxically throws light upon the shift from post-industrial to informational society; it is a caricature of the cultural transition from the world metropolis to the planetary noetic polity in which the territorial nation-state dissolves in visions of globalist associations (Thompson, 2000 [?]).

Both nineteenth-century Paris and twentieth-century New York are examples of the city evolving from the materialist and capitalistic city into the informational noetic polity, one in which an overlapping moiré of economic centre, artistic centre, and intellectual centre creates a pattern in which no single institution is imperialistically in control, thus an emergent state comes forth in which consciousness moves to a level above the traditional formations of an urban civilization. Since ever this contemporary manifestation of urban form now seems to be simply a node of the planetary informational lattice of the World Wide Web, it is hard to prophesy just where this contemporary noetic polity is taking us in cultural evolution (Thompson, 2000 [?]).

Consciousness is an emergent informational entity of the nervous system. Phylogeny and neurology of the reasoning about and emotion help us understand how informational abilities of consciousness depend on dynamic organization of the nervous system, producing mental and physical behavior (Johnston, 1999 [?]). The most profound evolutionary function of consciousness is to produce meaning in the form of informational systems, organizing the informational and behavioral interaction, acquiring experience, motivation, conceptualization, sensibility, and perception. By the conscious informational system, individual informational components lumping around and emerging up to the conscious level, are taken and embedded interactively into the stream of the current intentional informing. In this way, consciousness as an informational phenomenon happens to us (Železnikar, 2001 [?]).

It seems evident that the aim of the informational roots in the organization of consciousness, and that the both become synonymous to each other. Consciousness is an informational activity and its development is an enlargement of the complex meaning, informing phenomenally within the existing and emerging informational domain. In the informational, only *emerging decides what can become the meaning of an informational entity* through a reasonable and precise, however also objective, responsible, and open interpretation of the entity.

Evidently, the progress of the future information system organization is in human-computer interactive artificial or, more precise, informational consciousness, organized on the informationally emergent web performing spontaneously and circularly (repeatedly) (see Fig. 6). For the participants of the conference a special insight into the project document

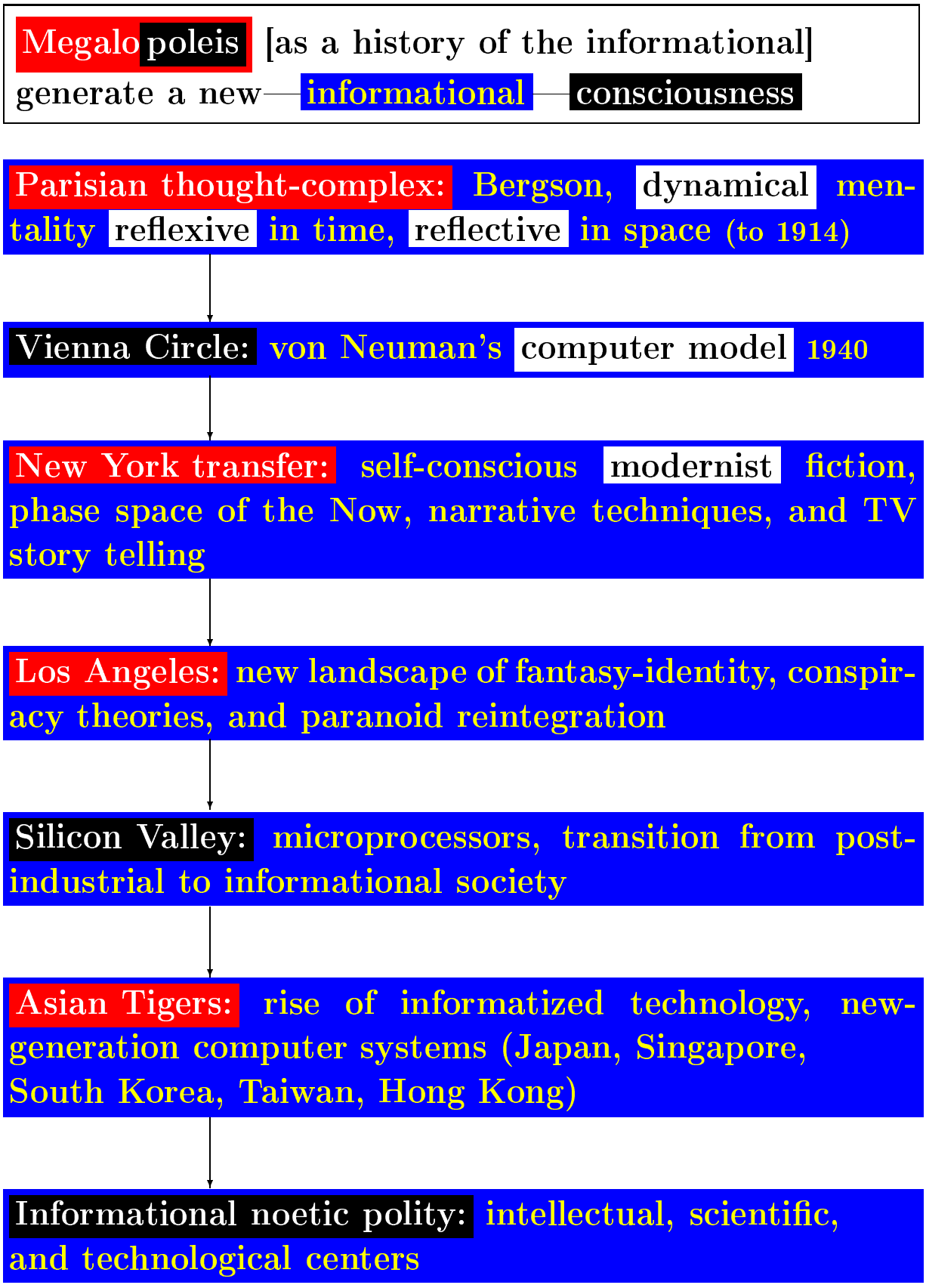

Figure 5: Megalopoleis as generators of the new consciousness in Europe, America and Asia, where informational society comes into the foreground of human life.

Conscious information systems—natural and artificial (WWW)—can produce meaning for intentional interaction in behavior, experience, motivation, concept, sense and percept

The informational is the substrate of the conscious. Consciousness is an informational activity.

In the informational, only emerging decides what can become a meaning in a dynamic situation.

Information systems approach to the step of informational consciousness, performing intentionally, spontaneously and circularly.

The theory, methodology, and formal apparatus are presented in the A.P. Železnikar's book

"Introduction to Artificial Consciousness"

The book and this lecture, together with slides and more, is visible and printable free of charge at http://www.artifico.org and via a discussion forum http://groups.yahoo.com/group/artifico

Figure 6: Introducing the methodology of artificial consciousness into the field of information system reporting.

entitled Introduction to Artificial Consciousness: An Informational Approach, Formalization and Implementation (Železnikar, 2001 [**?**]) will be available. Participants of the Conference will have the opportunity to look into the document via the Conference Internet terminals. So let's spread the possibility of information systems to develop as systemically organized conscious devices, like a meme [1], replicating in the information system community worldwide. So, let me wish a success to the Conference, thanks to the organizers, and a pleasant stay in Bled to the participants and the guests. Thank you!

References

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