

TWENTY QUESTIONS ABOUT A UNIFIED THEORY OF INFORMATION

A Short Exploration into Information from a Complex
Systems View

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Wolfgang Hofkirchner



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P U B L I C A T I O N S

*Twenty Questions About a Unified Theory of Information:
A Short Exploration into Information from a Complex Systems
View*

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CONTENTS

Preface.....	1
Q1. A unified theory of information (UTI)— what’s it for?.....	3
Q2. What makes a UTI distinct from ‘normal science’ information studies?	11
Q3. What is the extension of the concept of information in a UTI?	17
Q4. What are the theories/concepts of information that a UTI attempts to unify?	21
Q5. How can unification be achieved?	27
Q6. What is the meaning of Capurro’s trilemma with regard to the attempts of unification?	35
Q7. Is a UTI similar to a Grand Unified Theory (GUT) or a Theory of Everything (TOE)?	43
Q8. Is information possible in a mechanistic universe?	49
Q9. What can we learn from the new paradigm of complexity?	53
Q10. How is information related to self-organization?	61
Q11. What is the role of sign processes in a UTI?	67
Q12. How can we differentiate self-organization?	75

Q13. Pattern formation in material systems— is it generation of information?	85
Q14. What makes living systems code-makers?	89
Q15. Is the constitution of sense in human systems distinct from code-making?	95
Q16. How is the Triple-C model engaged with evolutionary systems?	99
Q17. What are the physico-chemical origins of cognition, communication and cooperation?	111
Q18. What are the peculiarities of bio-cognition, bio-communication and bio-cooperation?	115
Q19. What are the peculiarities of human cognition, communication and cooperation?	121
Q20. Why do we need collective intelligence on a planetary scale?	131
References.....	139
About the author.....	151

TABLES AND FIGURES

Figure 1 From Industrial Societies to Information Societies.....	4
Table 1 Capurro's Trilemma.....	35
Table 2 Ways of Thinking	37
Figure 2 Strict Determinism	51
Figure 3 Less-Than-Strict Determinism	57
Figure 4 Trajectories in Self-Organizing Systems.....	58
Figure 5 Trajectories in Mechanical Systems.....	58
Table 3 The Ancient Concept of Informatio/ Informare	64
Figure 6 Subject-Object Dialectic.....	69
Figure 7 Designation as Sign-Mediated Subject-Object Dialectic.....	70
Figure 8 A Semiotic Triangle Compatible with Subject-Object Dialectic.....	71
Figure 9 Aristotle's Four Causes Revisited	77
Figure 10 Typology of Self-Organizing Systems According to the Rise of Subjectiveness	79
Figure 11 Pattern Formation as a One-Level Architecture of Self-Organization	87
Figure 12 Code-Making as a Two-Level Architecture of Self-Organization	90
Figure 13 Constitution of Sense as Three-Level Architecture of Self-Organization	96
Figure 14 Cognition Dimension.....	101
Figure 15 Communication Dimension	101
Figure 16 Cooperation Dimension	102
Figure 17 Cognition	104
Figure 18 Communication	105
Figure 19 Cooperation 1.....	107
Figure 20 Cooperation 2.....	107

Table 4 Information Categories.....	112
Figure 21 Layer Model of Bio-Cognition.....	116
Figure 22 Layer Model of Bio-Communication	117
Figure 23 Layer Model of Bio-Cooperation	119
Figure 24 Layer Model of Human Cognition.....	122
Figure 25 Layer Model of Human Communication.....	123
Figure 26 Layer Model of Human Cooperation.....	124
Figure 27 Evolution of Cognizability.....	127
Figure 28 Evolution of Communicability.....	128
Figure 29 Evolution of Cooperability	128
Figure 30 From Evolution of Consciousness to Conscious Evolution	134

PREFACE

This timely booklet will be released on the eve of the first-ever international conference 'Towards a New Science of Information', held in Beijing on 20–23 August, 2010.

This is a short introduction into what I and my co-workers, especially from my UTI Research Group in Vienna, have been used to calling 'Unified Theory of Information (UTI)'. UTI may thus be regarded as a specific proposal of what theoretical foundations of a new science of information could look like, and tries to connect complex systems thinking to systems philosophy and extend it to the field of information studies.

Since this approach was recognized by Rafael Capurro and Birger Hjørland (2003), as well as Luciano Floridi (2004), several refinements have been made to our framework. This booklet presents elaborations in a concise format which I hope makes it an easy read. The chapters might be read independently but there is a thread that connects them.

I owe special thanks to Kurt Richardson who made this publication possible in a very short time.

The text is based upon, and is a major revision of, another text I wrote in 2007/2008 and which was published under the Creative Commons License (2009). Three chapters underwent substantial change, figures were redrawn, one chapter was completely rewritten and a new chapter was added, while another one was omitted.

Many changes are owed to intensive discussions with Francisco Salto Alemany and José María Díaz Nafria during my stay at the University of León in the fall of 2009.

Wolfgang Hofkirchner
Barcelona, May 2010

Q1. A UNIFIED THEORY OF INFORMATION (UTI)— WHAT'S IT FOR?

At first glance, it seems an intra-scientific issue of whether or not in the field of information there is an attempt to grasp the big picture and develop a shared theory by which the whole variety of different manifestations of information processes in society and in the world at all might be understood. As in everyday thinking where people strive to connect unconnected experiences and even reconcile irreconcilable experiences, in order to arrive at a coherent overall view, so science is heading for 'consilience'. This term attracted interest when Edward O. Wilson published his book of the same title (1998), and is a unity of knowledge that allows for better explanations and predictions. This is accomplished via the construction of new theories that include the findings of old theories as approximations and, at the same time, are able to explain and predict phenomena that were not covered by the old theories. Thus, in science, there is a tendency towards more overarching theories, more generalizing theories and more universal theories. Unified theories address the universal by unifying the multiplicity of as yet incoherent theories bound to particular levels. Unified theories belong to the intra-scientific progress towards the universal.

However, it is not just a case of pure scientific curiosity. If we take into account that science is not kept within an ivory tower but is a social undertaking that satisfies social demands, then it does not come as a surprise that, on the threshold of the 'Information Age', science is concerned

with information and that there is a quest for a unified theory of information (UTI) (Hofkirchner, 1999).

The Information Age is the age of information societies into which industrialized societies are transforming, and which is visible by the spread of new information and communication technologies (ICTs), while the 'Industrial Age' is the age of industrial societies into which agricultural societies have been transforming worldwide. Each transformation is known as a 'revolution' and all revolutions together are said to form the evolution of civilization (see Figure 1).

On one hand, there is a lag of scientific development behind societal and technological development. Development in technology is not accompanied by an equally rapid growth in scientific insight, let alone foresight, into the impacts of technology on society.

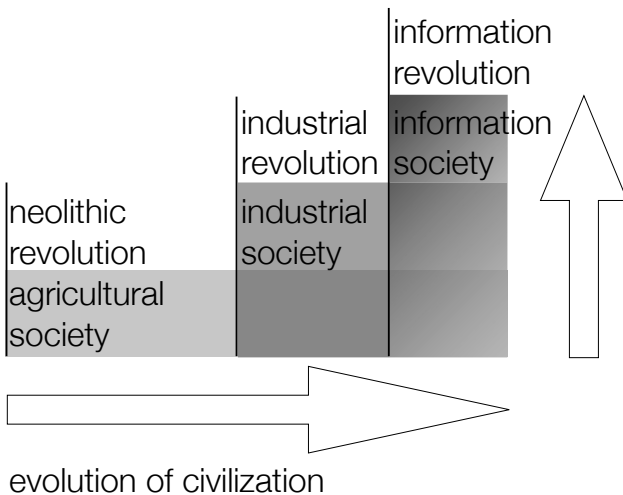


Figure 1 From Industrial Societies to Information Societies

Attempts to observe and understand the basic nature of this change still take second place. The public use of the term 'information society' has been reduced to denoting a society in which applications of modern ICT are spread widely in order to facilitate the handling of what is commonly called 'information'. A scientific understanding of this transformation has not had time to develop. There is not yet a proper 'science of the information society' nor a proper 'science of information'.

On the other hand, the state of the relationship between science and modern techno-social development regarding information can, for example, be compared to the state with which Karl Marx was confronted with regard to work. In his time work could become, and became, a matter of scientific interest, since work gained a new role in society and became more abstract in social life; that is, it was treated in society irrespective of its concrete characteristics. Marx called that a 'real-abstraction'; an abstraction that occurred in reality owing to the real treatment of work in the emerging capitalism which became the basis for the general concept of work in scientific thought. It was only then that the concept of work could be stretched back to former social life in the history of humanity, as well as other phenomena than industrial work which could be subsumed under the concept of work, albeit as different manifestations. Making use of this notion of real-abstraction we might assume that, nowadays, information has gained as decisive a role in society, in order to foster a new scientific concept and theorizing; that it has turned into a real-abstraction which is the rationale for devising a general idea as well. How work is regarded in human history, when seen from the

perspective of industrial society, so, too, is information regarded in history when viewed from the perspective of information society.

What then has changed with information? Is it just the quantity of what can be conveyed by ICTs? Or is the quantity of information just the indication for a qualitative change taking place?

There has been a qualitative change in the role information can play for the development of society, and this change is unprecedented in the history of humanity. Information has become the bearer of survival, the key to our future. The information age is, fundamentally, the age of global challenges. The impressions made by the atomic bomb, industrial and agricultural catastrophes, hunger, suffering and death in the poor parts of the world, starting in the middle of the twentieth century but persistent in the new millennium, have raised consciousness of the destructive and fallible nature of the human technosphere, the fragile and finite nature of the human ecosphere, and the unsettled, unbalanced nature of the human sociosphere.

It is generally known that the existence of such global challenges can endanger today's societies all over the world. The global problems are global in a twofold sense: first, they concern humankind as a whole (as an object); second, they can only be solved by humankind as a whole (as a subject). The risk this crisis carries is that humankind may be wiped out. The chance it offers, however, is that humankind may be raised to another level of humanity.

It is disparities in the development of the relationships amongst humans, between humans and nature and between humans and technology, that create obstacles to keeping society as a whole on a stable, steady path of development. It is malfunctions in the sociosphere, ecosphere and technosphere that continue to aggravate the global challenges. And it is information that turns out the only remedy. It is information that is required to steer society. It is information that is required to reorganize humanity onto a higher level of organization. It is information that is required to alleviate and reduce the frictions (Heylighen, 2008) in the functioning of those systems that make up humanity: from the individual to different ethnic groups to nations to world society; from economy to politics to culture, from society to ecology to technology; from the social realm to the biotic realm to the physical realm.

In a word, the continued existence of humanity has shaped up as impossible without conscious and cautious intervention in the process of its own development. This intervention that is moving towards the reconnection of our disintegrating world—which is falling apart owing to processes of heterogenization, fragmentation and disintegration—is informational in nature, but as it extends from the human sphere to the living sphere to the material sphere, it necessitates a deep understanding of the information processes going on in the world we inhabit.

Knowledge as capacity to act means that today the capacity to act vis-à-vis global challenges means

knowledge about how information guides the processes that put us at risk. Hence information is the *conditio sine qua non* for the further existence and development of humanity.

From this perspective, a UTI makes sense.

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Wolfgang Hofkirchner was born in 1953 in Vienna, Austria. Being educated as Political Scientist and Psychologist, he has been working since in the field of Science–Technology–Society. He has performed research and teaching at the Austrian Academy of Sciences; the Vienna University of Technology; the Federal University of Bahía, Salvador, Brazil; the Paris-Lodron University of Salzburg, Austria; the University of León, Spain; and the Open University of Catalonia, Barcelona. He founded the Unified Theory of Information Research Group, the open-access online journal for a Global Sustainable Information Society, triple-C, is director of the Bertalanffy Center for the Study of Systems Science, and member of the board of directors of the Science of Information Institute, Washington. His current focus is on an integrative science of information, information society and information technology. The perspective taken is that of complexity thinking underpinned by considerations rooted in philosophy while extending to ICTs and society.

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