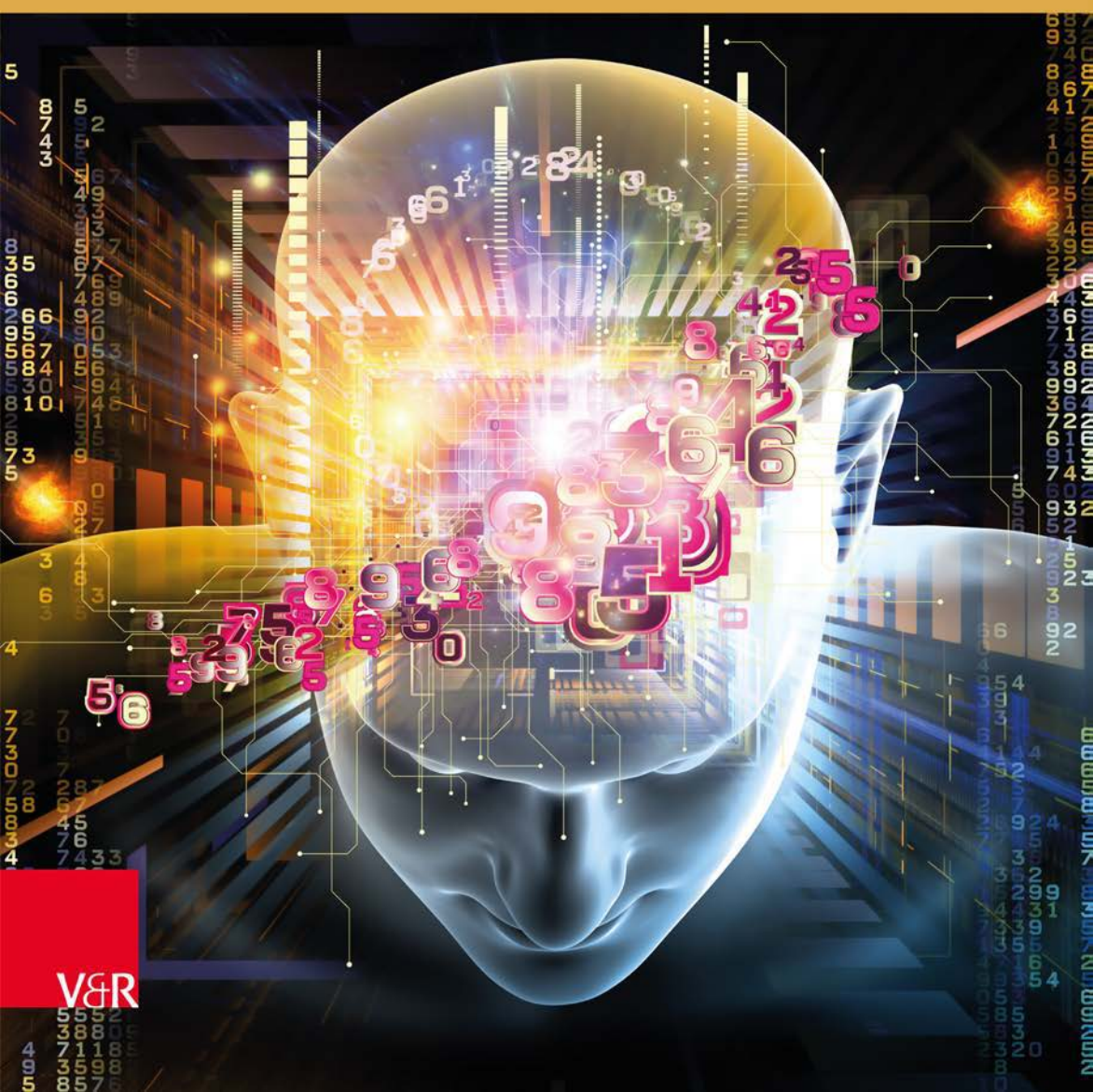
Hardy F. Schloer / Mihai I. Spariosu

The Quantum Relations Principle

Managing our Future in the Age of Intelligent Machines



V&R

V&R Academic

NATIONAL TAIWAN
UNIVERSITY PRESS

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Reflections on (In)Humanity

Volume 9

Edited by
Sorin Antohi, Chun-Chieh Huang and Jörn Rüsen



Assistant Editors: Stefan Jordan (München), Marius Turda (Oxford)
Editorial Assistant: Angelika Wulff (Witten)
Editorial Board: Aziz Al-Azmeh (Budapest), Hubert Cancik (Berlin), Dipesh Chakrabarty (Chicago), Pumla Gobodo-Madizikela (Cape Town), Moshe Idel (Jerusalem), Oliver Kozlarek (Morelia), Grazia Marchianò (Montepulciano), Jutta Scherrer (Paris / Berlin), Hayden White (Santa Cruz), Zhang Longxi (Hong Kong)

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Hardy F. Schloer / Mihai I. Spariosu

The Quantum Relations Principle

Managing our Future in the Age of Intelligent Machines

With 31 figures

V&R unipress

National Taiwan University Press

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Published in cooperation with the Institute for Advanced Studies in Humanities and Social Sciences, National Taiwan University.



This book series is sponsored by the Orbis Tertius Association, Bucharest.



Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available online: http://dnb.d-nb.de.

ISSN 2198-5278
ISBN 978-3-8470-0662-6

You can find alternative editions of this book and additional material on our website: www.v-r.de

This work was supported by a grant from the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, project number PN-II-ID-PCE-2011-3-0771.

© 2016 by V&R unipress GmbH, 37079 Goettingen, Germany
© 2016 by National Taiwan University Press, Taipei, Taiwan
All rights reserved. No part of this work may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without prior written permission from the publisher.
Cover image: © shutterstock.com
Page 2: Engraving by Johann Heinrich Meyer for the title page of Johann Gottfried Herder, *Briefe zur Beförderung der Humanität*

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

"Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand." — Albert Einstein

"It will, of course, be said that such a scheme as is set forth here is quite unpractical and goes against human nature. This is perfectly true. It is unpractical and goes against human nature. This is why it is worth carrying out, and that is why one proposes it. For what is a practical scheme? A practical scheme is either a scheme that is already in existence, or a scheme that could be carried out under existing conditions. But it is exactly the existing conditions that one objects to; and any scheme that could accept these conditions is wrong and foolish. The conditions will be done away with, and human nature will change. The only thing that one really knows about human nature is that it changes." — Oscar Wilde

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Contents

Preface 9

Acknowledgements 19

Part One.
The Quantum Relations Principle: Theoretical Foundations

Chapter 1. What is the Quantum Relations Principle? 23

Chapter 2. Why is Quantum Relations Quantum? 33

Chapter 3. The Quantum Relations Principle as Computational Tool . . 49

Chapter 4. Quantum Relations Theory: Philosophical Underpinnings and Ethical Implications 77

Part Two.
The Quantum Relations Technology: Global Applications

Chapter 5. The Operating System of the Quantum Relations Technology: The Interactive Search, Analysis and Transaction Environment 93

Chapter 6. The Global Value Exchange: Managing Commerce in the 21st Century 111

Chapter 7. The Global Healthcare Exchange: Managing Human Services in the 21st Century 139

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Chapter 8. Planetary Network of Intercultural Centers for Integrative Knowledge, Technology, and Human Development: Managing Global Learning and Research in the 21st Century 181

In Lieu of Conclusion 207

Brief History of the Quantum Relations Principle 215

Bibliographical References 217

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Preface

The world is in turmoil all around us. For the past two decades, nation-states have been on the move, realigning their political orientations, associations, and systems of values and beliefs. At an increasingly fast pace, old countries and empires are collapsing, and new societies and nations are born. Unfortunately, war, ethnic and religious cleansing, torture, social and political injustice, unfair or oppressive commercial competition and irresponsible financial behavior on a global scale have also become part of this process of radical change.

Perhaps at no other time in human history have local and global leaders been more challenged than now to find the right path to a sustainable future for humankind. The lack of clean and affordable energy, the diminishing supply of clean water, the imminent global collapse of the food supply to a vastly expanding human population, the fast growth of pollution due to the increasing industrialization of large nations, climate change issues, ever-sharpening conflicts due to the unequal access of many communities to natural resources and affordable technological solutions, and the impasse of philosophical and ideological differences, all of these are factors that decision-makers are called on to accept as reality and, therefore, find solutions to.

To compound the problem, the effectiveness and speed of contemporary communication technologies and public media allow local and global leaders little time to catch their breath and carefully consider their actions. Momentous decisions must be made almost instantaneously, in real-time, often with unforeseen, devastating consequences for humanity. This escalation in speed and volume of flawed political, economic, and environmental decision-making has produced an avalanche of global instability and uncontrolled change, which has led, in turn, to more turmoil and confusion at all levels.

And yet, this global crisis can also be seen as a unique opportunity for further human development. Because several important shifts are now occurring simultaneously, they are creating a perfect time storm, so that current and future human actions can be radically transformed. In the last three decades alone, we have made tremendous progress in devising new, environmentally responsible

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

technologies and novel methods of applying traditional ones. Biology, physics, chemistry and medicine lead this progress, side by side with information and communication technologies. We have all the tools at our fingertips to transform this planet into a sustainable global community.

We need to act now, however, and must be willing to develop and use these new tools not only in an intelligent, but also in a wise manner. We can no longer get by with partial patchworks of fixes and need to begin thinking in terms of interrelated and integrated scientific and technological strategies to repair the negative, unintended consequences of the modern age of industrialization and globalization. Above all, we need to embrace science and technology as tools for our higher, ethical development, instead of abusing them for destructive, competitive, and selfish or greedy purposes. In other words, we need also to be willing to undergo a spiritual transformation, a radical change in our present mentality.

We need not only to become educated about the consequences of our decisions, but also begin to understand the complicated interrelations and hidden dependencies of global reality. This complex, fast-moving reality requires a fully committed approach and willingness to investigate and understand the issues at hand, across all ideologies, philosophies, societies, and nations. Thus, the world in all its facets must become intercultural and transdisciplinary. This is as true for economical and political realities, as it is true for science, technology and education. Studies of problems, decisions, and implementations of policy need to be carried out through an integrated and transformative global partnership, based on full global awareness.

In short, we need to refocus and look at our planet as a multilevel, integrated system. Our global community needs to start functioning as a harmonious whole, much like a very complex super-organism, perpetually in a learning mode and flexible enough to make the vital adjustments and changes necessary for its continued wellbeing. Two previous books, *Global Intelligence and Human Development* (Spariosu 2005) and *Remapping Knowledge* (Spariosu 2006), have laid out the foundational principles and collective actions needed to set us on the road to building an intelligent planet. The present book, which can best be read in conjunction with the other two, continues to describe the kind of conceptual and technological tools needed to further human development toward global intelligence. We define global intelligence as the ability to understand, respond to, and work toward what is in the best interest of and will benefit all human beings and all other life on our planet. This kind of responsive understanding and action can only emerge from continuing intercultural research, dialogue, negotiation, and mutual cooperation; in other words, it is interactive, and no single national or supranational instance or authority can predetermine its outcome. Thus, global intelligence, or intercultural responsive understanding

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

and action, is what contemporary nonlinear science calls an emergent phenomenon, involving lifelong learning processes.

The Quantum Relations Principle is precisely such an integrated conceptual and technological tool, designed to move us, humans, one step farther not only toward global intelligence, but also toward planetary wisdom. In Part One of the book, we lay out the scientific and philosophical foundations of the Quantum Relations Principle (QR for short). QR creatively combines the insights of the theory of relativity, quantum mechanics, general systems theory, and contemporary cognitive and social science, in order to bring together, in transdisciplinary fashion, the study of physical phenomena with that of mental and social phenomena. In computer science, QR is a revolutionary, theoretical and practical measuring tool that allows us to take into account, simultaneously, the experiences of multiple observers (humans and/or machines) of the same event or series of events. It helps us build dynamic models of reality that can measure the interactions of mutual causality among various observers and can make reasonably accurate assumptions about how they may behave and affect each other in the future.

In the first two chapters of Part One, we outline the scientific foundations of QR in relation to quantum physics and the theory of relativity. From quantum mechanics we borrow the idea of quanta (the smallest units or "elementary particles" of observed reality that cannot be further reduced within the theory), as well as the principle of uncertainty, extending them to the human mind and social phenomena. From Einstein's theory of relativity, we borrow the idea that objects carry their own frame of reference with them, and that their interactions (making a measurement, for example) are determined by the rules that govern those frames of reference. Thus, QR theory provides a description of the elements, structures, and interactions between objects as they evolve over time. The crucial difference from quantum physics and relativity theory, however, is that in Quantum Relations objects need not be physical. They can also be concepts, relationships, or sets of mental, emotional, and social objects. QR attempts to derive, for each such set, the rules that govern the interactions of the objects in the set, as well as the interactions of different sets.

In Chapter 3 we describe the basic principles of computation and the main computational features of Quantum Relations. QR revolves around two fundamental concepts that can equally be translated into the mathematical language of quantum mechanics and constitute the cornerstones of any technology platform based on the QR principle. These concepts are "data fusion objects" (DFOs) and "frames of reference" (FORs). Data fusion objects or DFOs can be defined as mental quanta or elementary particles. They interact according to well-defined rules, and the result of their interaction can equally become a computed function. DFOs arise within multiple FORs. Each FOR can be represented as a metric

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

space, i. e., as a set of DFO elements, with one or more functions. Furthermore, a FOR can also be a DFO and vice versa, depending on their respective positions in the hierarchic space structure. Thus, a DFO can be an elementary particle in a higher-level FOR. In turn, this FOR can be a DFO of another, higher-level FOR structure, and so forth.

The DFO/FOR model has many technical advantages, including self-adaptability: it will automatically search for the best method and the shortest path to accomplish its goal. Even more importantly, the DFO/FOR model is capable of self-organization, because data and functions are implemented as sets of hierarchical objects. A FOR containing many DFO structures can also contain rules for the creation of new DFOs, the interaction between its DFOs, and the calculation of functions between smaller DFOs, including the creation of new objects that embody certain relationships between these smaller DFOs. Thus, DFOs and FORs provide a natural model for general parallel computation. Since DFOs and FORs are discrete objects, they can be implemented on multiple processor systems, and calculations can be performed in parallel.

Furthermore, the DFO/FOR model is both modular and extensible. This means that a set of computations on one data set can be transformed into another data set and used by the second data set to define a third set of new functions, translating the preceding FOR into the new one. In addition, a FOR can contain rules for logical inference and deduction that operate on its component DFO objects. The fact that FORs are also considered DFOs for higher-level frames allows lower-level frames to define data properties. DFOs could equally be used to pose queries on other DFO frames. It can thus translate and incorporate any software program or computer language into its database, thus solving the currently intractable problem of systemic compatibility and interchangeability in computer programming.

In addition, the DFO/FOR model is compact and adaptable, expressly designed to handle extremely large quantities of data, on the scale of gigabyte and terabyte sets, and to provide methods for manipulating them through parallel processing systems. The model can handle data storage, recuperation, and processing with great flexibility and practically no data loss. It assumes that no piece of information or knowledge from its database can ever become obsolete, because it may always turn out to be relevant in a different DFO/FOR configuration or correlation between data sets.

Finally, in the last chapter of Part One, we place the Quantum Relations Principle in a larger philosophical context and point out its global ethical implications. QR shares the theoretical advantages of general systems theory and its offshoots, the theories of complexity and self-organization, over their scientific, reductionist counterparts, especially within a global reference frame. The DFO/FOR model is based on the "web of life" (Capra 1997) in its most diverse

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

and complex aspects, including human relations and interactions. Unlike most reductionist scientific theories, QR implicitly acknowledges diversity and alterity as the very conditions of existence. It can take into account and process widely different cognitive perspectives, including linguistic, philosophical, cultural, sexual, and other observer-dependent variables.

Like other contemporary strands of systems theory, QR acknowledges that hierarchies as modes of organization are best understood not as "centers of command and control," but as reference frames or levels of complexity embedded or nestled within each other and engaged in constant communication and mutual interaction. QR thus supports and enhances a cooperative, symbiotic view of our universe, in which all living and nonliving components of the global system and subsystems depend on each other for their well-being and in which each perspective needs to be acknowledged and respected as potentially valuable for the common good.

Another theoretical advantage of QR within a global reference frame is that it shares the nonlinear views of the ancient tradition of wisdom, or the *philosophia perennis* as Leibnitz called it. We briefly examine such concepts as mutual causality or dependent origination, amplifying feedback loops, resonance, and the web of life as they first appeared in early Buddhism and Daoism and are now shared by the contemporary philosophy of process and general systems theory. Thus, these concepts constitute an excellent philosophical and scientific meeting point not only of West and East, but also of North and South, because they can be found, in one form or another, virtually in all known civilizations on our planet. They have gained great relevance in our age, because the planetary framework of globalization implies different rules and principles of human interaction, which need equally to be remapped and reorganized at the local and regional levels.

Furthermore, human evolution itself has revealed the wisdom of the old sages who advised the rulers of their time to move from a warlike mentality and violent competition to mindful, peaceful and innovative coexistence with one another and with all other beings on our planet. The QR principle is in full consonance with this mentality of peace, which also implies a second-order ethical system. Unlike first-order ethics, in which one accords preferential treatment to one's own group, be it family, tribe, nation, religion, etc., the second-order ethics is based on the Golden Rule (treat all human and other beings as you would like to be treated yourself) and is, therefore, the most appropriate mode of thought and behavior to adopt within a planetary reference frame.

In Part Two of the book, we propose concrete, QR technology-supported, global solutions, in line with the QR principle and the ethical precepts of the *philosophia perennis*, in four essential fields: big-data mining and processing, commerce, healthcare, and global learning and research. In Chapter 5, we describe one of our most exciting QR applications, an interactive content search

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

and delivery engine, which we have called Q-Search and which renders obsolete the current Google and Yahoo/Microsoft search and transaction technologies. Indeed, it can revolutionize the whole field of intelligent, interactive management of information and content in real-time.

Q-Search is a problem-solving technological platform that operates broadly in three domains relevant to search issues. It excels at: 1) real-time content acquisition; 2) sophisticated real-time data processing with an emphasis on linguistic content analysis; and 3) on-demand query, computation, and delivery. In addition, Q-Search offers advanced monitoring and management tools to keep data centers aware of and provide flexibility in information, product and content offerings.

The most significant innovation of Q-search, however, is that it moves far beyond text and numbers. Unlike current search engines, which are text-based and still mostly static, Q-search can, for example, store and retrieve a moving image, a sound file, or a sequential recording of behavior, as a computable object through its QR time-series representation (that is, representing data as a sequence of objects over some time base). The ability of storing and retrieving such data as computable objects, rather than as fixed images or character strings, completely transforms the browsing experience.

The "browser" of the future will be a virtual world in which the user searches, finds, manipulates, and transforms objects, and not a simple text-based, data retrieval system. Q-Search technology can easily build the platform for this virtual world of content search, delivery and consumption models. Even more importantly, Q-Search can remember, preserve and dynamically track and record user-based frames of reference in order to reproduce the "world of the user" inside computers and databases, including the user's unique behaviors and interactions with his or her environment. By continuously estimating the users' future behavior and comparing it against their actual interactions, the QR-based search system becomes highly predictive in relation to the individual user, as well as to the totality of all recorded or known users. This feature will give us very early knowledge of unfolding trends, conditions, evolutions and potential risks, both individually and systemically. Most importantly, a user may be a person, group of persons (even temporarily constituted), machine, network of machines, and any combination thereof. In other words, Q-Search incorporates the full effect and advantage that QR provides from an ontological, epistemological, ethical and practical vantage point.

We employ Q-Search technology in the next three QR global applications that we describe in the remaining chapters of our book. Thus in Chapter 6, we propose a fully automated, global, commercial transaction-space. We have called this space the Global Value Exchange (GVE), because all of its operations and transactions are based on actual products and services, exchanged at their real

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

value on all the levels of commercial participation. The GVE system will be the first enabling technology that potentially unites all producers and consumers of any product and service, anywhere in the world, in one single, standardized, transaction space.

The main goals of the GVE are: 1) to reintroduce, in the emergent global economy, the fair exchange of actual goods and services of real value; 2) to create stability through the precise calibration of economic units and to remove different currencies or instruments that have different values in different places; 3) to remove the highly speculative edge and unnecessary intermediaries that charge exorbitant interest, leverage between creditors and debtors, and are generally oriented toward usurious practices. In this sense, the GVE automatically adopts and applies some of the basic principles of traditional commerce, based on fair and mutually advantageous trading and honestly earned profit.

In addition, GVE reduces economic inefficiency to a minimum and, therefore, produces the fairest value, taking into account all of the elements that unite a product or service offering with its consumer. Most importantly, for the first time in human history, the fundamental ethical principles belonging to the second-order ethics, which are the most appropriate within a planetary reference frame, will be inbuilt as automatic features of the global economic system. This system will be based on a truly free market, without governmental or any other outside intervention, and will be impervious to fraud, corruption, and abusive manipulation. It is self-organizing, self-governing and self-policing for the equilibrated benefit of all.

Thus, the GVE system can be seen as a result of a long evolutionary process and constitutes a new stage in human development, viewed within a global reference frame. Within the GVE system, the creation of products and services will become a co-evolutionary process, governed by natural feedback loops between producers and consumers. The GVE system will therefore generate a symbiosis between those who produce actual goods and services and those who ultimately consume them. With the help of this system, not only commercial transactions between producers and consumers, but also all other human interactions will be symbiotic and based on mutual benefit, rather than on greed, exploitation, and enslavement. While the GVE system will help prevent flight of capital, tax evasion, market protectionism, and abusive economic and financial practices in general, it will also help eliminate social conflict, including labor union and management disputes. It will naturally promote lucrative and wise investments of local and global capital, based on Real Value of goods and services, as well as social responsibility and solidarity throughout the world.

In turn, in Chapter 7, we describe the rationale and architecture of a fully automated and interactive center of medical diagnostic and genetic data on-line, which can be implemented at the planetary level. The center uses real-time,

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

health-record data, together with environmental and social data, as data stream, to continuously seed and energize its computational environment. Its technological medical platform, which we have called Zoe, will gather, process, and redistribute, under fully securitized conditions to protect individual privacy, medical knowledge produced through the treatment of millions of patients and genetic information generated by thousands of research institutes and laboratories throughout the world. Much has been done in the past few years in many disconnected projects all over the world in terms of capturing electronic health-records. But, Zoe integrates all of these technological advances in a globally arranged base, or prerequisite electronic environment, and builds up from there.

The full implementation of the project requires the sustained, long-term effort of intercultural teams of researchers in fields such as medicine and pharmacology, genetics, bioinformatics, data management systems, social science, ethics, statistics, health care, intercultural studies, environmental sciences, and so forth, to assist in collecting, evaluating, and organizing medical and genetic data from doctor's offices, hospitals, genetic research institutes and laboratories, medical libraries, national health-record offices, and so on. Once the system is fully implemented, it will greatly advance medical and genetic research, and it will also detect and address outbreaks of epidemics and/or bioterrorist attacks at their incipient stages.

In consonance with the Quantum Relations Principle, Zoe's data and methods of collection and analysis are based not only on the assumptions and practices of Western, allopathic medicine, but also on those of the major schools of so-called alternative medicine. Above all, Zoe is oriented toward preventive instead of "repair" medicine and places healthcare decisions in the hands of the individual patients, offering them the most effective, comprehensive, and integrated treatments.

Finally, in Chapter 8, we propose the implementation of a planetary network of Intercultural Centers of Integrative Knowledge, Technology and Human Development (ICIKs, for short). These centers are designed according to the Quantum Relations Principle and are fully capable of developing and operating the kind of global projects that we have described in this book. The overall mission of the ICIK network is to help re-orient the planet toward a peaceful human mentality and, consequently, toward healthy and prosperous, consensus-based communities, through introducing innovative and effective learning objectives and strategies that will allow them to meet the challenges and take full advantage of the opportunities of globalization.

In line with its mission, the ICIK network will: 1) train ethically and socially responsible political, business, cultural, and civic leaders and entrepreneurs for a global age; 2) promote intercultural research, learning, and dialogue in a local, regional and global context; 3) explore, propose and implement ways of devel-

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

oping new transdisciplinary and transcultural knowledge by integrating the latest research in scientific, humanistic and artistic fields and reorienting such knowledge toward hands-on social and economic problem-solving and creative innovation in the major domains of human activity; and 4) help enhance the contributions of each ICIK's regional communities to the global market by identifying the best ways of translating newly generated knowledge into economic, societal and cultural value. To fulfill its mission, the ICIK network has five categories of activities: intercultural research, education, consultancy, training and exchange.

The ICIK network has two main components: the Global Learning and Research Centers (GLRCs) and the Integrated Data Center (IDCs). These two components are closely linked and continuously coordinate their activities in a mutually reinforcing, symbiotic manner. Each ICIK will choose its own administrative chart and its own research, learning, training and other activities, according to the specific nature and character of the region in which it is located. Nevertheless, its activities must be in keeping with the general mission and objectives of the network and will be closely coordinated with the similar activities of the other ICIK members, in order to avoid duplication and ensure maximum effectiveness.

Once the initial, basic grid is built, other ICIKs or similar centers will emerge as nodes in a worldwide, self-organizing network that will cover the entire planet. It is absolutely essential that these centers should be politically and financially independent: they must not be run by any single government or multinational corporation, although they will cooperate with all public and private organizations, regardless of their ideological or political platforms, as long as such platforms will not be incompatible with the expressed mission and objectives of the ICIK network.

We should emphasize that all of the QR-based technology that we have described here is available and fully implementable today. Indeed, we are already using it actively in many complex applications in fields such as big-data news analysis, geopolitical and macroeconomic models, forensics, and dynamic investigations of holistic transdisciplinary relationships in "in–motion models." Naturally, we prefer to use supercomputers, super-cloud environments and massive parallel databases in order to unlock the power of the Quantum Relations Principle. But we can add substantial benefit by just using a pencil and paper to chart out a certain problem in QR terms. As Part Two of the present book will show, we begin by "writing down" the problem in QR conceptual language and diagrams, before we actually feed it into a supercomputer. We can thus gain superior knowledge and insight about a complex problem even before resorting to a machine to obtain a definitive solution. In our daily interactions

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

with clients from all over the world we demonstrate how consulting work can be successfully structured around the QR methodologies.

We must also emphasize, however, that our methodologies cannot be fully implemented on a massive, global scale without the intelligent, collective effort on the part of the networked global community and a great deal of vision and political will on the part of local, regional and world leaders. It is chiefly for this reason that we propose the implementation of the planetary network of Intercultural Centers of Integrative Knowledge, Technology and Human Development. Indeed, it is our dream and most fervent hope that the 21st century will be known to future generations as the Age of Global Learning, when humanity has finally renounced violent competition, greed, enslavement, and war and has taken the first, but decisive steps, toward planetary wisdom.

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Acknowledgements

The authors wish to express their gratitude to several academic and research institutions. First, our thanks go to the Romanian National Authority for Scientific Research, CNCS – UEFISCDI, which made this publication possible through a generous grant (Project number PN-II-ID-PCE-2011-3-0771).

Special thanks are also due to PatentPool GmbH and its head Dr. Heiner Pollert in Munich, Germany, for unwavering support in developing Quantum Relations into a successful technological solution for the 21st Century.

Mihai Spariosu would also like to thank the University of Georgia, at Athens, USA for granting several research leaves, so he could collaborate on this book with Mr. Hardy Schloer in Europe.

We are grateful to a number of friends, colleagues and students who have read this work in its various stages and have offered their kind comments or have helped with it in other important ways: James Anderson, Jason Cornez, Mikhail Epstein, Adela Fofiu, Vlad Jecan, Fateh Maouche, Mirca Pasic, Gheorghe Stefan and Konrad Wienands.

We would also like to thank Sorin Antohi, Chun-chieh Huang and Joern Ruesen for their generous advice and for including our book in their Reflections on (In)Humanity series, to the "Humanity" part of which we hope to bring a contribution; and Ms. Marie-Carolin Vondracek of V&R unipress who has competently and efficiently guided us through the pre-production and production phases of the book.

Last but not least, a very special acknowledgement is due to Philip A. Gagner for his valuable contributions to the QR concept over the years, and to this book in particular, in the area of mathematics and many other areas of science, as detailed in the Brief History of the Quantum Relations Principle, at the end of this volume.

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626

Part One.
The Quantum Relations Principle: Theoretical Foundations

© 2016, V&R unipress GmbH, Göttingen
ISBN Print: 9783847106623 – ISBN E-Book: 9783847006626