Proceedings of International Conference on Smart Computing and Cyber Security

More than four decades have passed since a human first set foot on the Moon. Great strides have been made in our understanding of what is required to support an enduring human presence in space, as evidenced by progressively more advanced orbiting human outposts, culminating in the current International Space Station (ISS). However, of the more than 500 humans who have so far ventured into space, most have gone only as far as near-Earth orbit, and none have traveled beyond the orbit of the Moon. Achieving humans' further progress into the solar system had proved far more difficult than imagined in the heady days of the Apollo missions, but the potential rewards remain substantial. During its more than 50-year history, NASA's success in human space exploration has depended on the agency's ability to effectively address a wide range of biomedical, engineering, physical science, and related obstacles—an achievement made possible by NASA's strong and productive commitments to life and physical sciences research for human space exploration, and by its use of human space exploration infrastructures for scientific discovery. The Committee for the Decadal Survey of Biological and Physical Sciences acknowledges the many achievements of NASA, which are all the more remarkable given budgetary challenges and changing directions within the agency. In the past decade, however, a consequence of those challenges has been a life and physical sciences research program that was dramatically reduced in both scale and scope, with the result that the agency is poorly positioned to take full advantage of the scientific opportunities offered by the now fully equipped and staffed ISS laboratory, or to effectively pursue the scientific research needed to support the development of advanced human exploration capabilities. Although its review has left it deeply concerned about the current state of NASA's life and physical sciences research, the Committee for the Decadal Survey on Biological and Physical Sciences in Space is nevertheless convinced that a focused science and engineering program can achieve successes that will bring the space community, the U.S. public, and policymakers to an understanding that we are ready for the next significant phase of human space exploration. The goal of this report is to lay out steps and develop a forward-looking portfolio of research that will provide the basis for recapitulating the excitement and value of human spaceflight—thereby enabling the U.S. space program to deliver on new exploration initiatives that serve the nation, excite the public, and place the United States again at the forefront of space exploration for the global good.

Corporate Foresight

The editors bring two terms, narrative and innovation, together in an interdisciplinary and interactive way. Narratives are ubiquitous and hold the potential to indicate future changes in politics, economies and markets. As “stressors” and stabilizers in organizations, narratives and changes in the consensus narrative indicate the need for strategic change or organizational stasis and may be utilized as a source for early recognition in strategic management. The use of narratives in management, however, makes it necessary to adopt a new perspective. This volume offers a polyphonic forum for the development of an interpretive approach towards business administration, strategic management, and entrepreneurship, by introducing instruments of semiotics, linguistics, narratology, and others.

This compilation, therefore, presents a comprehensive overview of scientific and industrial perspectives beyond the mainstream.

Leadership 2050

Whatever happens tomorrow depends less on prevailing trends and more on individual and collective decisions taken in the face of these trends. If the future is indeed the fruit of human desire, then we have the power to change it to organizational or personal advantage. In Creating Futures, Michel Godet has collected an impressive arsenal of the most effective methodologies for strategic planning. Godet maintains that with the right tools and attitudes, people can learn how to create futures. The book presents these planning methods with lively examples and illustrative and
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informative case studies. These include information technology in Europe, AXA Insurance, EDF (the French electrical utility), individual combat weapon (French military), and BASF and the agri-business environmental challenge. Creating Futures provides the tools managers, planners, and entrepreneurs need to anticipate change; avoid forecasting errors; avoid clichés and conventional thinking; and make sense of the concepts used in foresight, scenario building, and strategic planning.

Introduction to Anticipation Studies

On a mountainside in sunny Tuscany, in October 1989, 96 people from 23 countries on five continents gathered to learn and teach about the problems of managing contemporary science. The diversity of economic and political systems represented in the group was matched by our occupations, which stretched from science policy practitioners, through research scientists and engineers, through academic observers of science and policy. It was this diversity, along with the opportunities for informal discussion provided by long meals and remote location, that made the conference a special learning experience. Except at lecture time, it was impossible to distinguish the "students" at this event from the "teachers," and even the most senior members of the teaching staff went away with a sense that they had learned more from this group than from many a standard conference on science policy they had attended. The flavor of the conference experience cannot be captured adequately in a proceedings volume, and so we have not tried to create a historical record in this book. Instead, we have attempted to illustrate the core problems the participants at the conference shared, discussed, and debated, using both lectures delivered by the formal teaching staff and summaries of panel discussions, which extended to other participants and therefore increased the range of experiences reported.

Product Innovation Management

This book provides an impressive overview of emerging technologies, especially nanotechnologies and biotechnologies, and their prospective applications. It identifies and describes existing and potential markets for emerging technology-based applications, and projects scenarios for macroeconomic development based on these technologies. Integrated roadmaps for the development of a nano- and bioindustry are shown and policy measures and corporate strategies developed to advance these technologies. These measures are illustrated using roadmaps and policy case studies. The book combines a practical, comprehensive overview of the technical side of emerging technologies and their applications in various fields with an analysis of market developments and characteristics.

Narrative and Innovation

This book provides students and line managers in organizations with the means to create better scenarios and to use them to create winning business strategies. The book covers scenarios such as: economic outlooks; political environments; acquisitions; downsizing, and more.

Foresight & Strategy in the Asia Pacific Region

The book gives practical guidance for policy makers, analysts, and researchers on how to make the most of the potential of Foresight studies. Based on the concept of evidence-based policy-making, Foresight studies are common practice in many countries and are commonly understood as a supportive tool in designing future-oriented strategies. The book outlines approaches and experiences of integrating such Foresight studies in the making and implementation of science, technology and innovation (STI) policies at different national levels. It delivers insights into practical approaches of developing STI policy measures oriented towards future societal and technological challenges based on evidence drawn from comparable policy measures worldwide. Authors from leading academic institutions, international organizations, and national governments provide a sound theoretical foundation and framework as well as checklists and guidelines for leveraging the potential impact of STI policies.

Design Thinking for Strategy

Develops scenario planning methods in ways that link scenario analysis to improved decision making, engage time-poor senior decision makers, attenuate decision makers' tendency to deflect responsibility for bleak, negative scenario outcomes, and enhance causal analysis within scenario-storyline development. What if? Two of the most powerful – and frightening – words in business. Almost as bad as "I didn’t see that coming." Some things that transform the marketplace overnight come from nowhere. Some things that create potentially critical under-performance are genuinely unforeseeable. Sometimes it is impossible to predict how a change in an organizational strategy will play out. Some things and sometimes – but not many and not often. Decision makers in organizations face more and more complex and ambiguous problems that need to be addressed under time pressure – and the need for practical decision support has become essential. The range of methods in this book will enable you to be prepared, proactive, and resilient no matter what the future brings. Based on up-to-date academic research and years of application and iteration in the real world, this book, illustrated with examples of the value delivered in Europe, Australia, and the Middle East, will transfer practical skills in scenario thinking using step-by-step instructions. This thoroughly revised and expanded second edition introduces these new approaches in detail, with clear guidelines and examples to enable the reader to select and implement the most appropriate scenario method to suit the issue at
Scenario Thinking

Traditional strategy assumes stability and predictability. Today’s world is better characterised by turbulence, uncertainty, novelty and ambiguity - conditions that contribute disruptive changes and trigger the search for new ways of coping. This book aims to become the premier guide on how to do scenario planning to support strategy and public policy. Co-authored by three experts in the field, the book presents The Oxford Scenario Planning Approach (OSPA). The approach is both intellectually rigorous and practical. Methodological choices and theoretical aspects in practice are detailed in reference to the relevant literatures and grounded in 6 case studies the authors have been involved with. The book makes several contributions to the field, centred on how learning with scenario planning is supported by re-framing and re-perception; how this iterative process can be embedded in corporate or government settings, and how it helps those that it supports to do well in today’s world. The book is written in an accessible style and will be a useful introductory text as well as a useful guide for the more experienced scenario planning practitioner and scholar.

Theories of Change

Have you ever wondered why even large companies fail when faced with changes in their environment? Would you be surprised to learn that the average life expectancy of a Fortune 500 company is below 50 years? This book presents findings from 19 case studies of multinational companies such as Siemens, Volkswagen, General Electric, Philips and Deutsche Telekom. René Rohrbeck proposes a Maturity Model to assess how prepared a company is to respond to external (disruptive) change. He uses data from 107 interviews with board members, corporate strategists, innovation managers, and corporate foresight professionals to present and discuss best practices. Using illustrations to show the complex interaction of corporate foresight with other units such as innovation and strategic management, René Rohrbeck provides the reader with rich insights on how to make an organization agile and reactive towards change. For scholars this book proposes multiple hypotheses and frameworks for future research.

Agroecological Transitions: From Theory to Practice in Local Participatory Design

This book is intended to spark a discourse on, and contribute to finding a clear consensus in, the debate between conceptualizing a knowledge strategy and planning a knowledge strategy. It explores the complex relationship between the notions of knowledge and strategy in the business context, one that is of practical importance to companies. After reviewing the extant literature, the book shows how the concept of knowledge strategies can be seen as a new perspective for exploring business strategies. It proposes a new approach that clarifies how planned and emergent knowledge strategies allow companies to make projections into the uncertain and unpredictable future that dominates today’s economy.

Emerging Technologies for Economic Development

Today, it has become strikingly obvious that companies no longer operate in an environment where only risk return and volatility describe the business environment. The business has to deal with volatility plus uncertainty, plus complexity and ambiguity (VUCA); that requires new qualities, competencies, frameworks; and it demands a new mind set to deal with the VUCA environment in investment, funding and financing. This book builds on a new megatrend beyond resilience, called anti-fragility. We have had the black swan (financial crisis) and the red swan (COVID) - the Bank for International Settlement is preparing for regenerative capitalism, block chain based analysis of financial streams and is aiming to prevent the “Green Swan” -- the climate crisis to lead to the next lockdown. In the light of the UN 17 Sustainable Development Goals, what is required, is Theories of Change. Written by experts working in the fields of sustainable finance, impact investing, development finance, carbon divesting, innovation, scaling finance, impact entrepreneurship, social stock exchanges, alternative currencies, Initial Coin Offerings (ICOs), ledger technologies, civil action, co-creation, impact management, deep learning and transformation leadership, the book begins by analysing existing Theories of Change frameworks from various disciplines and creating a new integrated model - the meta-framework. In turn, it presents insights on creating and using Theories of Change to redirect investment capital to sustainable companies while implementing the Sustainable Development Goals and the Paris Climate Agreement. Further, it discusses the perspective of planetary boundaries as defined by the Stockholm Resilience Institute, and investigates various aspects of systems, organizations, entrepreneurship, investment and finance that are closely tied to the mission ingrained in the Theory of Change. As it demonstrates, solutions that ensure the parity of profit, people and planet through dynamic change can effectively address the needs of entrepreneurs and business. By exploring these concepts and their application, the book helps create and shape new markets and opportunities.

Corporate Foresight

This book develops foresight techniques to turn future societal challenges into opportunities. The authors present foresight approaches for innovation policy and management. Future developments in fields such as education, energy, new materials, nanotechnologies are highlighted for different countries. Readers will discover tools and
instruments to capture the potentials of the grand societal challenges as defined by the United Nations. This book is a valuable resource for researchers and scholars with an interest in foresight methods and gives practical hints for policy makers and managers to take account of the grand opportunities in their business and policy strategies.

Strategic Foresight

This book explores the importance of strategy and how to make it work in an environment characterised by constant change. With a specific focus on the Asia Pacific region, anticipated to become the epicentre of global economic activity, it offers insights into the optimisation of economic potential and social cohesion enabled by leaders, which is crucial to the global economy and living standards. It highlights sound foresight, strategic thinking and innovation as the critical underpinnings of successful business and provides a comprehensive guide to combining practice and theory to ensure successful strategies, from formulation to execution. The book also builds on the concepts of change, the purpose of business, foresight, strategic thinking, strategic planning and innovation to present a holistic view of how these essential elements can be integrated in practice. Combined with a special contribution by Chaly Ma, the CEO of Deloitte Asia Pacific, the book carefully balances professional and academic insights to optimally benefit its readers and will be of interest to industry practitioners, researchers and students alike.

Emergent Knowledge Strategies

What is the difference between a fire fighter and an architect? One deals with crises as they arise while the other is capable of building something that can withstand all weathers. Using this analogy, Architects of Change provides you with the tools to grasp, leverage and harness the dynamics that shape tomorrow’s markets. It encourages you to nurture an entrepreneurial mind-set to transform the way a business – or even an entire industry – operates. Tackling crucial topics related to geopolitics, creative destruction, fake news, resilience and creativity, this book gives you the tools to analyse your environment and future trends in order to reinvent the way you do business. It teaches you how to: • Identify actors of change • Conduct simulations about the future • Assess threats of political instability • Build a strategy for a profitable and sustainable firm amid ongoing uncertainty • Become an architect of change yourself. Containing original interviews with industry insiders, including a world-famous expert on brands and luxury, the former CEO of a major think tank, a thought leader from CISCO, the former chairman of the US National Intelligence Council, and a former chief political scientist of a large Asian bank, this book helps you to understand the type of imagination and creativity this business environment requires not only to survive, but thrive.

Technology Roadmapping for Strategy and Innovation

Technology roadmapping is a significant method to help companies gain orientation concerning future challenges. This work contains a description of technology roadmapping in four major parts, providing expert knowledge on framing/embedding of technology roadmapping, processes of technology roadmapping, implementing technology roadmapping and linking technology roadmapping to other instruments of strategic planning. The book provides a comprehensive survey of technology roadmapping since it contains papers by leading European, American and Asian experts, provides orientation regarding different methods of technology roadmapping and their interconnections, supplies readers with a compilation of the most important submethods, and embeds and links technology roadmapping in the framework of management research. This book aims at becoming the leading compendium on technology roadmapping.

Private Banking and Wealth Management Futures 2030

People are using the future to search for better ways to achieve sustainability, inclusiveness, prosperity, well-being and peace. In addition, the way the future is understood and used is changing in almost all domains, from social science to daily life. This book presents the results of significant research undertaken by UNESCO with a number of partners to detect and define the theory and practice of anticipation around the world today. It uses the concept of Future Literacy as a tool to define the understanding of anticipatory systems and processes – also known as the Discipline of Anticipation. This innovative title explores: • new topics such as Futures Literacy and the Discipline of Anticipation; • the evidence collected from over 30 Futures Literacy Laboratories and presented in 14 full case studies; • the need and opportunity for significant innovation in human decision-making systems. This book will be of great interest to scholars, researchers, policy-makers and students, as well as activists working on sustainability issues and innovation, future studies and anticipation studies. The Open Access version of this book, available at https://www.taylorfrancis.com/books/e/9781351047999, has been made available under a Attribution-NonCommercial-NoDerivs 3.0 IGO (CC-BY-NC-ND 3.0 IGO) license.

Private Banking and Wealth Management Futures 2030

This Open Access book presents feedback from the Territorial Agroecological Transition in Action – TATA-BOX research project, which was devoted to these specific issues. The multidisciplinary and multi-organisation research team steered a four-year action-research process in two territories of France. It also presents: i) the key dimensions to be considered when dealing with agroecological transition: diversity of agriculture models, management of uncertainties, polycentric governance, autonomies, and role of actors’ networks; ii) an operational and original
participatory process and associated boundary tools to support local stakeholders in shifting from a shared
diagnosis to a shared action plan for transition, and in so doing developing mutual understanding and involvement;
iii) an analysis of the main effects of the methodology on research organisation and on stakeholders’ development
and application; iv) critical analysis and foresights on the main outcomes of TATA-BOX, provided by external
researchers.

Recapturing A Future for Space Exploration

What kind of leaders will the world need over the next thirty-five years? How will our knowledge of leadership,
leadership development, and leadership education change? Leadership 2050 examines the issues, drivers, and
contexts that will most likely influence leaders in the coming decades.

BioFutures

The application of foresight to address the challenges of uncertainty and rapid change has grown dramatically in the
past decade. In that period, the techniques have been greatly refined and the scope has been broadened to
encompass future-oriented technology analysis (FTA) and more recently, the concept and practice of strategic
intelligence. FTA addresses directly the longer-term future through the active and continuous development of
visions, and pathways to realise these visions. It is increasingly seen as a valuable management and policy tool
complementing, and extending further into the future, classical strategy, planning, and decision-making approaches.
This book charts the development of FTA and provides the first coherent description and analysis of its practical
application and impact in the worlds of business, government, education and research in both advanced and
developing countries. It draws on papers addressing the application of FTA around the globe which were presented
at the Second International Seville Seminar in September 2006. The insights and practical experience will be
invaluable for company managers, government ministers and officials, researchers and academics with
responsibilities for effective planning and decision-making in an increasingly turbulent and unpredictable world.

Futures Thinking and Organizational Policy

This book engages the reader around different perspectives between forecasting and foresight in strategic design,
drawing insights derived from a futures study that can be applied in form of a design-inspired foresight approach for
designers and interdisciplinary innovation teams increasingly called upon to help envisage preferable futures.
Demonstrating this process in applied research, the book describes a 2016 Financial Services industry futures study
to the year 2030. An industry increasingly at risk in dealing with uncertainty, the Financial Services sector, is a core
pillar of economic activity in most markets, such as greater China, and inherent within are major drivers of change
linked to consumer behaviors, new technology and disruptive business models. While the financial services industry
exemplifies an ideal case for design-inspired foresight, the aims of this book are primarily to establish the
peculiarities between traditional forecasting applications and a design-inspired foresight visioning approach as
strategic design activities for selecting preferable futures. Underlining the contribution of this book is the value of
design futures thinking as a creative and divergent thought process, which has the potential to respond to the much
broader organizational reforms needed to sustain in today’s rapidly evolving business environment.

Foresight for Science, Technology and Innovation

This book presents high-quality research papers presented at the International Conference on Smart Computing and
Cyber Security: Strategic Foresight, Security Challenges and Innovation (SMARTCYBER 2020) held during July 78,
2020, in the Department of Smart Computing, Kyungdong University, Global Campus, South Korea. The book
includes selected works from academics and industrial experts in the field of computer science, information
technology, and electronics and telecommunication. The content addresses challenges of cyber security.

Deploying Foresight for Policy and Strategy Makers

This book presents the theory of anticipation, and establishes anticipation of the future as a legitimate topic of
research. It examines anticipatory behavior, i.e. a behavior that ‘uses’ the future in its actual decisional process. The
book shows that anticipation violates neither the ontological order of time nor causation. It explores the question of
how different kinds of systems anticipate, and examines the risks and uses of such anticipatory practices. The book
first summarizes the research on anticipation conducted within a range of different disciplines, and describes the
connection between the anticipatory point of view and futures studies. Following that, its chapters on Wholes, Time
and Emergence, make explicit the ontological framework within which anticipation finds its place. It then goes on to
discuss Systems, Complexity, and the Modeling Relation, and provides the scientific background supporting
anticipation. It restricts formal technicalities to one chapter, and presents those technicalities twice, in formal and
plain words to advance understanding. The final chapter shows that all the threads presented in the previous
chapters naturally converge toward what has come to be called “Discipline of Anticipation”

Future-Oriented Technology Analysis
Foresight is one of humanity's superpowers. We all use it every day, well or poorly, in a foresight-action cycle, to anticipate, create, and manage the future. Foresight professionals, anyone tasked to think about probable, possible, preferable, or preventable futures for others, often time horizon. Foresight is both a set of time-tested practices, and emerging models of adaptiveness and values, rooted in psychology and complex systems research. We owe it to ourselves, our teams, and our civilization to apply the best practices, models, and worldviews in this vital, exciting, and powerful field. The two books of The Foresight Guide, updated periodically by our team at Foresight University, help executives and students become foresight leaders, starting with themselves and their teams. Book 1 (this book), Introduction to Foresight, covers personal, team, and organizational foresight practices, and their great benefits and challenges. Book 2, Big Picture Foresight (Feb 2022), covers key 21st century models, trends, issues, opportunities, problems, and stories of societal and global adaptiveness, in a world of accelerating change and machine intelligence. Each book is available in both an abridged Executive Edition and an expanded Student Edition. The focus of each book is not just strategic foresight, which will make us more effective in our short-term strategy and actions, independent of our goals and values, but adaptive foresight, or the evidence-based goals, values and practices most likely to improve our personal and group adaptiveness, in any environment, over the long term. This Executive Edition is an ideal text for executives and leaders seeking to understand the vital field of foresight, and to apply it better for themselves, their teams, and in their organizations. Organizational foresight emerged in the mid-20th century, and spans twenty specialties in strategic management, yet it is still poorly understood by many executives and leaders. Read and apply this book, and realize your foresight superpowers.

Transforming the Future (Open Access)

Bringing together some of the world’s leading thinkers, academics and professionals to provide practitioners, students and academicians with comprehensive insights into implementing effective service innovation. This book presents service innovation holistically and systemically across various service areas, including health, education, tourism, hospitality, telecommunications, and retail. It addresses contemporary issues through conceptual and applied contributions across industry, academia, and government, providing insights for improved practice and policy making. Featuring cutting-edge research contributions, practical examples, implementations and a select number of case studies across several growth service industries, this book also includes examples of failed service innovation attempts in order to demonstrate a balanced view of the topic and to make clear the pitfalls to be avoided. Culminating in a suggested step-by-step guide to enable service organization’s managers to understand and implement the concepts of service innovation and manage its evolutionary processes effectively, this book will prove a valuable resource to a wide reaching audience including researchers, practitioners, managers, and students who aspire to create a deeper scientific foundation for service design and engineering, service experience and marketing, and service management and innovation. Includes endorsements from professionals in the field of service innovation.

The Research System in Transition

This book constitutes the proceedings of the 5th International Conference on the Internet of Vehicles, IOV 2018, which took place in Paris, France, in November 2018. This year’s theme was “Technologies and Services Towards Smart City”. The 21 papers presented in this volume were carefully reviewed and selected from 41 submissions. The papers are organized in topical sections named: IoV communications and networking; IoV clouds and services; vehicular modeling and simulation; and vehicular security and privacy.

Forward-looking External Search as a Driver for Innovation

This book offers new insights into the complex set of activities and decisions of product innovation management. It provides concepts, methods, and tools that can help accelerate the introduction of successful products to the market in an increasingly competitive and changing business landscape. It also offers examples and case studies, and it is the result of more than 20 years of study, research, and consulting carried out by the two authors in the field of innovation management. The book discusses the demanding challenges of product innovation and offers practitioners guidance on how to respond to these challenges. It presents a three-level framework (the innovation pyramid, which reflects the core components of a firm's innovation capability: first, intelligence - absorbing information and knowledge from the outside world by looking beyond the familiar territories of the current market, technology, and customers; second, discovery - exploring opportunities for innovation through creative ideation and technology experimentation; and third, development - transforming opportunities into profitable new products and services.

Growth Poles of the Global Economy: Emergence, Changes and Future Perspectives

This volume presents a timely recognition, warning and mapping of the fast approaching wave, or “bio-tsunami”, of global socio-technical transformation, built by a much wider spectrum of converging powers, including biotechnology, new agriculture, novel foods, health, quality of life, environment, energy, sustainability, education, knowledge management, and design of smart applications. The book contains eight sections corresponding to different clusters of bioeconomic and socio-technical change, as identified by the editors’ “Scanning the Horizon” foresight research; it also offers an integrated view of the future bioeconomy landscape through the convergence of
several technologies that affect everyday life. The clusters offer methodologies for forecasting the future bioeconomy, and how these predictions can affect target-setting and the orientation of policies and actions to manage cultural and societal change, and achieve sustainable development in less developed areas. The book will be of interest to researchers, producers, logistics experts, policy makers, regulators, business and financial institutions, and biotechnologists (e.g. geneticists, food experts, etc.).

**Strategic Reframing**

This book provides an overview of the basics of strategic foresight, the differences multinational enterprises (MNEs) have to deal with while working in an international context and an understanding of the interrelation of strategic foresight and environmental trends. The results of the study indicate that it is advantageous for MNEs to use their internal resources worldwide for strategic foresight during the first three phases of the strategic foresight process (SFP); but they have to be aware of possible barriers.

**The Handbook of Service Innovation**

This book draws on the author’s own experience as a practitioner, collaborations with professionals from small and medium-sized businesses with international scope in North Macedonia and Belgium, and academic research. Its goal is to bring together tactical management and information systems research in complex environments. By developing the "DENICA" managerial method it re-introduces tactics as an important managerial function and underestimated source of competitive advantage. The book also offers a roadmap for dynamic reconfiguration of the managerial systems in complex environment, while considering adaptability, sustainability and effectiveness in the process. Furthermore, the book introduces a methodological "kaleidoscope" which combines IS methodology with the managerial sciences, offering a model that can be adapted and replicated to specific contexts in order to achieve fitting solutions. Real-world case studies from North Macedonia and Belgium apply these methods and illustrate their practical implications.

**Science, Technology and Innovation Policy for the Future**

The book presents the best contributions from the international scientific conference “Growth Poles of the Global Economy: Emergence, Changes and Future,” which was organized by the Institute of Scientific Communications (Volgograd, Russia) together with the universities of Kyrgyzstan and various other cities in Russia. The 143 papers selected, focus on spatial and sectorial structures of the modern global economy according to the theory of growth poles. It is intended for representatives of the academic community: university and college staff developing study guides on socio-humanitarian disciplines in connection with the theory of growth poles, researchers, and undergraduates, masters, and postgraduates who are interested in the recent inventions and developments in the field. It is also a valuable resource for expert practitioners managing entrepreneurial structures in the existing and prospective growth poles of the global economy as well as those at international institutes that regulate growth poles. The first part of the book investigates the factors and conditions affecting the emergence of the growth poles of the modern global economy. The second part then discusses transformation processes in the traditional growth poles of the global economy under the influence of the technological progress. The third part examines how social factors affect the formation of new growth poles of the modern global economy. Lastly, the fourth part offers perspectives on the future growth of the global economy on the basis of the digital economy and Industry 4.0.

**Recent Developments in Foresight Methodologies**

This book proposes that organizational policies are what ensure the institutionalization and sustainability of futures thinking in organizations. It presents several case studies from corporations and other institutions that describe effective use of foresight methods and internal policies to respond to rapid change. The case studies address changing trends in technology, globalization and/or workforce diversity, and the impact on the economic and political well-being of the organization. The editors also develop an organizational capability maturity model for futures thinking as well as providing questions for discussion that promote critical review of each case chapter. This book will inform scholars and organizational leaders how best to utilize foresight methodologies and organizational policies to sustain successful management strategies within futures thinking organizations. Chapter 9 is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

**Multinational Strategic Foresight of Environmental Trends in the Automobile Industry Using Internal Resources**

This book examines the leadership practices and foresight needed for smart cities. The book begins by exploring the evolving definition of a smart city. Then, it considers the problems with smart cities and the need for foresight in the management of these cities. The last part of the book offers a model of strategic foresight based on understanding, anticipating, and shaping the future, with applicability to organizations. This book offers a new conception of smart cities that will appeal to researchers and policymakers interested in futures thinking and strategy.
Internet of Vehicles. Technologies and Services Towards Smart City

Have you ever wondered why even large companies fail when faced with changes in their environment? Would you be surprised to learn that the average life expectancy of a Fortune 500 company is below 50 years? This book presents findings from 19 case studies in multinational companies such as Siemens, Volkswagen, General Electric, Phillips and Deutsche Telekom. René Rohrbeck proposes a maturity model to assess how prepared a company is to respond to external (disruptive) change. He uses data from 107 interviews with board members, corporate strategists, innovation managers, and corporate foresight professionals to present and discuss best practices. Using illustrations to show the complex interaction of corporate foresight with other units such as innovation and strategic management, René Rohrbeck provides the reader with rich insights on how to make an organization agile and reactive towards change. For scholars this book proposes multiple hypotheses and frameworks for future research.

Tactical Management in Complexity

In this empirical analysis Sara Polier investigates forward-looking external search strategies and their impact on the value contribution of corporate foresight. Based on a mixed method approach combining a quantitative and qualitative analysis of large, R&D-intensive firms, the findings reveal a general positive influence of different search strategies with respect to the scope (i.e. breadth, depth, and distance) and direction of search (i.e. market, science, and intermediary-driven) on the role of foresight as a driver for innovation. This relationship is found to be mediated by a firm’s exploratory learning capability, which appears to facilitate the effective transfer of external future-related knowledge into valuable outputs.

Architects of Change

This book engages the reader around different perspectives between forecasting and foresight in strategic design, drawing insights derived from a futures study that can be applied in form of a design-inspired foresight approach for designers and interdisciplinary innovation teams increasingly called upon to help envisage preferable futures. Demonstrating this process in applied research, the book describes a 2016 Financial Services industry futures study to the year 2030. An industry increasingly at risk in dealing with uncertainty, the Financial Services sector, is a core pillar of economic activity in most markets, such as greater China, and inherent within are major drivers of change linked to consumer behaviors, new technology and disruptive business models. While the financial services industry exemplifies an ideal case for design-inspired foresight, the aims of this book are primarily to establish the peculiarities between traditional forecasting applications and a design-inspired foresight visioning approach as strategic design activities for selecting preferable futures. Underlining the contribution of this book is the value of design futures thinking as a creative and divergent thought process, which has the potential to respond to the much broader organizational reforms needed to sustain in today’s rapidly evolving business environment.

Leadership and Strategic Foresight in Smart Cities

Foresight is an area within Futures Studies that focuses on critical thinking concerning long term developments, whether within the public sector or in industry and management, and is something of a sub-section of complexity and network science. This book examines developments in foresight methodologies and relates its greater part to the work done in the context of the COSTA22 network of the EU on Foresight Methodologies. Foresight is a professional practice that supports significant decisions, and as such it needs to be more assured of its claims to knowledge (methodology). Foresight is practiced across many domains and is not the preserve of specialized ‘futurists’, or indeed of foresight specialists. However, the disciplines of foresight are not well articulated or disseminated across domains, leading to re-inventions and practice that does not make best use of experience in other domains. The methodological development of foresight is an important task that aims at strengthening the pool of the tools available for application, thereby empowering the actors involved in foresight practice. Elaborating further on methodological issues, such as those presented in the present book, enables the actors involved in foresight to begin to critique current practice from this perspective and, thirdly, to begin to design foresight practice. The present trends towards methodological concerns indicates a move from “given” expert-predicted futures to one in which futures are nurtured through a dialogue among “stakeholders.” The book has four parts, each elaborating on a set of aspects of foresight methodologies. After an introductory section, Part II considers theorizing about foresight methodologies. Part III covers system content issues, and Part IV presents foresight tools and approaches.

Introduction to Foresight, Executive Edition

European Business Schools tend to imitate their North American counterparts in an attempt to catch up in the worldwide competition for knowledge creation and training in management. Is this relevant? To what extent do business schools in Europe contribute to competitiveness of the economy? What will be the impact of new technologies, e.g. on executive education? Will there be a European job market for business professors? Will market forces win against state owned universities? The book compares the current institutional setting of business schools in various countries and presents five foresight scenarios for 2020.
The Future of Business Schools

The business environment is changing more rapidly than ever before, and new business ideas are emerging. This book discusses applying insights from design thinking to craft novel strategies that satisfy customer needs, make use of the available capabilities, integrate requirements for financial success and provide competitive advantage. It guides readers through the jungle encountered when developing a strategy for sustained growth and profitability. It addresses strategy design in a holistic way by applying abductive reasoning, iteratively observing customers and focusing on empathy, as well as prototyping ideas and using customers to validate them. Uniquely applying insights from design thinking to strategy, this book is a must-read for graduates, MBAs and executives interested in innovation and strategy, as well as corporate strategists, innovation managers, business analysts and consultants.

Creating Futures

Decision-makers at all levels are being confronted with novel complexities and uncertainties and face long-term challenges which require foresight about long-term future prospects, assumptions, and strategies. This book explores how foresight studies can be systematically undertaken and used in this context. It explicates why and how methods like horizon scanning, scenario planning, and roadmapping should be applied when dealing with high levels of uncertainty. The scope of the book moves beyond “narrow” technology foresight, towards addressing systemic interrelations between social, technological, economic, environmental, and political systems. Applications of foresight tools to such fields as energy, cities, health, transportation, education, and sustainability are considered as well as enabling technologies including nano-, bio-, and information technologies and cognitive sciences. The approaches will be illustrated with specific actual cases.