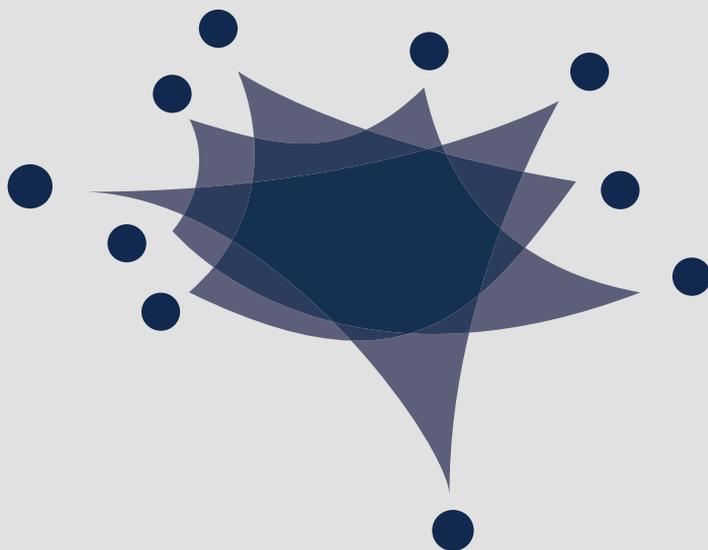


Economics of Communication

ICT Driven Fairness and Sustainability
for Local and Global Marketplaces



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ECONOMICS OF COMMUNICATION

**ICT DRIVEN FAIRNESS AND SUSTAINABILITY
FOR LOCAL AND GLOBAL MARKETPLACES**

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EDITORIAL

MOTIVATION OF THIS BOOK

Web and Internet technologies initiated the fourth industrial revolution in less than 20 years since their entry into mainstream communication scenarios, significantly changing economics and society. Digitization and mobile technologies accelerate communication and provide the tools to control value chains of ever increasing complexity. These value chains have long crossed the limits of single organizations or countries. Big Data, clustering and semantic technologies deliver increased precision in data analysis of electronic communication structures gathered via sensors and contextual analysis of everyday environments.

The ubiquitous flow of digital information empowers governments to track and analyze economic and social structures and adapt their legal systems accordingly, thus increasing their complexity making information technology a requirement to control them.

Economic success is dependent on rapid information exchange, real-time communication, and virtual market presence. These become critical success factors in the marketplace. Investment in digital solutions and communications accelerates growth and success in the marketplace. Digital communication channels increase information exchange inside and outside companies but may not necessarily also improve understanding of communication.

Social media replaces other digital communication systems and sometimes replace personal exchange particularly in a younger audience. The effectiveness of social media communications remains unclear.

Mobile payment solutions increase speed and transparency of financial transactions in an increasingly virtual financial marketplace. Will

further disconnection of the financial system from economic performance and our resources lead to loss of control over the real economic structure?

When countries lose influence on globalized digital markets, does the communication medium internet require its own, uniform legal and economic infrastructure? Will the web someday become a sovereign state? Who will control it and how will the separation of powers work?

The trend to centralization is back. Applications and data move into the cloud infrastructure. Software is no longer individually bought but rented under a limited access license in a closed ecosystem. Rights of use of data are transferred to cloud providers. How will these developments change our communication behavior?

New gadgets such as smart glasses, smart watches, smart wearables, and other companions change the way we communicate and interact. How do these changes influence economic circles?

THE CONFERENCE

All these questions initiated our first conference EcoCom in November 2013 that was carefully documented with additional media content at our website www.eco-com.net. The setting was created to discuss current approaches and demands for future research and development with the intention to promote research-oriented networking between participants.

With 8 international acclaimed speakers and an enthusiastic audience with 70 people contributing to discussions and open panels, the role of Information and Communication Technology (ICT) for sustainable economic development was discussed controversial and resulted with a lot of surprising ideas. After about 20 months of further research it came out that our EcoCom network created a connection between scientists from several disciplines investigating in driving technology forward with a broader view on problems around sustainability.

THIS BOOKS INTENTIONS

The dazzling display of creativity at the conference produced an open call for papers for this book to save, detail and systematize outcomes of this event and to invite investigators, community providers and interested scientists. It took a while to interest additional writers, for all authors to contribute, for reviewers to edit the articles, for authors to review and enhance their chapters, and for publishers to bring the product to fruition. The book was planned first as a mixed German-English version for the German scientific community. After reading all these brilliant and elaborated works, we decided to translate and publish them for a more global audience.

The book starts with two chapters that deal with the concept and interpretation of sustainability and the complex role of ICT. The impact of Jevon's paradox as a human behavior factor makes the first article a worthwhile read. Looking on the dimensions of sustainability, the second chapter more deeply describes the main pillars and proposes cyber-physical systems as a technology to support two main problems of mankind in a sustainable way.

A more tangible approach takes us into the supply chain of ICT industry itself in the third chapter. Reducing raw material input and increasing resource efficiency addresses the problem of limited mineral resource extraction and social factors. Research around the waste of electrical and electronic equipment is an example of how many questions have to be solved to overcome the economic status quo.

ICT sustainability does not come naturally. It has to be created by well-educated people and their knowledgeable contribution to mankind-saving projects. How does one become a passionate contributor to these projects? An approach to achieve competences through learning and experiencing is described in our fourth chapter. The human factor in this process has to be honored in this environment.

While game changing developments mostly start with research and entrepreneurship, we included three chapters (for this slightly German

centered book) dealing with regional investigations. The role of ICT in sustainability was evaluated in the startup economies around Berlin and the Silicon Valley. In chapter 5 the sustainability of ICT foundations in Berlin with hundreds of new micro-enterprises was investigated critically.

This chapter is accompanied by a master students paper, that was worked out as a reaction to chapter 5 in order to discuss questions around the impact of these increasing numbers of business start-ups and their turnover on the labor market especially.

ACKNOWLEDGEMENTS

At the end of this book project I'll thank several people that organized und contributed to EcoCom conference and to this book.

First of all Alcatel-Lucent Foundation for Communication Research was instigating us to bring a new topic on their agenda. Erich Zielinski and Heinz Friedmann were great partners in focusing the topic and organizing the grant from German »Stifterverband«.

Discussing and developing the conference format my friend and colleague Hans Mittendorfer from JKU Linz contributed a lot of ideas beside his nice presentation. In the same way I loved the discussions with Florian Brody, the entrepreneur and science contributor from Silicon Valley. It feels a delight to read, that his book article faces a lot of our communication topics now.

For their major conference contributions I also thank Jesse Marsh from Palermo, Matthias Trier from Copenhagen and Martin Klein from Los Alamos Labs. Unfortunately I could not convince these busy people to write an article for our book.

A very important part that made the conference such a communicating and pleasant event was its location. State of Saxony-Anhalt provided their Berlin Representation as a perfectly serviced and convenient pla-

ce. I personally thank Wolfgang Müllereleihle for hosting us and State Secretary Michael Schneider for his witty conference welcome address.

My Dean Michael Hoffmann with his colleagues was very helpful with major support from our department to the conference. It is Janine Rocosch that also gets our warm thank for organizational support with travel, social and other concerns.

The most and hardest work, and enthusiasm to get this conference project on the stage was done by my great organizing team members Ontje Helmich, Benjamin Hatscher, Christian Neumann, Johannes Stolz, Robin Krause and Adrian Wendt from SPiRiT research group. Thank you for your many many ideas, your cautiousness, pragmatism and leadership! It is a great experience to work with you in research, but was especially delightful in this conference project.

Also in putting together this volume I had invaluable help from my team. At the end this book was supported by Ontje Helmich, Florian Stiller, Lisa Umlauf and Benjamin Hatscher who were engaged in authors communication, typesetting, layout and publishing and who kept the project perfecting over a long period.

We all hope to provide some meaningful insights to our readers about the role of Information Technology for Sustainability. If you take action considering more aspects of sustainability effects in your daily work and research, this project might have achieved its objective. Thank you for telling others!

Michael A. Herzog