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Complex value system modelling reveals high risk structures in the ICT driven businesses.

Title of the dissertation
On Complex Value Systems in the Connected World
Kytkeyttäen maailman kompleksit arvoverkot

Contents of the dissertation
In this thesis, a qualitative complex value system model is developed and evaluated. The model studies the technical and operative structures, boundary conditions, and dynamic behaviors observed in the ICT-driven complex value systems. The research examines global mobile communications and internet value systems complemented by studies on emerging value systems of transportation in Finland. The complexities of the value systems are characterized in a systematic way, which can be used in scenario planning for new business development and in regulating the modern digital society. For instance, agent based dynamic modelling reveals insights to the sensitivity of the business system dynamics to the variable availability of scarce resources, such as radio spectrum for wireless communication. Social network analyses of the collaboration models in the related standardization organizations help to assess already in the early development phase the embedded risks of business failures in large multi-stakeholder communication networks. The holistic analyses including technical, commercial and social perspectives provide new possibilities to understand the challenges and opportunities in the emerging global data based and highly connected ICT driven business systems, such as those utilizing the emerging 5G mobile communications.

Field of the dissertation
Network economics

Doctoral candidate
Timo Ali-Vehmas, Master of Science (Eng.)
Born in Valkeakoski, 1956

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Opponent
Dr. Kaisa Still, Teknologian Tutkimuskeskus VTT Oy, Oulu, Finland

Custos
Professor Heikki Hämmäinen, Aalto University School of Electrical Engineering, Department of Communications and Networking

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Doctoral candidate’s contact information
Timo Ali-Vehmas, tel. +358 50 555 0760 timo.ali-vehmas@nokia.com

A doctoral dissertation is a public document and shall be available at Aalto University, School of Electrical Engineering, Maarintie 8, main hall at the latest 10 days prior to public defence.