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Revolutionizing Network Management: The Journey to AI-native Autonomy

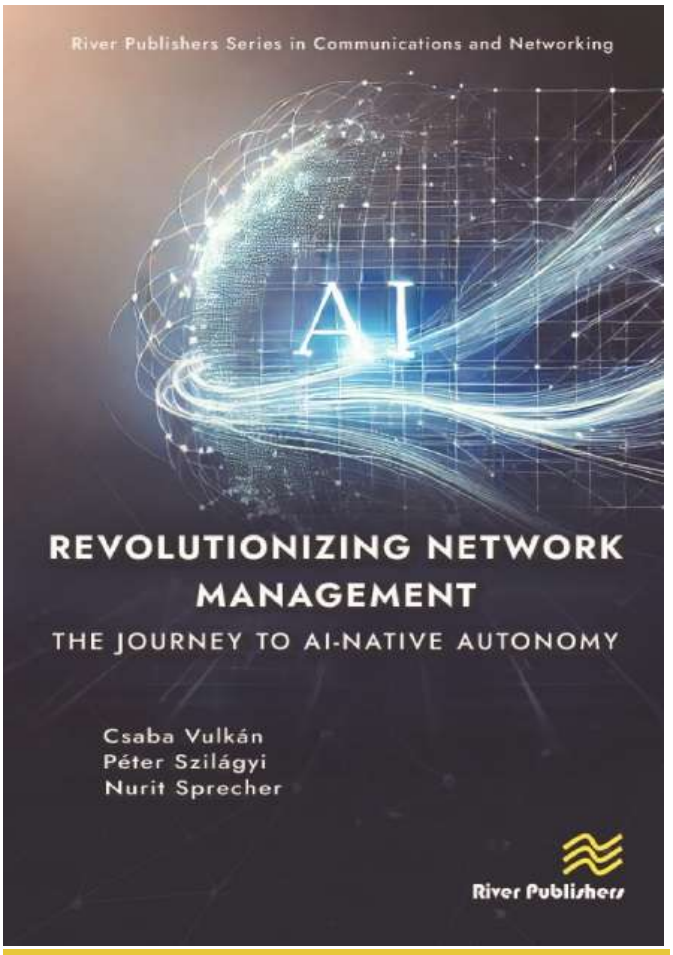
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End-to-end automation in telecommunications is a challenging yet critical industry objective, representing collective vision for technology evolution in the coming years. Key enablers for achieving this include the expression and the translation of high-level business goals (e.g. intents) into actionable and impactful operations, the deployment and interaction between closed loops, real-time data management, the extraction of meaningful insights from data, ML-driven analytics and intelligence, and seamless orchestration and resource control. Automation processes must be transparent, reliable and robust.

This book provides a comprehensive insight into the automation journey. It explores the vision of zero-touch, AI-native network and service autonomy, examining the key trends, catalysts, and technological advancements shaping this paradigm shift. It provides a comprehensive analysis of critical aspects such as data and knowledge management, security and trust, native AI/ML management, intent-based automation, and human-to-machine as well as machine-to-machine interfaces. By delving into advanced concepts such as data-driven, AI-powered analytics, semantic and decision models, network digital twins, and the role of natural language processing and large language models, the book bridges theory and practical application. It highlights how these innovations leverage and maximize intent-driven and closed-loop automation, enabling seamless, intelligent, and autonomous networks. Additionally, it identifies key areas where further research is needed to address existing gaps and unlock the full potential of these technologies.

Ultimately, this book provides valuable insights, outlining the transformative potential of zero-touch, AI-native networks and paving the way for seamless, intelligent, and autonomous management of networks and services, driving innovation, efficiency, and new opportunities in the evolving digital landscape.
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