Towards a New Digital Business Operating System
Speed, Data, Ecosystems, and Empowerment (Keynote)

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Abstract—We are living in the most exciting time in the history of mankind. The last century has seen unprecedented improvements in the quality of the human condition and technology is at the heart of this progress. Now we are experiencing an even bigger leap as we move towards a new level of digitalization and automation. Ranging from self-driving cars to factories without workers to societal infrastructure, every sensor and actuator is becoming connected and new applications that enable new opportunities are appearing daily. The fuel of this emerging connected, software-driven reality is software and the key challenge is to continuously deliver value to customers. The future of software engineering in this context is centered around a new, emerging digital business operating system consisting of four dimensions: Speed, Data, Ecosystems and Empowerment. The focus on speed is concerned with the constantly increasing rate of deploying new software in the field. This continuous integration and deployment is no longer only the purview of internet companies but is also increasingly deployed in embedded systems. Second, data is concerned with the vast amounts of information collected from systems deployed in the field and the behavior of the users of these systems. Software businesses need to significantly improve their ability to exploit the value present in that data. Third, ecosystems are concerned with the transition in many companies from doing everything in-house to strategic use of innovation partners and commodity providing partners. Finally, we need new ways of organizing work in this new, digital age. The keynote discusses these four main developments but focuses on the continuous software engineering. Also, the keynote provides numerous examples from the Nordic and international industry and predicts the next steps that industry and academia need to engage in to remain competitive.

Index Terms—Speed, data-driven development, software ecosystems, empowered organization.

I. BIO

Jan Bosch is professor of software engineering at Chalmers University Technology in Gothenburg, Sweden. He is director of the Software Center (www.software-center.se), a strategic partner-funded collaboration between 11 large European companies (including Ericsson, Volvo Cars, Volvo Trucks, Saab Defense, Jeppesen (Boeing), Siemens and Bosch) and five universities focused on software engineering excellence. Earlier, he worked as Vice President Engineering Process at Intuit Inc where he also led Intuit's Open Innovation efforts and headed the central mobile technologies team. Before Intuit, he was head of the Software and Application Technologies Laboratory at Nokia Research Center, Finland. Prior to joining Nokia, he headed the software engineering research group at the University of Groningen, The Netherlands. He received a MSc degree from the University of Twente, The Netherlands, and a PhD degree from Lund University, Sweden.

His research activities include evidence-based development, software architecture, innovation experiment systems, compositional software engineering, software ecosystems, software product families and software variability management. He is the author of several books including "Design and Use of Software Architectures: Adopting and Evolving a Product Line Approach" published by Pearson Education (Addison-Wesley & ACM Press) and “Speed, Data and Ecosystems: Excelling in a Software-Driven World” published by Taylor and Francis, editor of several books and volumes and author of a significant number of research articles. He is editor for Journal of Systems and Software as well as Science of Computer Programming, chaired several conferences as general and program chair, served on numerous program committees and organized countless workshops.

In the startup space, Jan is chairman of the board of Auqtus AB and, until recently, Fidesmo in Stockholm, Remente, in Gothenburg, Sweden. He serves on the board of Peltarion AB in Stockholm and on the advisory boards of Assia Inc. in Redwood City, CA and Burt AB in Gothenburg, Sweden. Finally, Jan runs a boutique consulting firm, Boschonian AB, that offers its clients support around the implications of digitalization including the management of R&D and innovation. For more information see his website: www.janbosch.com.