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Digital Transformation for a Sustainable Society in the 21st Century

18th IFIP WG 6.11 Conference on
e-Business, e-Services, and e-Society, I3E 2019
Trondheim, Norway, September 18–20, 2019
Proceedings



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Preface

This book presents the proceedings of the 18th International Federation of Information Processing (IFIP) Conference on e-Business, e-Services, and e-Society (I3E), which was held in Trondheim, Norway, during September 18–20, 2019. The annual I3E conference is a core part of Working Group 6.11, which aims to organize and promote the exchange of information and cooperation related to all aspects of e-Business, e-Services, and e-Society (the three Es). The I3E conference series is truly interdisciplinary and welcomes contributions from both academicians and practitioners alike.

The main theme of the 2019 conference was “Digital transformation for a sustainable society in the 21st century”. In line with the inclusive nature of the I3E series, all papers related to e-Business, e-Services, and e-Society were welcomed.

The digitalization process and its outcomes in the 21st century accelerate transformation and the creation of sustainable societies. Our decisions, actions, and even existence in the digital world generate data, which offer tremendous opportunities for revising current business methods and practices, thus there is a critical need for novel theories embracing big data analytics ecosystems. The value of digital transformations that emerges through big data analytics ecosystems is an area that is receiving increased attention. The multiple actors of such ecosystems (e.g., academia, private and public organizations, civil society, and individuals) need to cooperate or collaborate in order to develop the necessary capabilities that will lead to the creation of value, as well as to business and societal change.

We need digital business models that will not just be more accurate or efficient, but that will also go beyond economic value, and address societal challenges generating shared value that impacts the society as a whole and its relevant actors individually. Thus, it is important to recognize that value can emerge through different means and can be captured through different measures. Creating shared value or co-creating value can lead to increased benefits for all actors taking part in digital transformation.

I3E 2019 brings together contributions from a variety of perspectives, disciplines, and communities for the advancement of knowledge regarding “Digital transformation for a sustainable society in the 21st century”. Some organizations or entrepreneurs focus on driving business value and keeping ahead of competitors, while at the same time others can have a view of facilitating societal change, therefore generating value that impacts both them and the society overall. We call for research from different contexts that will contribute to the improvement of big data analytics ecosystems that emerge as drivers of digital transformation and sustainability. We seek to answer questions around the role of data actors, define data capacities and data availability, examine adoption at leadership and management level, and improve current approaches of data-driven sustainable development.

The Call for Papers solicited submissions in two main categories: full research papers and short research-in-progress papers. Each submission was reviewed by at least

two knowledgeable academics in the field, in a double-blind process. The 2019 conference received 138 submissions from more than 30 countries from almost all continents (i.e., Asia, Africa, Europe, North America, South America, and Australia). Out of the 138 submissions, 69 papers were selected to be presented at the conference. Four of the accepted papers were not included in the final proceedings because the authors decided to withdraw them. Thus, the acceptance rate was 47.1%.

Following the conference, two special issues have been organized for selected best papers from I3E 2019. The two special issues are on the *Information Systems Frontiers (ISF)* journal and the *International Journal of Information Management (IJIM)*.

The final set of 65 full and short papers submitted to I3E 2019 that appear in these proceedings were clustered into 13 groups, each of which are outlined below.

The papers appearing in Part I address the area of e-business. In detail, the papers present works in electronic commerce and social commerce. Furthermore, adoption of mobile applications and mobile commerce is examined. Finally, three papers deal with consumer reviews in online environments.

The papers appearing in Part II address big data and analytics. In detail, the works here deal with the business and social value that stem from big data applications, as well as challenges of adopting big data analytics. Further, a spatio-temporal model is proposed for improved analytics. Also, the relation of data science and circular economy is examined.

The papers appearing in Part III address open science and open data. In detail, the papers discuss applications of open data in private and public organizations, as well as open science as means to improve the design of laboratory forensics.

The papers appearing in Part IV address Artificial Intelligence (AI) and the Internet of Things (IoT). In detail, the papers include a bibliometric analysis of the state of AI in national security, the adoption of AI by public organizations, and an Internet of Things business model.

The papers appearing in Part V address smart cities and smart homes. In detail, different cases of smart city enablers and smart home adoption are discussed, along with ways to offer incentives for energy saving. Finally, a software management architecture for smart cities is presented.

The papers appearing in Part VI address social media and analytics. In detail, several papers examine the business value of social media and how employees use social media after work. Also, a social media information literacy construct is proposed. Furthermore, several papers focus on social media analytics for online interactions, user engagement, and digital service adoption.

The papers appearing in Part VII address digital governance. In detail, the adoption and co-creation of e-government services is examined. Furthermore, the issues of transparency, traceability, personal data protection, and digital identity are examined in the context of developing economies.

The papers appearing in Part VIII address digital divide and social inclusion. In detail, digital inequalities are examined along with ways to reduce them. Also, three papers investigate the role of technology for people with ASD and older adults. Finally, the effect of the sharing economy on social inclusion and subjective well-being is examined.

The papers appearing in Part IX address learning and education. In detail, the papers here deal with e-learning environments and online programming courses. Also, ways to improve multi-campus courses are discussed. Further, a literature review on how technology enhances organizational learning is presented.

The papers appearing in Part X address security in digital environments. In detail, the two papers in this part deal with cybersecurity in the era of digital transformation.

The papers appearing in Part XI address the modeling and managing of the digital enterprise. In detail, the papers discuss business value in SMEs, success factors for dynamic enterprise risk management, and structural requirements for digital transformation of enterprises. Also, the role of chief digital officers is discussed for successful digital transformation, while a maturity model approach is proposed for assessing digital transformation of enterprises.

The papers appearing in Part XII address digital innovation and business transformation. In detail, the papers discuss knowledge transfer in innovation ecosystems, customer behavior that may lead to digital disruption, and present a taxonomy for better knowledge organization within personal process management.

The papers appearing in Part XIII address online communities. In detail, here is discussed how students between two countries can gain more skills and knowledge via online collaboration. Also, the power of virtual social communities to fight crime is discussed.

In addition to the aforementioned papers, we were delighted to welcome Prof. Jan vom Brocke, Dr. Lillian Røstad, and Prof. H. Raghav Rao as our keynote speakers.

Dr. Jan vom Brocke is Full Professor of Information Systems, the Hilti Endowed Chair of Business Process Management, and Director of the Institute of Information Systems at the University of Liechtenstein.

Dr. Lillian Røstad is head of the Cyber Security Advisory in Sopra Steria, and is responsible for building up Sopra Steria's services within Cyber Security in Scandinavia.

Dr. H. R. Rao was named the AT&T Distinguished Chair in Infrastructure Assurance and Security at The University of Texas at San Antonio College of Business in January 2016. He also holds a courtesy appointment as full professor in the UTSA Department of Computer Science.

The success of the 18th IFIP I3E Conference (I3E 2019) was a result of the enormous efforts of numerous people and organizations. Firstly, this conference was only made possible by the continued support of WG 6.11 for this conference series and for selecting Trondheim to host it in 2019, for which we are extremely grateful. We received many good-quality submissions from authors across the globe and we would like to thank them for choosing I3E 2019 as the outlet to present and publish their current research. We are indebted to the Program Committee, who generously gave up their time to provide constructive reviews and facilitate the improvement of the submitted manuscripts. We would like to thank the Department of Computer Science and the Faculty of Information Technology and Electrical Engineering at the Norwegian University of Science and Technology (NTNU) for hosting and supporting the conference. Finally, we extend our sincere gratitude to everyone involved in organizing the conference, to our esteemed keynote speakers, and to Springer LNCS as

the publisher of these proceedings, which we hope will be of use for the continued development of research related to the three Es.

July 2019

Ilias O. Pappas
Patrick Mikalef
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