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# Responsible Design, Implementation and Use of Information and Communication Technology

19th IFIP WG 6.11 Conference on  
e-Business, e-Services, and e-Society, I3E 2020  
Skukuza, South Africa, April 6–8, 2020  
Proceedings, Part I



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# Preface

This book presents the proceedings of the 19th International Federation of Information Processing (IFIP) Conference on e-Business, e-Services, and e-Society (I3E 2020), which was held in Skukuza, Kruger National Park, South Africa, during April 6–8, 2020. The annual I3E conference is a core part of Working Group 6.11, which aims to organize and promote the exchange of information and co-operation related to all aspects of e-Business, e-Services, and e-Society (the three Es). The I3E conference series is truly interdisciplinary and welcomed contributions from both academics and practitioners alike.

The main theme of the 2020 conference was “Responsible design, implementation and use of information and communication technology.” In line with the inclusive nature of the I3E series, all papers related to e-Business, e-Services, and e-Society were welcomed.

The age of digital transformation opens up exciting new avenues for design and application of ICTs. Yet, with the ubiquitous connectedness of a digitally transformed world, come unintended, unpredictable, and often adverse consequences for individuals, societies, and organizations – in developed and developing contexts. Security, privacy, trustworthiness, exploitation, and well-being are some of the pressing concerns resulting from new digital realities.

There is need for responsible design, implementation, and use of information systems (IS) based on critical awareness and ethical practices. As rightly put by Schultze (2017:65): “As IS researchers we need to examine our own practices – including the questions we ask, the methods we deploy and theories we adopt – to understand and critically review our world-making.”

The IFIP I3E 2020 was held during April 6–8, 2020, and brought together contributions from a variety of perspectives, disciplines, and communities for the advancement of knowledge regarding responsible design, implementation, and use of information and communications technology. This was evident by our variety of keynote speakers and topics for the panel discussions. We were delighted to welcome three distinguished keynote speakers:

- Mr. James van der Westhuizen who is the founder and managing partner of KnowHouse, founded 20 years ago out of a passion to work differently with the challenge of learning and change in organizations. He is a global consultant and facilitator working across the African continent, the Middle East, Europe, and Asia.
- Prof. Irwin Brown is a full Professor and Head of the Department of Information Systems (IS) at the University of Cape Town. His research interests relate to theorizing about IS phenomena in developing countries.
- Prof. Dr. Shirish C. Srivastava is a tenured full Professor and holds the GS1 Chair on ‘Digital Content for Omni Channel’ at HEC Paris. His rich experience includes coaching senior executives on issues related to managing technology emerging technologies (such as big data, blockchains, and artificial intelligence), technology

enabled innovation, entrepreneurship, and managing cross-border business relationships.

The conference held two panels to facilitate discussions on important topics. The first panel on “Blockchain – hope or hype? Blockchain as a disruptive force” was chaired by Dr. Matti Mäntymäki. Blockchain is surrounded by considerable optimism and enthusiasm among businesses and academia. This enthusiasm is evidenced by the numerous calls for papers in journals and dedicated blockchain tracks in conferences. The purpose of the panel was to make sense of the actual significance of the blockchain phenomenon and provoke discussion and exchange of ideas among the I3E community. To this end, the panel paid homage to the heterogenous nature of the I3E community and invited a diverse group of expert panellists to share their distinctive perspectives on blockchain.

The second panel, made up of a panel of editors, was chaired by Dr. Shirish C. Srivastava. The panel consisted of six journal editors from international and local (South African) publications. Each editor gave an explanation on the requirements for authors when submitting to their journal.

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 2020 conference received 191 submissions. Out of the 191 papers, 91 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 it. Thus, the acceptance rate was 45.5%.

Following the conference, two special issues were organized for selected best papers of the I3E 2020. The two special issues are in the *International Journal of Information Management (IJIM)* and the *International Journal of Electronic Government Research (IJEGR)*.

The final set of 87 full and short papers submitted to I3E 2020 that appear in these proceedings were clustered into 14 groups, each of which are outlined below.

Part I: addressing the area of Blockchain. Three papers were grouped under this theme. One of the papers proposed a framework for the adoption of blockchain whilst another reported on the application of blockchain technology in Healthcare. The third paper examined the potential disruptive impact of cryptocurrencies.

Part II of the book addressed papers on the Fourth Industrial Revolution. Nine papers were grouped under this theme. Paper details range from a systematic literature review on the incompatibility of Smart manufacturing for SMMEs to the development of models and frameworks through the application of Smart technologies. One paper included a bibliographic coupling and co-occurrence on the topic of Smart City and Economy, whilst another reported on robotic automation and the consequences for knowledge workers. The final paper reported on the co-creation for digitalization in Norwegian business clusters.

Part III of the book addressed e-Business. 12 papers were grouped under this theme. The papers presented works on online banking quality, a conceptual framework for digital entrepreneurship, mobile applications, online switching behavior, and how games are used in business. Three papers reported on systematic review of literature on

eWOM, mobile shopping acceptance predictors and social commerce adoption predictors. The final paper presented a review of papers published from 2001 to 2019 by I3E.

Part IV of the book addressed Business Processes. 10 papers were grouped under this theme. The papers presented works on governance achieved through business process management, how IT is being used in Fintech Innovation, a meta model for maturity models, and a strategic model for the safeguarding the preservation of business value. In addition to these themes, papers were presented on using the story-card method for business process re-engineering, using Zachman's framework as an IS theory and a review of the Task-Technology Fit Theory.

Part V of the book addressed Big Data and Machine Learning. Seven papers were grouped under this theme. The papers presented work on using machine learning in the field of healthcare, data governance, using a deep learning neural network model to predict information diffusion on Twitter, and big data visualization tools.

Part VI of the book addresses ICT and Education. Seven papers were grouped under this theme. The papers presented work on mobile learning, new considerations for flipped classroom approach, and eModeration system considerations.

Part VII of the book addressed eGovernment. Six papers were grouped under this theme. The papers presented work on the use of social media in eParticipation, enterprise architectures in eGovernments, and eGovernment implementation framework. Other themes included were digital innovation in public organizations, implementation challenges in eProcurement, and a case from Ghana on the effects on National Health Insurance digital platform development and use.

Part VIII of the book addressed eHealth. Six papers were grouped under this theme. Papers presented work on the use of technology for diabetic patients, factors influencing community health workers, wearable devices, and a Twitter social network analysis of the South African Health Insurance Bill.

Part IX of the book addressed Security. Four papers were grouped under this theme. Papers presented work on cyber-harassment among LGBTQIA+ youth, online identity theft, cybersecurity readiness of e-tail organizations, and the ethics of using publicly available data.

Part X of the book addressed Social Media. Six papers were grouped under this theme. Papers presented works on a conceptual framework for media use behavior, metaphors of social media, credibility of online information (fake news), and problematic media and technology use.

Part XI of the book addressed Knowledge and Knowledge Management. Three papers were grouped under this theme. Papers presented work on knowledge transfer science education, a knowledge asset management implementation framework, and a conceptual knowledge visualization framework for knowledge transfer.

Part XII of the book addressed ICT for Gender Equality and Development. Nine papers were grouped under this theme. Papers presented work on the rural vs urban digital divide, socio-economic factors in Internet usage in Nigeria, and enablers and barriers of mobile commerce and banking services among elderly individuals. A methodology for addressing the second-level digital divide, gender equality in the ICT context, digital competence requirements, and the influence of culture on women's IT career choices were also presented.



Part XIII of the book addressed Information Systems for Governance. Four papers were grouped under this theme. Papers presented work on the use of machine learning on financial inclusion data for governance in Eswatini, ordinance-tweet mining to disseminate urban policy knowledge for smart governance, open technology innovation in healthcare services, and multi-stakeholder-centric data analytics governance framework.

Part XIV of the book addressed User Experience and Usability. Three papers were grouped under this theme. Papers presented work on the use of machine learning and eye tracking to predict users' ratings on the aesthetics of websites, a systematic review on designing for positive emotional responses in users of interactive digital technologies, and a methodology to compare the usability of information systems.

The success of the 19th IFIP I3E Conference (I3E 2020) 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 South Africa to host it in 2020, 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 2020 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 Informatics of the University of Pretoria for their support in enabling us to host this conference. Thank you to AfricaMassive that assisted us with all the logistical arrangements with hosting the conference in Skukuza located in the Kruger National Park. 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<sup>1</sup>.

February 2020

Marié Hattingsh  
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<sup>1</sup> Due to the global COVID-19 pandemic and the consequential worldwide imposed travel restrictions and lock down, the I3E 2020 conference event scheduled to take place in Skukuza, South Africa, was unfortunately cancelled.

# Organization

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